A. E. CHAPMAN.

PNEUMATIC SWEEPER AND RENOVATOR.

APPLICATION FILED OCT. 31, 1905.

1,183,952.

Patented May 23, 1916.

3 SHEETS—SHEET 1.

Fig. 1

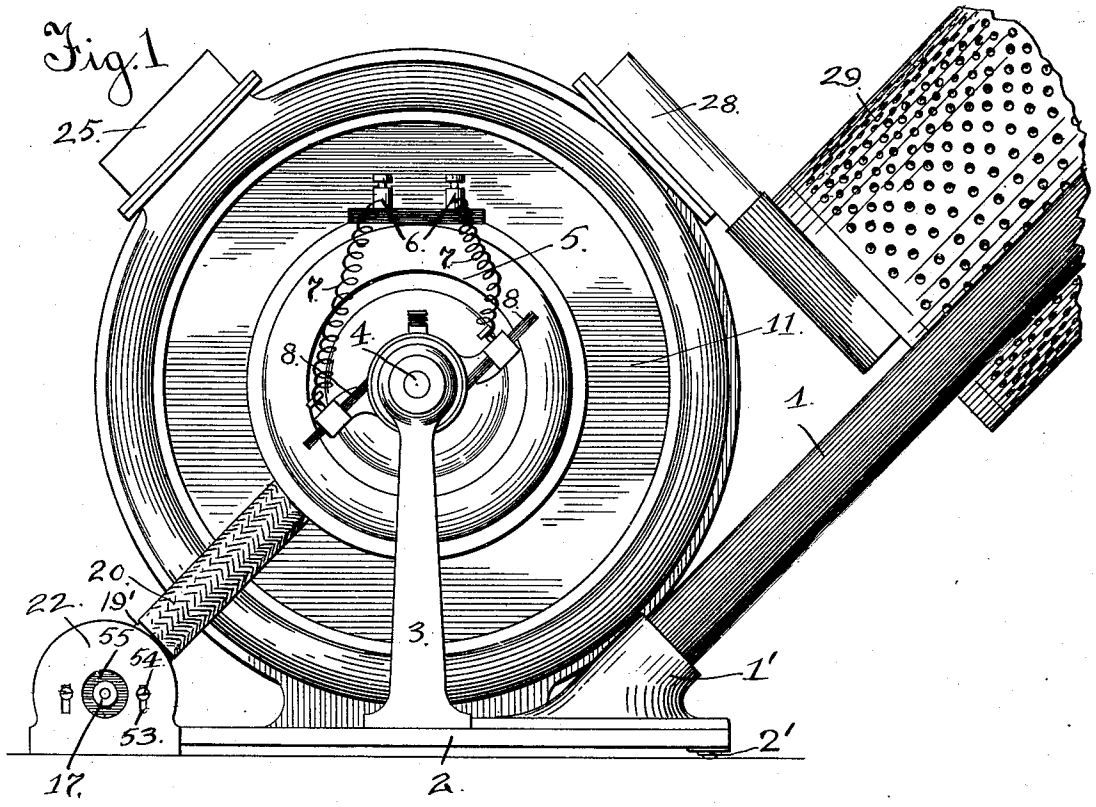


Fig. 2.

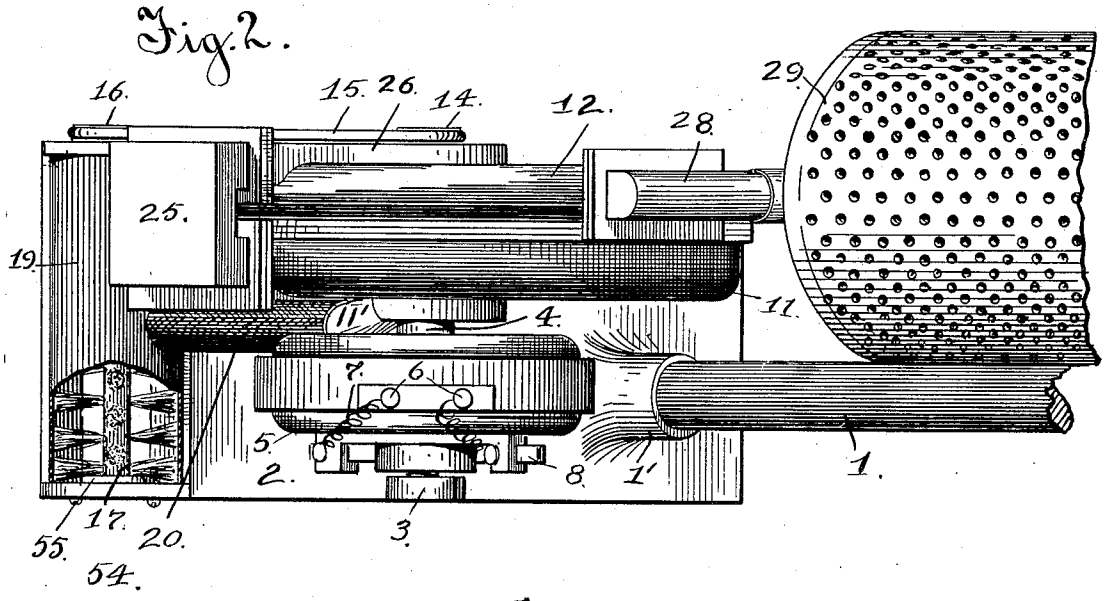
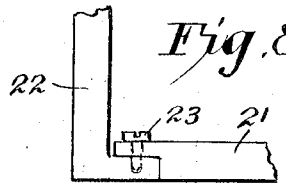


Fig. 8.



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3 SHEETS—SHEET 2.

Fig. 3.

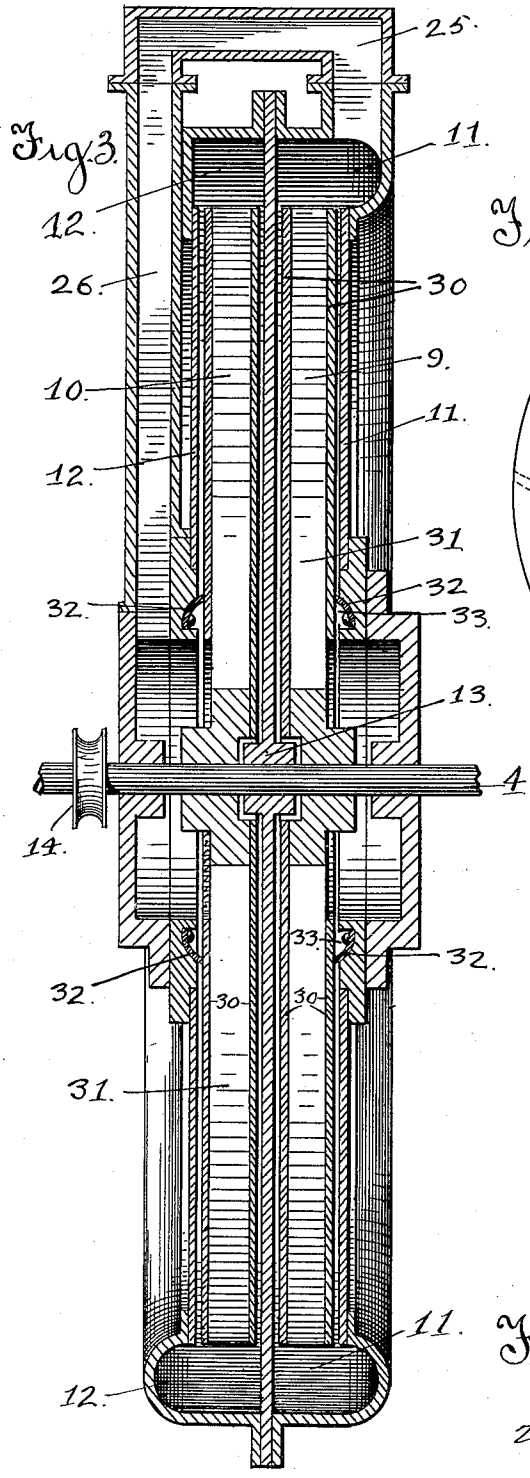


Fig. 4.

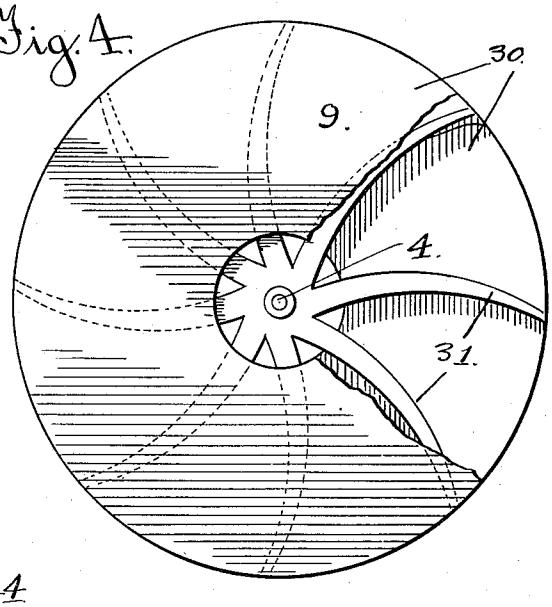


Fig. 5.

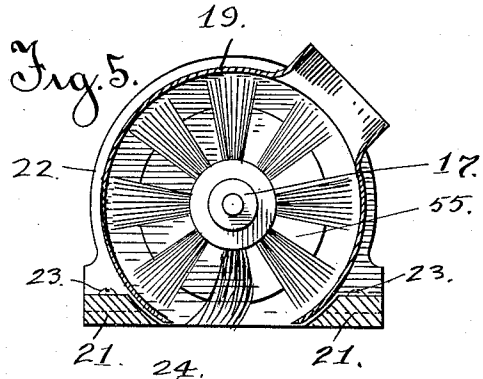
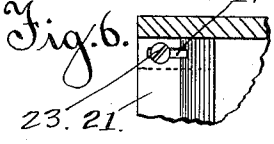


Fig. 6.



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3 SHEETS—SHEET 3.

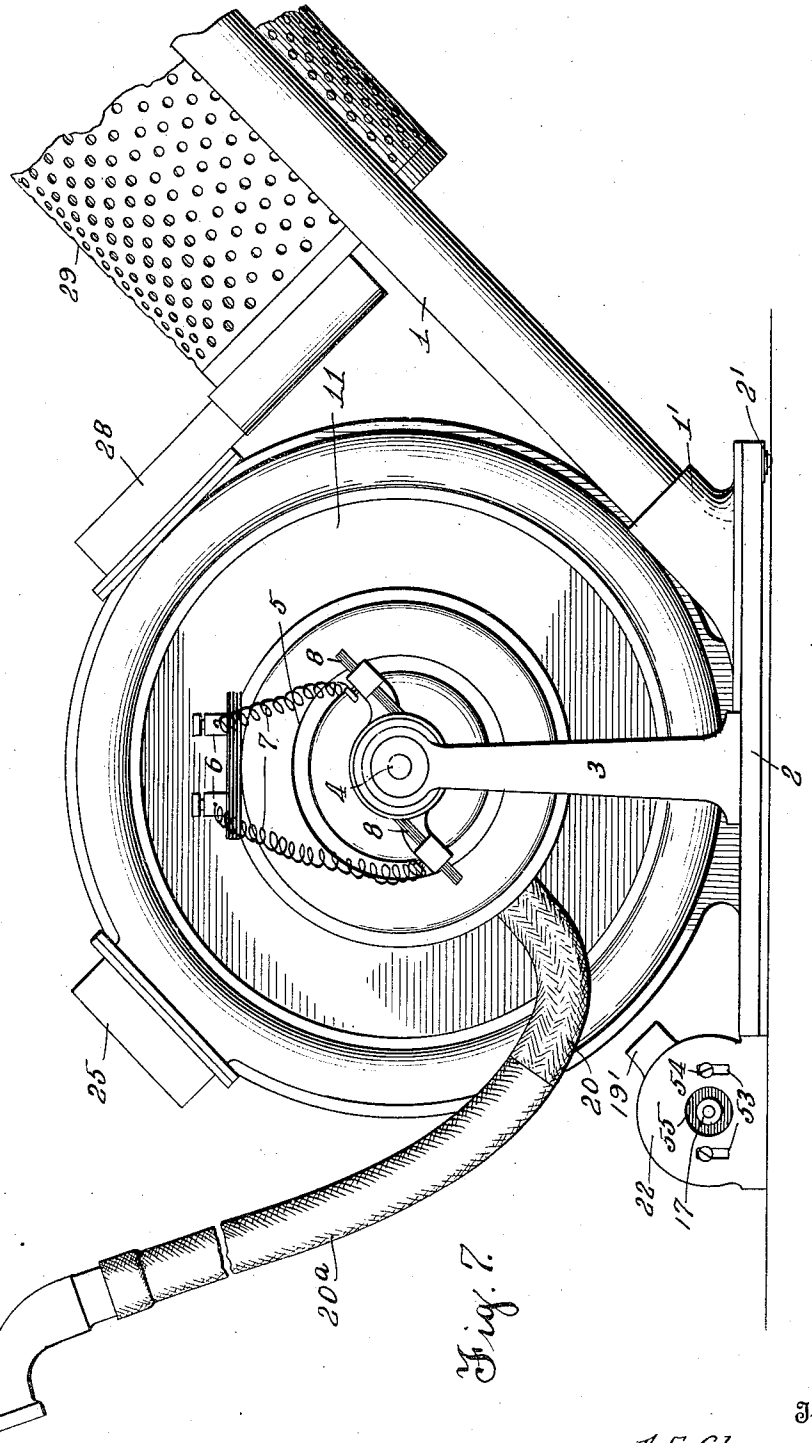


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

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PNEUMATIC SWEEPER AND RENOVATOR.

1,183,952. Specification of Letters Patent. Patented May 23, 1916.

Application filed October 31, 1905. Serial No. 285,239.

To all whom it may concern:

Be it known that I, ALONZO E. CHAPMAN, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Penumatic Sweepers and Renovators, of which the following is a specification.

This invention relates to improvements in pneumatic renovators, and more particularly to manually propelled devices of this character.

The primary object of the invention is to provide a self-contained machine of novel construction which will effectively remove dust from carpets, walls, and other surfaces by suction.

Further objects of the invention are to provide a device of this character which shall be compact and powerful in operation, and at the same time light in weight and easily movable from place to place and over the surface to be cleaned, thus rendering the machine readily adapted to domestic use.

With the above and other objects in view, the invention consists in the arrangement and construction of parts hereinafter described, and illustrated in the accompanying drawings, in which:—

Figure 1 is a broken side elevation of the apparatus. Fig. 2 is a broken plan view of the same. Fig. 3 is an enlarged cross section of the fans and the casings therefor. Fig. 4 is an elevation, of one of said fans, on a smaller scale than that of Fig. 3, parts being broken away. Fig. 5 is a sectional view of the brush and casing. Fig. 6 is a broken detail plan view showing the means of attachment of a shoe to the frame. Fig. 7 is a view similar to Fig. 1 illustrating the connection of attachment to facilitate removing dust from walls of a room, shelves of a closet, or the like. Fig. 8 is a detail view showing the connection between the shoe 21 and the end plates 22.

Referring to the drawings in detail, 1 represents the handle by which the carpet sweeper is moved about over the floor. It is attached at its lower end in a socket, 1′, secured to one end of a platform, 2, which has standards 3 to support the shaft 4 of the electro-motor 5 supplied with electricity from the binding posts 6, from which lead wires 7 to the brushes 8 of the motor. A flexible conductor (not shown) extends from said binding posts 6, to a lamp socket, or other suitable source of electricity.

It will be noted that the platform 2, is supported near the rear or handle end by means of casters or rollers 2′, while at its other or front end said platform carries a casing provided with a suction mouth designed to be moved over the surface to be cleaned, as the machine is trundled, thereover, the dust and dirt being drawn up through the suction mouth as will presently appear.

Upon the extended end of the motor shaft 4, are mounted a pair of fans 9, 10, which rotate in separate casings 11, 12, separated by a partition 13. On the extreme end of the shaft 4 is a pulley 14 around which travels a belt 15 passing also around a pulley 16 upon the shaft of a rotary brush 17, said brush revolving in a casing 19 secured to the platform 2 of the apparatus, at the front end thereof. This brush is not essential to the operation of the machine, and may be dispensed with if desired. The cleaning action of the apparatus is due, primarily to suction, and the brush, when employed, serves merely as a stirrer, to loosen up the nap of the carpet so the current of air may more readily remove the dust therefrom.

The casing 19 comprises a cylindrical body, and end plates 22. As clearly shown in Fig. 5, adjustable shoes, 21, extend between the end plates 22, on each side of the casing, and are secured to said plates by means of screws 23, passing through slots 24. The inner edges of these shoes are curved to conform to the curvature of the body of the casing, and it is obvious that by adjusting said shoes to or away from said casing, a crevice of greater or less width is formed between the shoes and body of the casing.

It will be noted, by reference to Fig. 1 that the lower edge of the casing 19 lies in a plane below the plane of the under surface of the platform 2. It will be further noted, by reference to Fig. 5 that the shoes 21 and end plates 22 constitute a relatively long and narrow suction mouth, the edges of which are adapted to make direct contact with the surface to be cleaned. This direct contact is a very vital factor in the efficiency

of the apparatus, and is made possible by the features of construction above described, namely, the suction mouth lying in a plane below the platform, and constituting the means for supporting the front end of the platform, while said platform is supported at its rear end solely by the rollers or casters. To a nipple 19′, formed on the casing 19, one end of a piece of tubing 20 is attached, and the other end is detachably secured to a nipple 11′, formed on the fan casing 11.

The air is drawn into the brush casing through the suction mouth, part being drawn through the carpet itself, and part through the crevices between the shoes 21 and the casing. This last portion enters the casing, and produces a sweeping action on that portion of the surface being cleaned that lies within the edges of the suction mouth. The dust laden air then passes from the casing 19, through the tube 20, to the fans, and is driven by centrifugal force to the periphery of the first casing 11, whence it passes by a conduit 25 to a pipe 26 on the outside of the casing for the fans and leading to the center of the casing 12 of the second fan 10. By means of this second fan it is discharged tangentially into a conduit 28 leading to a dust collector 29. These fans are of novel construction being formed of side plates 30 connected by curved vanes 31. In order to prevent air escaping along the sides of the fans between said side plates 30 and the sides of the casing therefor, there are provided cup-shaped annular washers 32 secured in recesses 33 in the sides of the casings.

The employment of a fan of the tandem, or multiple stage type I regard as an important feature of the present invention. Heretofore, so far as I am aware, no attempt has been made to combine a tandem fan with apparatus of this character. Prior cleaning devices of the portable type, have, without exception, employed single fans only, and these devices have, for the most part, been unsuccessful, for the reason that it is practically impossible to construct a single fan which shall be sufficiently powerful, and at the same time, compact enough for use in a manually propelled machine. By employing the tandem principle I am enabled to produce an exceedingly powerful fan within a comparatively small compass.

In order to enable the carpet sweeper to be used to the greatest advantage with carpets of various thickness and lengths of nap, the brush is made adjustable vertically by providing two slots 53 in which are adjusted clamping screws 54 attached to the bearing plates 55 of the brush shaft.

An important feature of this invention is that it can be utilized to great advantage as a renovator for removing dust from any desired surfaces, such as the walls of a room, shelves of a closet, or the like. To do this the tube 20 is removed from its connection with the brush casing and is attached to a hose 20^a provided at the free end with a suitable nozzle 20^b. The nozzle is then applied to the surface to be cleaned, and the motor started and dust will be drawn from said surface in the same manner as from the brush casing.

In the drawing and the foregoing description my invention has been illustrated in what I consider its best form of embodiment. The invention, however, is not limited to this particular form of embodiment.

What I claim is:—

1. In a sweeper, the combination with a movable platform, of a motor mounted on said platform and having a shaft, a fan secured on said shaft, a fan casing around said shaft, a brush, an operative connection between said brush and motor, and a casing for said brush, a dust collector also carried by said platform, a conduit between said brush casing and fan, a conduit leading from said fan to said dust collector, and adjustable means for directing air to the working point of said brush, substantially as specified.

2. In a carpet sweeper, the combination with a platform mounted on rollers, a motor supported at one side of the platform, the shaft of the motor extending across the same, a fan secured upon the shaft at the other side of the platform, a casing therefor, a brush, an operative connection between said brush and motor, a casing for the brush, means for varying the amount of air admitted to the brush casing, a conduit leading from said brush casing to said fan casing, a dust collector also carried by the platform, and a conduit leading from said fan casing to said collector, substantially as described.

3. In a carpet sweeper, the combination of a platform, a handle secured to said platform for propelling the same, a motor supported on said platform, a fan secured upon the shaft of the motor, a casing mounted on said platform, an adjustable shoe for varying the amount of air admitted to said casing, a conduit leading from said casing to said fan, a dust collector carried upon the platform, and a conduit leading from said fan to said collector, substantially as described.

4. In combination with a movable platform, a fan and motor mounted thereon, a casing carried by said platform and provided at its bottom with a suction-mouth adapted to make direct contact with the surface on which the platform is supported, a conduit leading from said casing to said fan, and means for directing air downwardly along the edges of said suction-mouth and

thence upwardly into the same, whereby said air is caused to impinge against the surface being cleaned with a sweeping action.

5. In a sweeper, a movable platform, a motor mounted thereon, a brush and fan also on said platform operatively connected to said motor, separate casings containing said brush and fan and connected together by a conduit which forms the outlet from said brush casing and the inlet to said fan casing, and adjustable means for admitting the air to the brush casing adjacent the bottom thereof, substantially as and for the purpose set forth.

6. In a pneumatic sweeper, a casing provided with a suction mouth having fixed edges adapted to make contact with the surface being cleaned, means for creating an air-suction through said mouth, and a shoe adjustable toward and away from one of said fixed edges whereby a current of air is directed downwardly through the space between said edge and shoe and then upwardly into said suction mouth.

7. In a pneumatic sweeper, a supporting platform, a casing carried thereby and provided with a suction mouth, having fixed edges, means for creating an air-suction therethrough, the ends of said casing being extended so as to rest on the surface being cleaned, and a pair of shoes supported between said extended ends and adjustable toward and from said fixed edges, one of said shoes being arranged along each edge of said suction mouth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALONZO E. CHAPMAN.

Witnesses:
E. WOODWARD,
BESSIE GORFINKEL.