

I. H. SPENCER.
CLEANING APPARATUS.
APPLICATION FILED DEC. 17, 1917.

1,399,165.

Patented Dec. 6, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

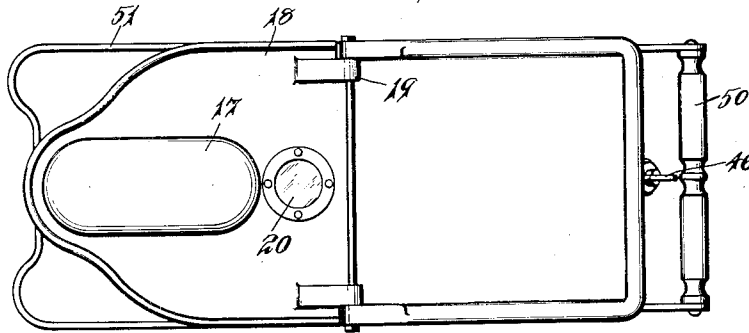


Fig. 2.

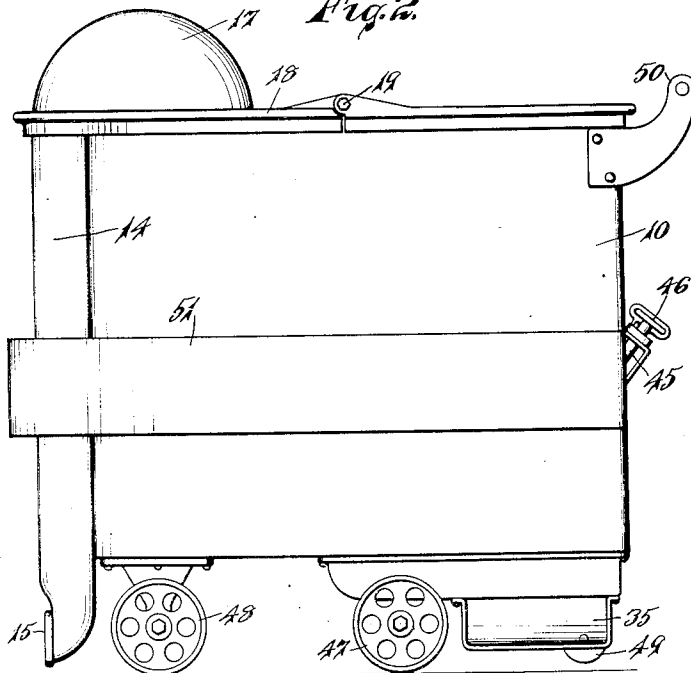
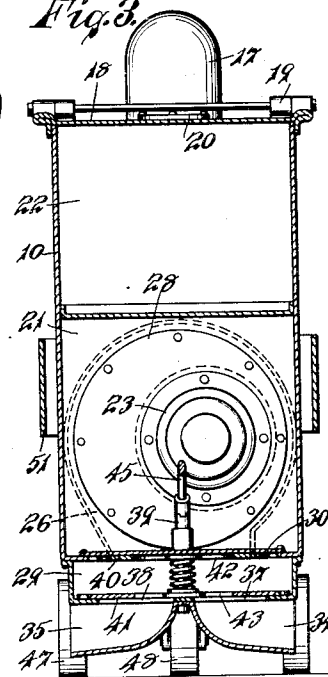


Fig. 3.



INVENTOR.

Ira H. Spencer.
BY *Arthur J. Jenkins.*
ATTORNEY.

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2 SHEETS—SHEET 2.

Fig. 1.

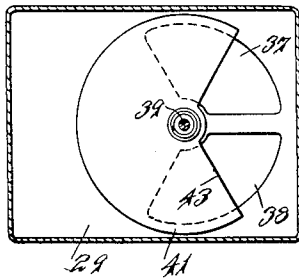


Fig. 4.

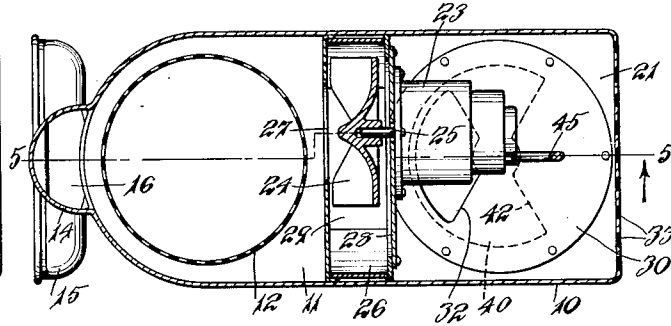


Fig. 6.

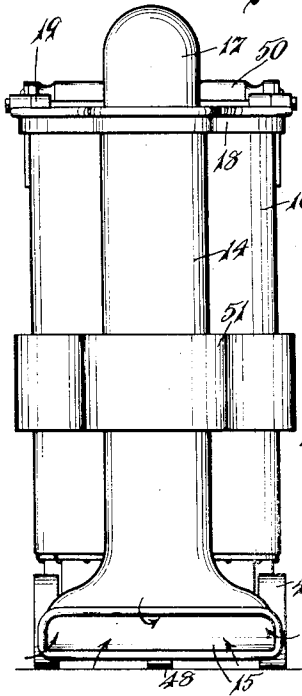
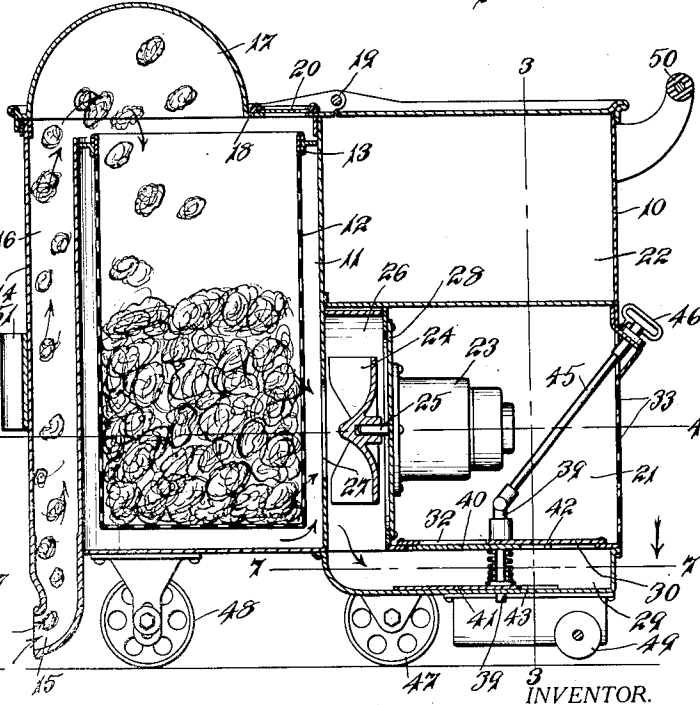


Fig. 5.



INVENTOR.
Ira H. Spencer
BY Arthur B. Jenkins.
ATTORNEY.

UNITED STATES PATENT OFFICE.

IRA H. SPENCER, OF WEST HARTFORD, CONNECTICUT, ASSIGNOR TO THE SPENCER
TURBINE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CON-
NECTICUT.

CLEANING APPARATUS.

1,399,165.

Specification of Letters Patent.

Patented Dec. 6, 1921.

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To all whom it may concern:

Be it known that I, IRA H. SPENCER, a citizen of the United States, residing at West Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Cleaning Apparatus, of which the following is a specification.

My invention relates to that class of cleaning apparatus more especially designed for removing material from floors by means of a current or currents of air, and an object of my invention, among others, is to provide an apparatus by means of which floors containing machinery or the like may be readily and effectively cleaned of material deposited thereon.

One form of 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 plan view of a cleaner embodying my invention.

Fig. 2 is a view in side elevation of the same.

Fig. 3 is a view in vertical cross section on plane denoted by dotted line 3—3 of Fig. 5.

Fig. 4 is a view in horizontal section on plane denoted by dotted line 4—4 of Fig. 5.

Fig. 5 is a view in vertical longitudinal section on plane denoted by dotted line 5—5 of Fig. 4.

Fig. 6 is an end view of my improved apparatus.

Fig. 7 is a view in section on plane denoted by dotted line 7—7 of Fig. 5.

My invention is especially applicable to an apparatus intended for cleaning floors of mills and factories where comparatively light material is employed for manufacturing purposes, such as is found in cotton and woolen mills, and to this end an apparatus especially designed for this purpose is illustrated in the drawings herein in which the numeral 10 indicates a case that is composed of any suitable material, preferably sheet metal, and that may be of any desired shape, said case having a receptacle compartment 11 at its front end, preferably round in cross section, and of considerable depth and that receives a receptacle 12 having perforations

through its wall, in the preferred form of construction this receptacle being made of wire-netting or similar material. A receptacle supporting ring 13 is secured to the walls of the compartment 11, this ring being somewhat smaller than the receptacle compartment so that a space is provided around the receptacle, that is preferably suspended from the ring by which it is removably supported.

An inlet tube 14 extends vertically along the front of the case, this tube having a mouth 15 at its lower end of substantial width, as shown herein this mouth being of a width substantially that of the case, the mouth narrowing into an inlet passage 16 through the tube 14, said inlet passage terminating in an arch-shaped delivery end located in an arch-shaped projection 17 formed on a cover 18 that is secured by a hinge 19 to close the upper end of the compartment 11 and the passage 16. This cover may be provided with an opening closed by a sight glass 20 through which the space within the compartment 11 and receptacle may be seen.

The rear part of the case is divided into motor and battery compartments 21 and 22 respectively, the motor compartment being preferably located near the bottom of the case and containing a motor 23 that may be connected with a battery located in the compartment 22 in any suitable manner. The construction and arrangement of this battery and its connection with the motor will be readily understood by those skilled in the art and for this reason further illustration of the battery has been omitted from the drawings herein.

A fan 24 is attached to the shaft 25 of the motor, said fan being located in a fan chamber 26 that communicates through an opening 27 with the compartment 11 and by means of which fan air is drawn from said compartment 11 into the fan chamber. The motor is preferably secured to a motor supporting plate 28 closing an opening between the fan chamber and the compartment 21. The center of the opening 27 and the axis of the shaft 25 are located preferably at one side of a plane passing vertically through the center of the compartments 11 and 21

so that the volume of air will be readily directed from the fan chamber into an outlet or exhaust chamber 29 located underneath the chamber 21.

5 A plate 30 closes an opening between the outlet chamber 29 and the compartment 21, this plate having a port 32 by means of which, in connection with a valve to be hereinafter described, air may be admitted
10 into the compartment 21 and out through perforations 33 in the rear wall of the compartment 21. Laterally opening exhaust passages 34—35 are located underneath the chamber 29, exhaust ports 37—38 opening
15 through the wall between the chamber 29 and said exhaust passages.

A valve shaft 39 is pivotally mounted in the walls of the chamber 29 and valves 40—41 are secured to said shaft, the valve
20 40 controlling flow of air through the port 32 and the valve 41 controlling flow of air through the exhaust ports 37 and 38. These valves, being secured to the shaft 39, are always maintained in definite relative positions, the valve 40 having a valve port 42
25 and the valve 41 having a valve port 43. These valve ports are so located in the valves and the valves are so located one with respect to the other that when the valve 40 is
30 positioned to permit flow of air into the chamber 21 the valve 41 will be positioned to prevent flow of air into either of the passages 34 or 35 and vice-versa. The port 43 is so arranged that air may be permitted to
35 flow simultaneously through both of the exhaust passages 34 and 35, or through one of said passages only, or through either of said passages, to a greater or lesser extent than through the other passage. As herein shown
40 the ports 42 and 43 each comprise substantially a third of the area of the valve in which it is located, and the valves 40 and 41 are secured to the shaft 39 so that these ports lie on diametrically opposite sides of
5 said shaft. The ports 37 and 38, with the dividing strip between them, each take up substantially one-third of the area within the circle defined by the outer edges of said ports and the port 32 comprises substantially
50 one-third of the area within the circle defined by the outer edge of said port, and this port 32 is located on the diametrically opposite side of the shaft 39 from the ports 37 and 38. It will be understood, however, that
55 the shape and sizes of these ports may be varied indefinitely without departing from the spirit and intent of the invention. As a means of operating the valves a rod 45 is pivotally attached to the shaft 39 and extends in a diagonal direction upwardly and
60 out through the back of the case where it terminates in a valve operating handle 46.

A main supporting set of wheels 47 is located at about the center of the case from

the front to the rear, the parts being arranged so that the greater part of the weight preferably is in front of a plane passing vertically through the axis of said wheels. Supporting wheels 48—49 are located respectively at the front and rear parts of the apparatus, and a handle 50 may be attached to the upper end of the case as a means for effecting and controlling the movement of the apparatus as a whole.

In the structure herein shown and described the battery and motor compartments are within a substantially rectangular shaped structure and the receptacle compartment is within a projection of substantially round form located in front of and secured to the
80 rectangularly shaped part of the casing. A fender 51 in the form of a metallic band is secured to the case and serves not only to rigidly support the projection containing the receptacle chamber, but also prevents
85 contact of the sides of the casing with machinery or other obstructions, and hence injury to the comparatively thin metallic casing is avoided.

The device is especially applicable to the
90 removal of light material, as cotton or wool, used in the manufacture of fabrics from the floors of mills, the apparatus being pushed along the aisles between the machinery. All of the material located in the path of movement of the apparatus will be readily taken
95 up through the mouth 15, and deposited in the basket or receptacle 12, the air passing from said basket into the compartment 11 and through the opening 27, this movement
100 of the air being caused by the fan 24. If the valves 40 and 41 have been located, as by means of the handle 46, in the position shown in the drawings, the air will pass from the chamber 29 through the ports 37
105 and 38 into and out of the exhaust passages 34 and 35. This will cause the material located at each side of the path of movement of the apparatus, and usually under the machines, to be blown away from the apparatus
110 and into the aisles adjoining that through which the apparatus is being moved and from which aisles the material may be readily removed by passing the apparatus along such aisles. If it be desired to blow the material
115 from one side of the apparatus only then the handle 46 may be operated to locate the valve 41 so that such blowing action may be had out through either exhaust passage as may be desired. If it is desired not to have the
120 material blown by the exhaust for air from the exhaust passages, then the handle 46 may be employed to locate the valves so that the ports into the exhaust passages 34 and 35 will be closed and the port into the chamber
125 21 will be open so that the exhaust will be through the chamber 21 and the perforations 33 in the rear wall of said chamber.

The ring 13 is imperforate as to that part outside of its central opening so that all air entering the chamber 11 must pass through the basket or receptacle 12. The location of this basket between the inlet 15 and the fan 24 causes all of the material which it is desired to save, to be deposited within the basket, and it is not torn or otherwise injured by being carried through the fan. Dust and dirt, however, that may pass through the meshes of the basket will be carried through the fan and thus separated to a certain extent from the material deposited within the basket. The inlet tube, as to its discharge end, that is that part located within the projection 17, is disconnected from the other part of the tube simultaneously with the lifting of the cover 18 to permit removal of the basket, and this feature comprises a portion of my invention embodied in the device forming the subject matter of this case.

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

I claim—

1. A cleaning apparatus comprising a portably mounted case having an inlet mouth in proximity with the surface to be cleaned, a device for creating flow of air located within the case, the latter having a motor compartment and an outlet chamber with a communicating passage between them and with outlet openings laterally from said chamber, a motor located in said compartment, and means for controlling the flow of air through said outlets and for diverting it through said motor compartment.

2. A cleaning apparatus comprising a portably mounted case having an inlet mouth in proximity with the surface to be cleaned, a device for creating flow of air located within the case, the latter having a receptacle compartment, a motor compartment and an outlet chamber with a communicating passage between them, outlet openings communicating with said chamber, and an inlet opening communicating with said receptacle compartment, a receptacle located in the receptacle compartment, a motor located in the motor compartment, and means for controlling flow of air through said outlets and for diverting the air current through said motor compartment.

3. A cleaning apparatus comprising a portably mounted case having an inlet mouth in proximity with the surface to be cleaned, and having a compartment therein, an exhaust chamber and outlets from said chamber, a device for creating flow of air located

within the case, and valves rigidly connected to control flow of air through said compartment and through said outlets and to shut off flow of air through either or a plurality of said passages.

4. A cleaning apparatus comprising a portably mounted case having an inlet mouth in proximity with the surface to be cleaned, and having a compartment therein, an outlet chamber underneath said compartment and outlets opening laterally from said chamber, the latter having ports through different walls, a device for creating flow of air located in said case, and valves rigidly connected to control flow of air through said ports and to shut off the flow of air through any or a plurality of said ports.

5. A cleaning apparatus comprising a portably mounted case having an inlet mouth in proximity with the surface to be cleaned, and having a receptacle compartment therein, a motor compartment, an outlet chamber, outlets opening laterally from said chamber, and an outlet communicating with the receptacle compartment, a device for creating flow of air located within the case to cause air currents through said receptacle compartment and into the outlet chamber, the latter having ports through different walls, valves rigidly connected to control air currents through said ports and to shut off flow through any or a plurality of said ports, and means for operating said valve.

6. A cleaning apparatus comprising a portably mounted case having an inlet mouth in proximity with the surface to be cleaned, a device for creating flow of air located within the case, the latter having a motor compartment, an outlet chamber with ports through different walls thereof, and outlets opening laterally from the case and communicating with said chamber, a motor located in said compartment to operate said device, valves located to control flow of air through either or a plurality of said ports, a valve operating rod extending from the valves through said chamber to the outer portion of the case, and means for operating said rod.

7. A cleaning apparatus comprising a portably mounted case having a motor compartment in the main part thereof, an outlet chamber located underneath said compartment, a fan chamber located in front of said compartment and communicating therewith, and outlets opening laterally from the case and communicating with said outlet chamber, said case also containing a receptacle compartment located in front of said fan chamber and in communication therewith, a receptacle removably located in said receptacle compartment, said case having an inlet opening communicating with the receptacle compartment at the top thereof, a

fan located in said fan chamber, and a motor located in the motor compartment and operatively connected with said fan.

8. A cleaning apparatus comprising a case with an inlet thereto and a plurality of exhaust outlets therefrom, means within the case for creating a flow of air through said

inlet, into the case and through said outlet out from the case, and means arranged for manual operation to control flow of air through said exhaust outlets and arranged to control the flow of air simultaneously through a plurality of said exhaust outlets.

IRA H. SPENCER.