No. 663,943. Patented Dec. 18, 1900.

J. S. THURMAN.

CARPET RENOVATOR.

(Application filed Dec. 18, 1899.)

(No Model.)

Fig. 1.

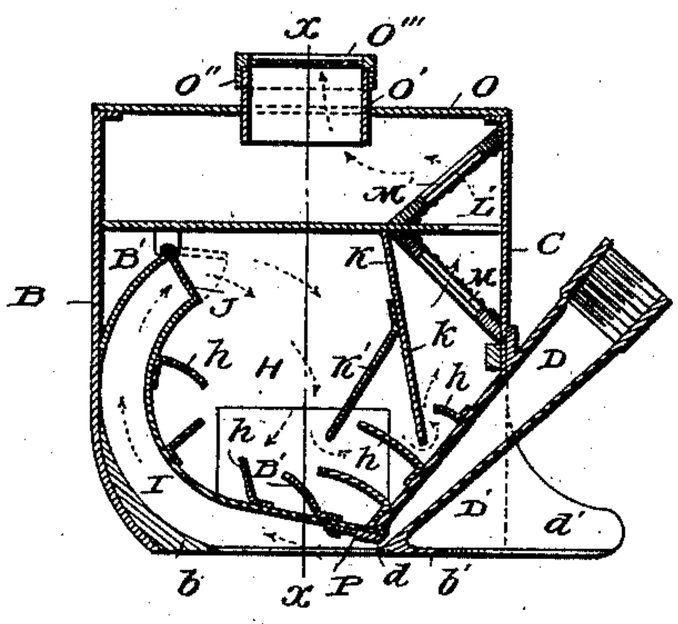


Fig. 2.

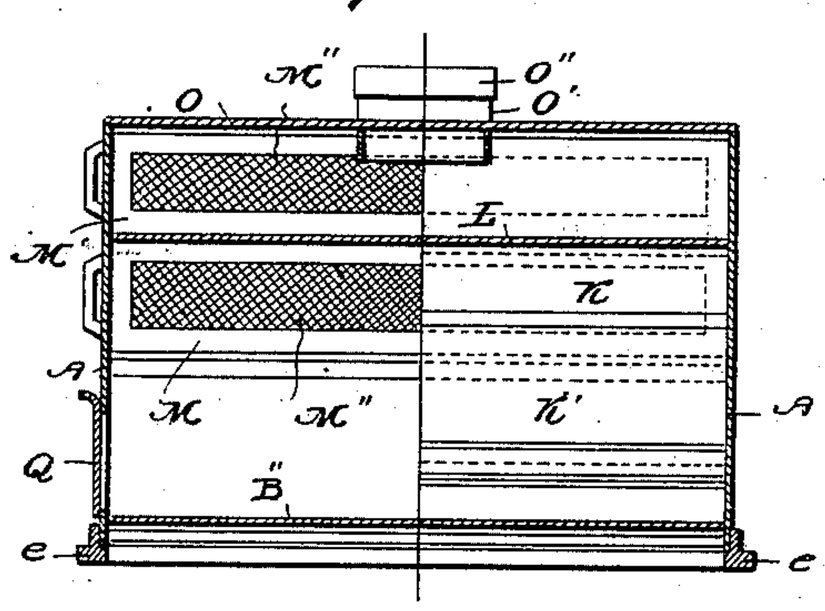


Fig. 3.

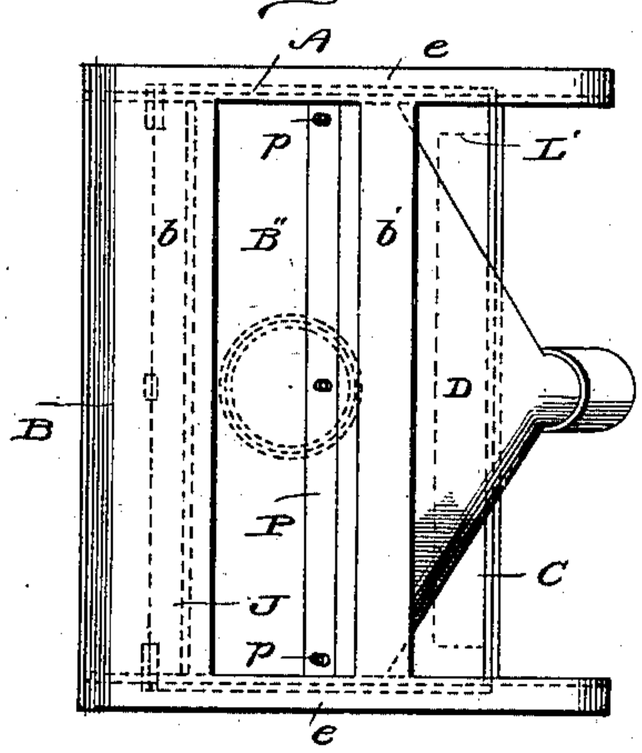


Fig. 4.

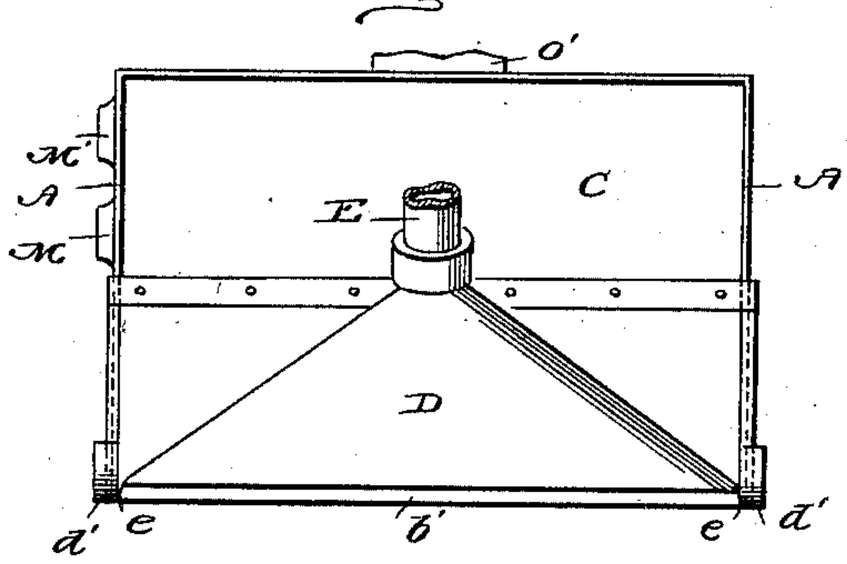
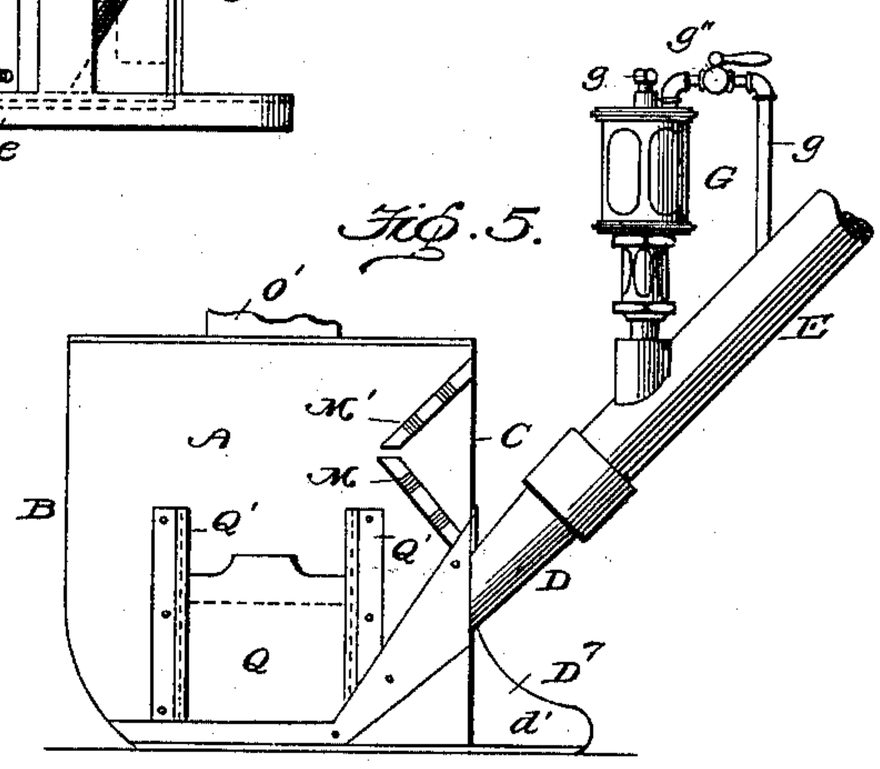


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN S. THURMAN, OF ST. LOUIS, MISSOURI.

CARPET-RENOVATOR.

SPECIFICATION forming part of Letters Patent No. 663,943, dated December 18, 1900.

Application filed December 18, 1899. Serial No. 740,735. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. THURMAN, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Carpet-Renovators, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a cross-sectional view through my improved carpet-renovator. Fig. 2 is a longitudinal sectional view of the same on line *x x*, Fig. 1, and in which the right-hand side shows the deflector-plates and the left-hand side of the same view shows the deflector-plates removed. Fig. 3 is a bottom plan view of the renovator. Fig. 4 is a rear elevational view, a portion of the cap being broken away; and Fig. 5 is a side elevational view of the device with the cap broken away.

This invention relates to a new and useful improvement in carpet-renovators, the object being to construct a device of the character described in a simple and cheap manner, whereby carpets may be thoroughly renovated and cleaned with compressed air without removal from the floor.

In addition to cleaning carpets without removal from the floor another object of my invention is to provide means whereby the carpets may be effectively fumigated or disinfected by providing a suitable cup from which the disinfectant is drawn into the air-supply, which thoroughly atomizes it and blows the same under pressure into the carpet, thus destroying disease and other germs.

In operation the box-shaped device, whose novel construction forms the basis of this present application, is arranged on the end of a flexiblee hose leading from some suitable source of compressed-air supply. The air is so introduced as to be projected at an angle onto or into and through the carpet for the purpose of collecting the dust, dirt, &c., after which the dust-laden air is conducted into a suitable chamber having a series of skimmers for clearing the air of its heavier foreign particles. The air, with its lighter particles of dust, is then forced under a series of deflecting-plates, forming a tortuous passage, and then through a series of screens, which tend to relieve the air of dust, which is lighter than the air, the clarified air finally escaping through the top of the collector in practically a purified state into the room.

The supply of air for the device illustrated in the drawings may be stored in tubes rolled of a solid billet of steel in the shape of a bottle, into which is pumped air under a high pressure of from two to four thousand pounds per square inch, said tubes or bottles being filled at a central plant and unloaded at the residence where the carpets are to be cleaned. On the neck of the bottle may be attached a reducing-valve to reduce the high-pressure air in the bottle to about eighty pounds per square inch. On the reducing-valve may be attached the air-hose, which is carried into the house, and on the end of the hose is attached the dust-collector. The bottle of air at the high pressure stated has sufficient quantity stored to accomplish the result desired, or compressed air may be supplied from a portable air-compressor, so that by connecting a flexible hose to the reservoir of said compressor the renovator may be operated in a dwelling or other house conveniently without further disturbing the compressor.

I have found from observation of a machine with which I have conducted experiments that the renovator relieves and collects nearly all, if not all, of the dust and dirt from the carpet over which it has traveled.

My invention consists in the construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings, A represents the side walls of the casing, which are preferably parallel to each other and connected by the end walls B and C. The end wall C, which is at the rear end of the casing, extends downward to the blast-nozzle D, then inwardly at an angle, forming a part of said nozzle, and connects with the inner wall B″, which forms the inner chamber. The blast-nozzle D is arranged at an angle and receives in its rear end pipe E, on the end of which is attached a suitable handle and valve through which compressed air is conducted to the nozzle. The mouth of the blast-nozzle D is contracted, as shown at

d, said mouth being continuous and extending practically the width of the casing. The width of the opening of the mouth of the nozzle is made adjustable by means of a plate P, having screws *p* in wall B″, passing through slots in said plate P.

The handle end of the pipe E carries the controlling-valve, (not shown,) which is within convenient reach of the operator, so that the operator can control the strength of the blast of air projected through the nozzle D.

To the rear end of the operating-handle is connected a flexible hose which leads from any suitable source of compressed-air supply.

It is preferable to make the nozzle D, with its runners *d*′ and base *b*, *b*′, and *e*, of a solid piece, preferably a casting, (designated as D′.) I prefer to flatten the flange *b*, *b*′, and *e* of casting D′, so as to increase the area of the bearing-surface of this casting at its point of contact with the carpet to make as tight contact at this point as possible. The runners *d*′ on the rear end of the casting D′ prevent the renovator from tipping rearwardly when being operated. The balance of the machine is preferably made of sheet metal.

The front end wall, before referred to, is curved rearwardly or inwardly at its lower end and is there attached to the frame or casting D′. At this point it receives the dust-laden air against its inner face, directing said air as indicated by the arrows.

B′ indicates an inwardly-projecting wall, forming, practically, a continuation of the curvature of the lower end of wall B, the function of which wall B′ is to direct the dust-laden air inwardly into the dust-collecting chamber H. The bottom wall of chamber H is formed by the plates C and B″, the former bending downwardly and inwardly, forming the upper wall of the nozzle D, while the latter curves upwardly and inwardly to conform to the curvature of the lower end of the front wall, but leaving, of course, a suitable space for the passage of the dust-laden air. I have lettered this space I in the drawings. The upper end of this space is closed by an inwardly-opening flap-valve J, which is pivoted at its upper end to wall B′. In operation the valve J is raised in proportion to the volume of the dust-laden air entering chamber H and tends to deflect the dust-laden air inwardly and downwardly in said chamber, as indicated by the arrows, so that the dust-laden air is given somewhat of a whirling motion, whereby the particles of dust in the air are thrown downwardly by centrifugal action and deposited in the bottom of the chamber. The skimmers *h* prevent the dust from whirling, and the air is retarded by expansion while whirling in this chamber sufficiently to allow the dust to settle under or against the said skimmers, which extend the full width of the chamber.

L indicates a wall or partition located above the flap-valve J and forming a chamber N, having an inlet-opening at L′, through which the purified and partly-purified air passes.

M and M′ are screens or slides arranged one above the other in such a manner that the partially-purified air will pass through said screens and through the said opening L′. These slides or screens are made of metal, preferably rectangular in shape, with an opening in the center, over which is attached a very fine netting M″. A piece of cotton or woolen cloth is also preferably used over the openings and in conjunction with the screens, so that the air in passing through these screens is relieved of that dust which is lighter than the air and which is inclined to escape through the exit-opening. One of the side walls of the casing is formed with suitable slots, through which one end of the screens passes, (see Figs. 2, 4, and 5,) the projecting ends of the screens affording a handhold by which they may be grasped and removed for cleaning purposes. Cleats are arranged on the back wall C and on the partition-wall L for holding the screens in place in the machine.

K indicates an inverted-**Y**-shaped deflector secured to the partition L and extending downwardly at right angles to said partition. The members of this deflector I have marked *k* and K′, and they preferably extend the full width of the chamber H.

The top of the renovator is made of a piece of sheet metal O, in which is secured the tube O′, one-half of the tube extending inside of the renovator and one-half outside of the renovator, and on the top of this tube is a removable cap O″. The upper end of the tube is covered by a thin wire-netting O‴, by which the air is finally relieved of the dust.

When the dust-laden air passes through the valve J and enters the chamber H, it is compelled to make a short turn under the member K′ of the inverted-**Y**-shaped deflector, then upwardly over a skimmer *h*, arranged between the members of the inverted-**Y**-shaped deflector, then downwardly and underneath the member *k* of the deflector K, and then upwardly and between another skimmer *h*. In making these short turns the dust is deposited under or against the skimmers and the purified or partially-purified air then goes upward and is finally screened and relieved of all its dust by the screen-slides M and M′ and the cap-screen O‴, the air then escaping into the room.

In operation, assuming that the pipe E is properly connected to a controlling-valve which is connected to a flexible hose which leads to a source of compressed-air supply, the device is placed in position on the carpet and the said valve opened, which causes a blast of air to enter the pipe E, which is ejected from the mouth *d* of nozzle D at an angle onto the carpet or down into and through the carpet, which air dislodges the dust and carries it upwardly through space I beyond the valve J and into the chamber H, where the air is relieved of its greatest portion of dust, after which the air is forced to travel the tortuous passage resulting from

the arrangement of the deflector-plate K and skimmers *h*. In passing through the cloth and wire screens in the slides M and M′ the air is relieved entirely of the dust and the purified air finally escapes through the screened orifice O‴ in the removable cap on top of the renovator.

In order to remove the collected dirt and dust in the chamber H, I cut in one end of the side wall A an opening which is covered by a door P, which is slidable in the slides Q′, as indicated in Fig. 5. To remove the dust, the door is slid out and the box turned on its end, which relieves the box of the collected dirt and dust.

In Fig. 5, G indicates a metallic cup which is screwed into the pipe E at an angle and sets vertically to the carpet. This cup is filled with formaldahyde or other disinfectant, and screw *g* is then adjusted, which regulates the flow of the disinfectant into the pipe E. The disinfectant is atomized by means of the blast of air passing from said pipe and is finally blown into the carpet, which thoroughly disinfects the same. This device is only to be used after the carpets are relieved of the dust. A pipe *g′*, leading from pipe E to the space above the liquid in receptacle G, may be employed for overcoming back pressure at the outlet-opening, and a valve *g″* is preferably introduced in pipe *g′* for well-known purposes.

The renovator in practice is moved back and forth over the carpet to be renovated in substantially the same manner as one would employ a carpet-sweeper.

While I have described my invention with relation to the renovation and fumigation of carpets, which can be accomplished easily without necessitating the removal of the carpets from their floors, still it is obvious that there are other articles that can be renovated and fumigated equally well, such as bedclothes, wearing-apparel, &c. The only feature to be observed in the renovation and fumigation of these other articles is the provision of suitable imperforate supports for the articles; otherwise the dust will be blown through and not collected in its proper receptacle.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my improved renovator may be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a renovator, the combination with a suitable casing open at its bottom, the walls of said casing extending down to engage the article to be cleaned or renovated, so that said article practically forms the bottom of the casing, of a nozzle carried by said casing and arranged to one side of said opening for discharging air under pressure at an angle and in a definite direction through the bottom of the casing, a passage for the dust-laden air leading up from the opening in the bottom of the casing from a point opposite the nozzle and tangentially into a chamber in said casing, a pressure-supply pipe connected to said nozzle, and skimmers arranged in said chamber, substantially as described.

2. In a renovator, the combination with a suitable casing, of a nozzle carried thereby and discharging air under pressure at an angle through the bottom of said casing, a supply-pipe connected to said nozzle, walls forming a space through which the dust-laden air is conducted to a chamber within said casing, a flap-valve acting as a deflector for the air as it enters the chamber, skimmers in said chamber, and deflectors in juxtaposition to some of said skimmers, forming a tortuous passage for the escape of the air from said chamber, substantially as described.

3. In a renovator, the combination with a casing and nozzle, of a passage for the dust-laden air arranged in said casing and leading into a chamber, skimmers arranged in said chamber, vertically-arranged deflector-plates arranged in advance of the outlet-opening from said chamber, and screens over said outlet-opening, substantially as described.

4. The combination with a casting formed with runners having rearward extensions *d′*, said casting being also shaped as to form one wall of a nozzle, of a sheet-metal casing arranged on said casting and having an inclined portion forming the other wall of said nozzle, said sheet-metal casing also forming a chamber for receiving the dust-laden air, and a supply-pipe connected to said nozzle; substantially as described.

5. The combination with a casing provided with a chamber for receiving the dust-laden air and a passage leading from the bottom of said casing into said chamber, of a nozzle arranged opposite said passage, and a plate forming one wall of the mouth of said nozzle, said plate being slotted transversely for the passage of screw-bolts, whereby said plate is capable of adjustment to enlarge or contract the mouth of the nozzle, substantially as described.

6. The combination with a casting formed with runners and bearing-surfaces, said casting, also, having a threaded opening affording a pipe connection, of a casing mounted on said casting and having one wall arranged to form a nozzle in conjunction with said casting, a passage for the dust-laden air leading from the mouth of said nozzle and into a chamber in the casing, and skimmers in said chamber, substantially as described.

7. The combination with a casing, of a nozzle, a passage for the dust-laden air leading from the mouth of said nozzle into a chamber in the casing, skimmers arranged transversely the walls of said chamber, and an inverted-Y-shaped deflector coöperating with some of

said skimmers to form a tortuous passage for the escape of air from said chamber, substantially as described.

8. The combination with a casing provided with a partition-wall dividing the same into two compartments, into the lower of which dust-laden air is tangentially admitted under pressure, of a communicating opening between said two compartments, skimmers arranged in the lower compartment for collecting the heavier particles of dust, and slidable screens arranged on each side of said communicating opening for collecting the lighter particles of dust, substantially as described.

9. The combination with a casing, of a nozzle, a passage for the dust-laden air leading from the mouth of said nozzle and discharging said dust-laden air tangentially into a chamber within the casing, skimmers in said chamber, and removable slide-screens M and M′ arranged above and below the outlet-opening from said chamber, substantially as described.

10. The combination with a casing having a partition-wall dividing the same into two compartments, of a nozzle arranged in the lower portion of the casing, a passage for the dust-laden air leading from the mouth of said nozzle and discharging the dust-laden air tangentially into a chamber formed by said lower compartment, screens arranged on each side of an opening which establishes communication between said two compartments, and an escape-opening leading from the upper compartment and covered by a screen, substantially as described.

11. In a renovator, the combination with a casing and nozzle, of a pipe for supplying compressed air to said nozzle, a passage for the dust-laden air arranged in said casing and leading into a chamber, skimmers arranged in said chamber for collecting the heavier particles of dust, screens over the outlet-opening from said chamber for collecting the lighter particles of dust, and a liquid-containing receptacle for admitting liquid into said supply-pipe to moisten or impregnate the air passing through the nozzle; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 13th day of December, 1899.

JOHN S. THURMAN.

Witnesses:
WM. H. SCOTT,
F. R. CORNWALL.