

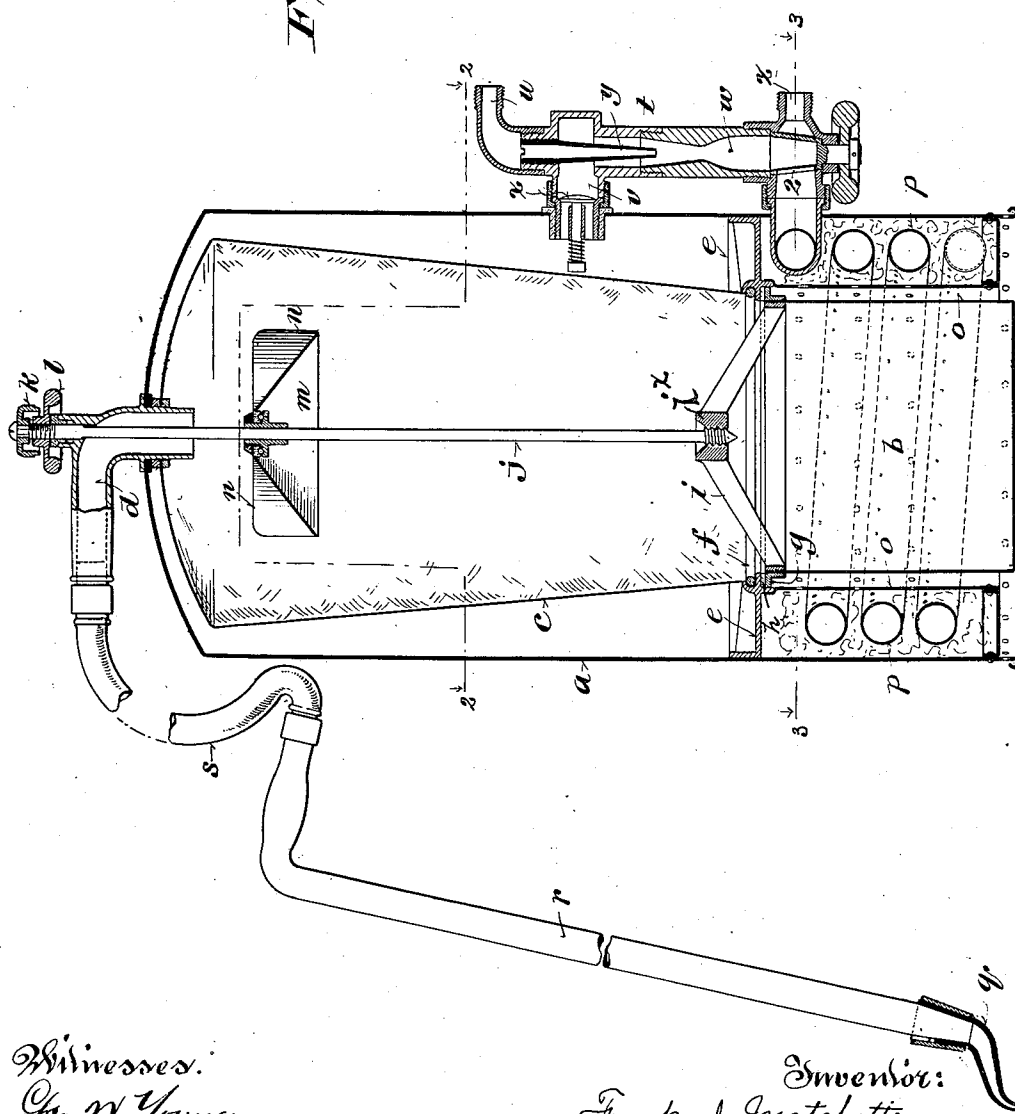
F. J. MATCHETTE.
DUST COLLECTOR.
APPLICATION FILED OCT. 16, 1904.

1,083,408.

Patented Jan. 6, 1914.

2 SHEETS-SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

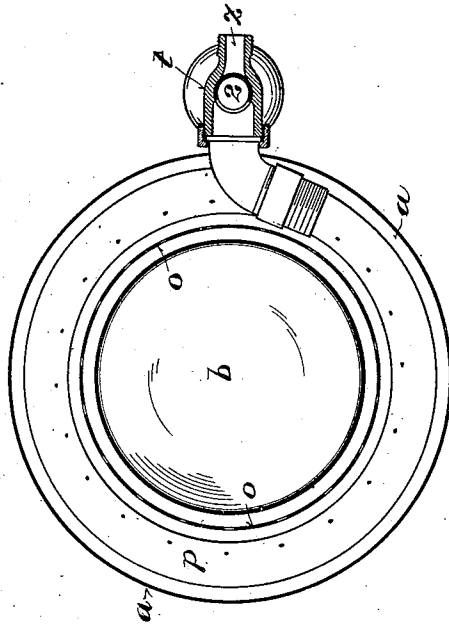
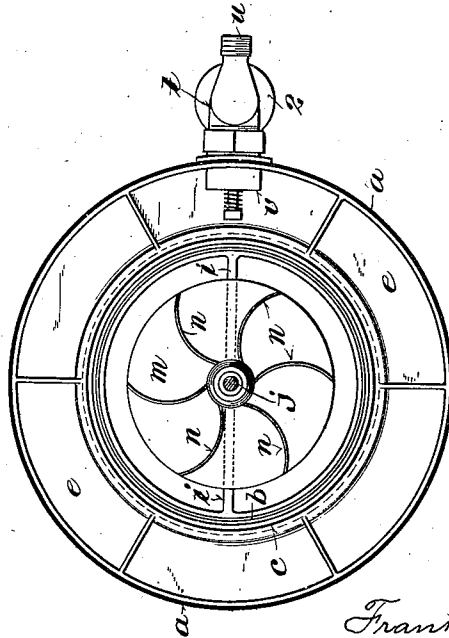


Fig. 2.



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UNITED STATES PATENT OFFICE.

FRANK J. MATCHETTE, OF MILWAUKEE, WISCONSIN.

DUST-COLLECTOR.

1,083,408.

Specification of Letters Patent.

Patented Jan. 6, 1914.

Application filed October 15, 1904. Serial No. 228,510.

To all whom it may concern:

Be it known that I, FRANK J. MATCHETTE, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates more particularly to apparatus in which dust and dirt are taken up and removed with a draft or current of air produced by a vacuum or partial vacuum. Its main objects are to avoid injecting the air blast by which the vacuum is produced and maintained into the dust laden air, and thus to reduce the volume of the air from which dust and dirt have to be separated and the area of the screen and the size of the separator required for such separation; to effectively prevent the air escaping from the ejector from making a noise; to utilize such escaping air, if desired, for light work, such as minor cleaning operations, and generally to improve the construction and operation of apparatus of this class.

It consists in certain novel features of construction and in the novel arrangement and combinations of parts hereinafter particularly described and pointed out in the claims. In the accompanying drawing like letters designate the same parts in the several figures.

Figure 1 is a vertical longitudinal section of apparatus embodying the invention, and Figs. 2 and 3 are horizontal sections of the dust-separator on the lines 2-2 and 3-3 respectively of Fig. 1.

The apparatus comprises generally a dust-separator which may be moved from place to place but is stationary relative to other parts of the apparatus; a portable suction head which has a flexible connection with the separator; and an ejector connected with the separator and having a compressed air supply connection arranged to produce a draft of air from the suction head through the separator.

The separator consists of an air tight case *a*, a dust-pan or receptacle *b* removably fitted in the base of the case, and a screen *c* inclosed by the case over the dust receptacle *b*. The case *a* may be conveniently made of sheet metal in cylindrical form, as shown. It is provided at the top with a pipe elbow *d* which communicates at its inner end with

the interior of the screen *c*. The screen, which may be conveniently made of cloth in the form of an inverted bag or hood open at the lower end, is attached at its upper end to the inner end of the elbow *d*. At its lower end it is secured to a ring *e* forming the bottom of the dust-separating chamber, by a split-wire ring *f* sprung into a groove in the ring *e*. The dust-receptacle *b* is provided at its upper edge with a rim *g* which fits into an annular recess in the under side of the ring *e*, and between which and the top of said recess a rubber gasket or packing ring *h* is interposed. It is also provided with a bail or cross-bar *i* having a central nut for engagement with a screw-threaded rod *j* which passes downward through the vertical limb of the elbow *d* into the separator and serves to secure the dust-receptacle in place therein, and to draw and hold its rim *g* tightly against the packing ring *h*, thereby forming an air-tight joint between said dust-receptacle and the dust-separating chamber. The nut *k* has a thread of steep pitch and a tapering opening at its upper end, and the rod *j* has a corresponding thread at its lower end which is pointed to facilitate its entry into said nut. At its upper end said rod is provided with a head *l* for screwing it into the nut *k*, and it is also formed next to said head with a screw-thread of less pitch and provided with a nut *m* having a corresponding screw-thread and a bearing upon a projection of the elbow *d* for the purpose of drawing the rim *g* of the dust-receptacle upward tightly against the packing ring *h*. Below the nut *m* the rod *j* passes through a stuffing box formed in the elbow *d* to prevent leakage of outside air into the separator and consequent lowering of the vacuum therein.

A deflector wheel *n* is rotatably mounted on the rod *j* just below the inner end of the elbow *d* and is provided with wings or blades *n* arranged to throw the dust and dirt carried with the incoming air against the screen *c*, thereby tending to agitate it and keep its meshes open.

Below the ring *e* an annular muffler chamber is formed by a perforated cylindrical wall *o* surrounding the dust-receptacle *b* a short distance therefrom. The bottom of this chamber is located a short distance above the lower edge of the separator case which is perforated, as shown, to permit the egress of air as hereinafter explained. In

this annular chamber a perforated spiral muffler pipe *p* is contained, with a loose packing of cotton batting, asbestos, or other sound-damping material. The lower end of this tube is closed and the series of small holes extending from one end of the tube to the other are preferably directed toward the inner perforated wall or partition *o*, through which the spent and purified air escapes into the space around the dust-receptacle *b*, thence downwardly and outwardly through the openings in the base of the case *a*.

q is a hollow suction head having a slot or aperture of any suitable size and shape for taking up dust and dirt from a carpet or other article to be cleaned. It is provided with a tubular handle *r* which is connected by a rubber hose or flexible pipe *s* with the elbow *d* at the top of the dust-separator, the hose being made of sufficient length to permit the suction head to be moved over any desired area without moving the separator.

An ejector *t* having a compressed air supply passage and connection *u*, a suction passage *v*, and a discharge passage *w*, is attached to the separator or connected therewith by its suction passage *v* which communicates with the space between the case *a* and the screen *c*, or on the opposite side of the screen from the dust inlet connection through the elbow *d*. The suction passage *v* is provided with a spring-seated check valve *z*, which opens outwardly with relation to the dust-separating chamber, and in case of accidental stoppage of the discharge passage of the ejector, prevents the air blast from entering the separator.

The ejector is provided with a nozzle *y* which is arranged when supplied with compressed air through the passage *u*, to entrain air through the suction passage *v* and discharge it through the passage *w*, thereby exhausting air from the separator around and through the screen *c*, and producing a draft from the suction head *q* and the hose *s* into the separator. To the lower or discharge end of the ejector is attached a T, one branch of which connects with the upper end of the spiral muffler tube *p*, the other branch *z* serving for the attachment of a hose or pipe to do light work with the exhaust air when desired. A two-way valve 2 is provided in said T for directing the air discharged from the ejector either into the muffler or through the branch *z*.

The apparatus herein shown and described operates as follows: The supply passage *u* of the ejector being connected with an air compressor or other source of compressed air, and air being admitted through said connection to the apparatus, a vacuum is formed in the dust-separator, thereby pro-

ducing a strong draft through the suction head *q* into the separator. The head *q* being moved over a carpet or other article to be cleaned, dust and dirt are taken up with the air and conducted into the separator inside of the screen *c*, through which the air freed from the dust and dirt passes the dust and dirt dropping into the receptacle *b* in the base of the separator. The dust-laden air as it enters the separator strikes the deflector wheel *m* whose wings *n* throw the particles of dirt and dust forcibly against the screen, thereby tending to agitate it and to keep its meshes open. The air which passes through the screen is drawn by the ejector through the suction passage *v*, opening the check valve *z*, and is forced through the discharge passage *w* into one end of the muffler tube *p*, from which it escapes through the numerous small holes therein without making a disagreeable noise.

The air freed from dust and dirt discharged with considerable force from the ejector, may be utilized for dusting or other light work by attaching a hose or pipe to the branch *z* and turning the valve 2 to cut out the muffler and to divert the air through said branch.

To empty the dust-receptacle or obtain access to the interior of the separator for cleaning or renewing the screen or for any other purpose, the nut *l* is loosened and the rod *j* is unscrewed from the nut in the bail *l*. The case *a* is then lifted and removed from the receptacle *b* and the screen *c* and other internal parts of the separator are accessible through the opening normally closed by said receptacle.

The screen may be removed for repairs or renewal by withdrawing the rod *j*, the head *k* and nut *l* at its upper end being first removed, unscrewing the lower nut on the inner end of the elbow *d* and removing the spring-wire ring *f* from the groove in the ring *e*.

By the construction and arrangement of parts herein shown and described it will be observed that the compressed air employed to operate the ejector and to produce a draft through the suction head into the separator is not injected into the dust-laden air, and that consequently the volume of air from which dust and dirt have to be separated is materially reduced. This is a great advantage since it renders it possible to materially reduce the size and weight of the separator and the area of the screen for removing the dust and dirt from the air with which it is taken up and conducted off through the suction head.

With the apparatus as herein shown and described, the air discharged therefrom after having done its work in taking up, conduct-

ing off and depositing in the dust-receptacle dust and dirt, may be utilized for dusting, light cleaning or other work that can be performed by a blast or jet of moderate force.

Various modifications in the details of construction and in the arrangement of parts may be made within the principle and intended scope of the invention.

10 I claim:

1. In a dust collector the combination with an air tight case provided with a dust receptacle and with inlet and outlet connections, an inverted strainer bag inclosed by said case over said receptacle between the inlet and outlet connections of the case in position to intercept the dust laden air in its passage from said inlet to said outlet, and a deflector wheel arranged within said bag in the path of the inflowing dust laden air to throw the dust against the sides of said bag, substantially as described.

2. In a dust collector the combination of a case provided with inlet and outlet connections and with a removable dust receptacle having an open top, an inverted strainer bag inclosed by said case over said receptacle between said inlet and outlet connections in position to intercept the dust laden air in its passage from said inlet to said outlet, said bag having an open bottom for the discharge of dust through the open top of said dust receptacle into the receptacle, and means for sealing the joint between said dust receptacle and case, substantially as described.

3. In a dust collector the combination of an air-tight case having an inlet and an outlet, a dust receptacle detachably secured in the lower part of said case by a screw rod passing through the top of the case and engaging a nut on said receptacle, a support for said screw rod, a screen inclosed by said case between its inlet and outlet and over said receptacle in position to intercept the dust laden air in its passage from said inlet to said outlet, and air exhausting means connected with the outlet of said case to cause a

draft of air through said screen, substantially as described.

4. The combination of a case having air inlet and outlet connections, a removable dust receptacle fitted in the lower part of said case to form an air tight joint therewith, and a bag or hood-shaped screen inclosed in said case over said receptacle and between said air inlet and outlet connections in position to intercept the dust laden air in its passage from said inlet to said outlet, said screen and dust receptacle being connected one with the other at the bottom of the screen and top of the receptacle, substantially as described.

5. A dust collector comprising an air tight case provided with an inlet, a perforated walled chamber beneath the air tight case provided with a perforated serpentine arranged pipe in communication with the air tight case, and a dust intercepting means located in the air tight case intermediate of its inlet and the point of communication between the case and said serpentine pipe to separate the dust from the air and prevent it from passing into the serpentine pipe, substantially as described.

6. A dust collector comprising an air tight case provided with an inlet, a perforated walled chamber beneath the air tight case provided with a perforated serpentine pipe in communication with the air tight case, means for creating a down draft of air from the air tight case through the serpentine pipe, and a dust intercepting means located in the air tight case intermediate of its inlet and the point of communication between the case and said serpentine pipe to separate the dust from the air and prevent it from passing into the serpentine pipe, substantially as described.

In witness whereof I hereto affix my signature in presence of two witnesses.

FRANK J. MATCHETTE.

Witnesses:

CHAS. L. GOSS,
JOSEPH F. KAMINSKY.