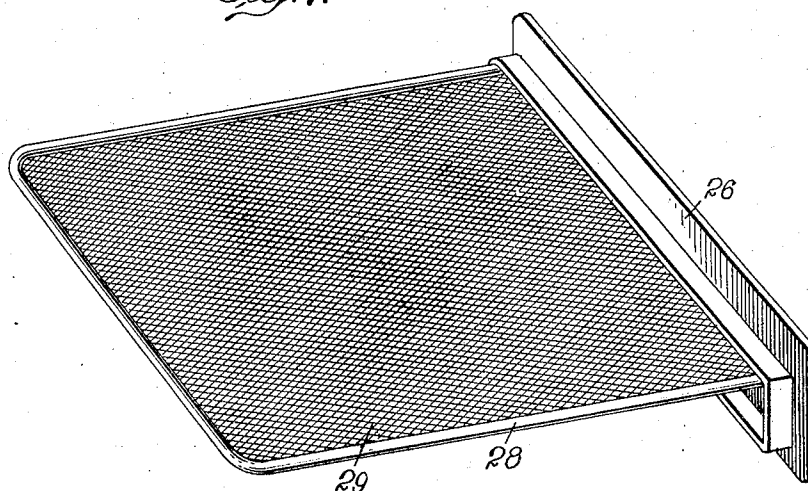
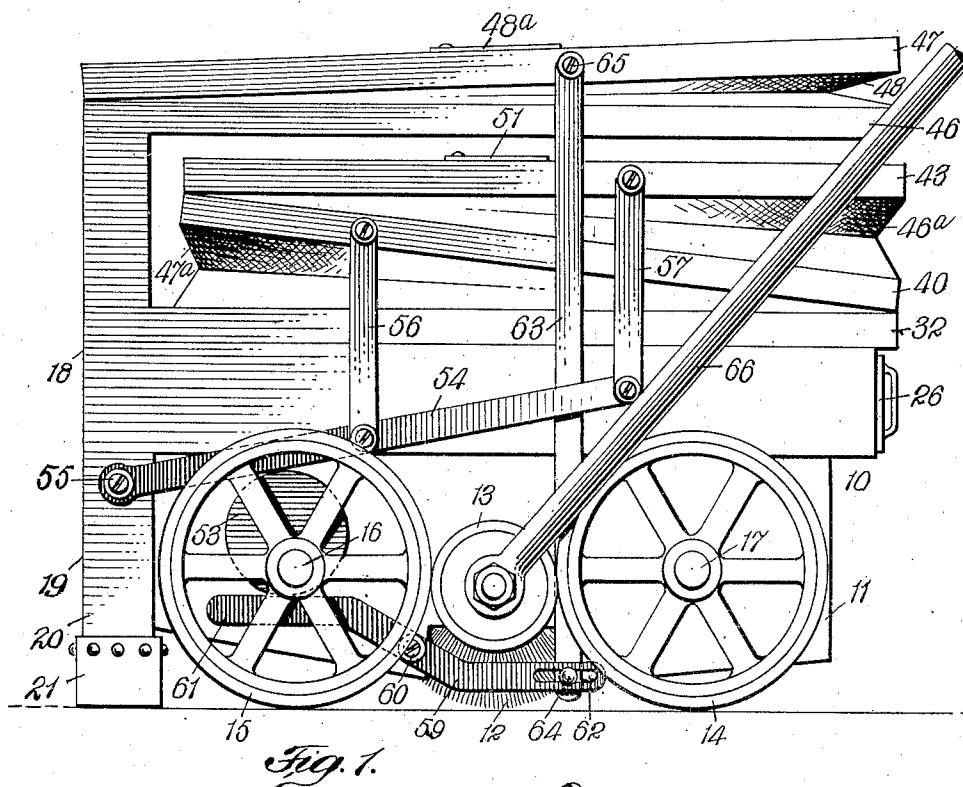




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VACUUM CLEANER.

APPLICATION FILED JULY 10, 1909.

1,016,600.

Patented Feb. 6, 1912.

2 SHEETS—SHEET 2.

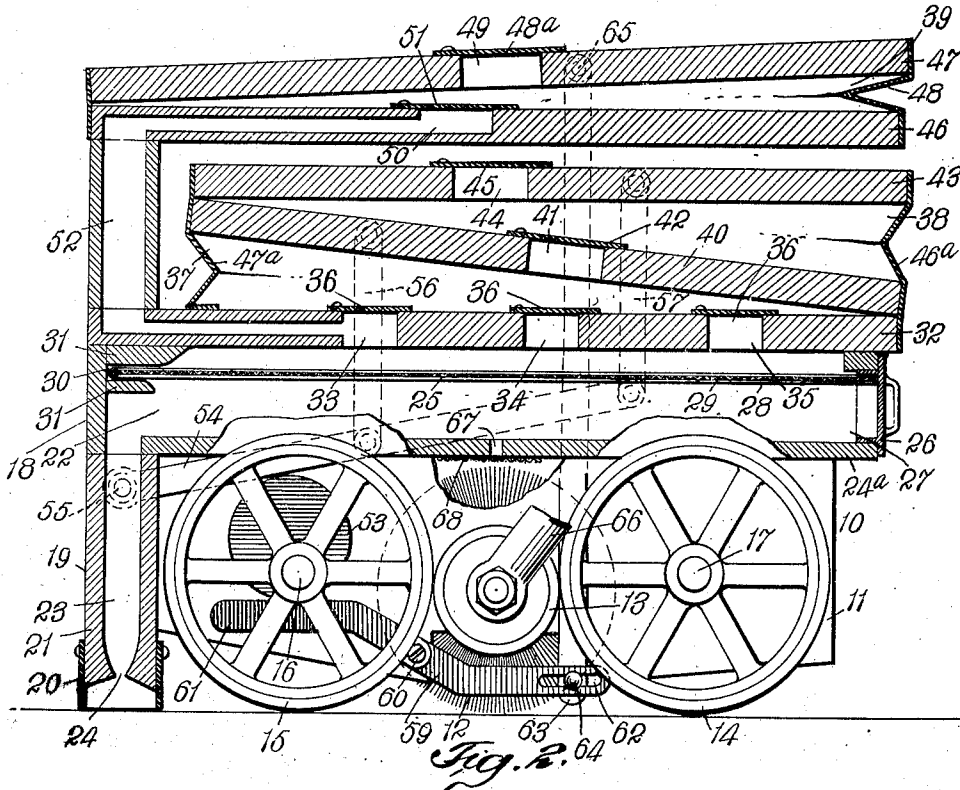


Fig. 2.

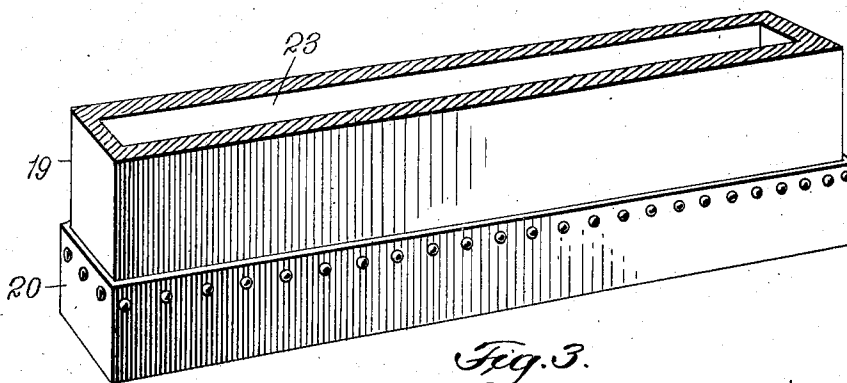


Fig. 3.

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VACUUM-CLEANER.

1,016,600.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed July 10, 1909. Serial No. 506,873.

To all whom it may concern:

Be it known that I, EUGENE W. APPLGATE, a citizen of the United States, and a resident of Hoboken, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Vacuum-Cleaners, of which the following is a full, clear, and exact description.

This invention relates more particularly to a manually operated vacuum cleaner having a brush element cooperating therewith for the proper cleaning of carpets and for other purposes.

The primary object of the invention is to combine in a single device simple and improved means whereby a vacuum may be created so as to draw the dust from within the body of the carpet or nap as well as the particles capable of being drawn within a device by such means, and to combine with the pneumatic features a suitable sweeping element, as a rotary brush, which tends to agitate and stir the dust and place the nap of the carpet or the like in condition to have the dust removed by the vacuum producing means, so that by a cooperation of the features of said device, the carpet, rug, etc., will be effectually cleaned.

Other objects of the invention are to provide a simple and efficient device in which the dust may be drawn from the carpet, rug or other article within a chamber in such a way that the surrounding air will not be drawn within said chamber except through the nap or body of the carpet or article being cleaned; to provide simple means whereby a positive and substantially continuous suction action will be created; to provide simple means whereby the device may be readily cleaned of the dust and the like, and to provide simple means whereby the dust agitated or caused to fly in the air about the brush may be drawn within a chamber and the brush made to serve to clean the entrance or inlet to the chamber of nap or particles that might tend to cling to and clog the same.

Another object of the invention is to provide a vacuum device which may be attached to the usual form of sweeper, and which will occupy comparatively little more space, except possibly as to height, than the ordinary sweeper.

A further object of the invention is to provide a simple and efficient device in

which the means for rotating the brush element may be also made to operate one or more pumping elements to create sufficient suction to draw the dust and particles within the device.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a side elevation of one form of device embodying my invention, the operating handle being partly broken away. Fig. 2 is a longitudinal section, partly broken away and partly in elevation, of the device. Fig. 3 is a fragmentary perspective view of a part of the suction device; and Fig. 4 is a detail perspective view of the device for catching the dust and particles within the vacuum chamber.

The device 10 may have the usual or any preferred form of sweeper such as usually employed for sweeping carpets and in which is arranged means, as pans, for receiving the litter and particles, and adapted to force the dirt, etc., into the pans 11 is a rotary brush 12. This brush is provided with a roll or friction disk 13 which is adapted to be engaged by the wheels 14 and 15 located at the front and rear of the device, so that as the device is moved along the carpet or other article, the brush will be positively driven to force the particles within the pans 11 as is usual in the ordinary form of sweeper, the said wheels 15 at the forward part being supported on the axles 16 and the wheels 14 on the axle 17 in the usual manner.

The frame or casing 18 is arranged over the pans 11 and may form a part thereof, and at the forward part of the casing or frame 18 is a downwardly-projecting tubular suction conduit 19, on the lower part of which is held a flexible shoe, as 20, of rubber or other material which may be secured to the lower end 21 of the suction conduit. This element 20 is held to the tube 19 in any desired way and is substantially rectangular in form and has its lower edge adapted to come in contact and to form a proper yielding bearing surface against the carpet or other article in such a way as to cause the

air when suction is created within the part 20, as will be hereinafter described, to pass through the nap or body of the carpet. The dust and particles will pass through the shoe 20, and the downwardly-projecting conduit 19, into a vacuum chamber 22 located above the brush 12. The suction conduit 19 has an opening 23 therethrough which converges so as to provide a contracted opening, as 24, above the lower edge of the shoe 20, and said vacuum chamber has a base or member 24^a above which is a screen or dust-collecting device 25. The device 25 has a cover or cap 26 adapted to close the opening 27 at the rear of the chamber for the removal of the dust and particles, and projecting from the cap 26 is a frame 28 which is substantially rectangular in form and is covered with an open mesh material 29, as cheese cloth, which serves to prevent the dust from passing by the same and which collects the dust and particles thereon so that when the device is removed the lighter particles may be removed therewith, while the heavier particles may be removed from the chamber through the open end 27 by tilting the device or in any other preferred way. The device 25 has its frame 28 guided at its forward edge in a groove 30 between the bars 31 so as to properly support the same in such a way that the said device may be readily removed.

To create suction within the vacuum chamber 22 various means may be employed. As shown, the vacuum chamber is provided with a fixed plate 32 in which are arranged a plurality of openings 33, 34, and 35 each of which is provided with a valve 36 of the usual flexible kind, and these openings are in communication with the pumping elements 37, 38 and 39. As shown, the pumping elements are in the form of bellows and the bellows 37 and 38 are connected together to work in unison. The valves 36 open into the bellows 37 and said bellows is provided with a movable board 40 having an opening 41 over which is a valve 42, the said valve opening into the bellows 38. The bellows 38 is provided with a movable board 43 in which is an opening 44 controlled by an outwardly opening valve 45 of the usual flexible kind which is adapted to communicate with the atmosphere outside of the device. The boards 40 and 43 are connected together by a bellows-like flexible connection, as 46^a, and the boards 40 and 32 are connected by a bellows-like flexible connection 47^a so that said boards 40 and 43 may be moved toward or from the fixed plate 32 and thereby create suction within the vacuum chamber 22. The upward movement of the board 43 closes the valve 45 and opens the valve 42, and the upward movement of the board 40 opens the valves 36 covering the openings 33, 34

and 35 and draws air from the chamber 22 into bellows 37, and on movement of the boards 40 and 43 of the bellows in the opposite direction the valves 45 will open and the valves 36 will close. By this means a positive suction will be created within the vacuum chamber 22 so as to draw the dust and particles within said chamber through the body and nap of the carpet or other article.

The bellows 39 acts in a direction opposite to the bellows 37 and 38. The bellows 39 has a normally fixed board 46 and a movable member 47 connected together by bellows-like flexible means, as 48, in the usual way, and the board 47 is provided with a valve 48^a opening outwardly and which is adapted to close the opening 49 in said board. An opening 50 communicates with the bellows 39, and this opening is controlled by a valve 51, the opening 50 being in communication with the opening 33 through a channel 52. The bellows 39 when operated to move the board 47 away from the board 46 will close the valve 48^a and open the valve 41 and as the valves 36 of the fixed plate 32 are closed, suction will be created within the chamber 22 to cause the dust and particles to enter therein, and as this action of the board 47 is opposite to the action of the bellows 37 and 38, the suction action will be substantially continuous.

To positively operate the pumping elements by the same means which operate the brush 13 any suitable mechanism may be used. As shown, the bellows 37, 38 and 39 move in one direction by gravity and are positively forced in the opposite direction, though, if desired, they may be positively moved in both directions. An eccentric 53 is secured at or near each end of the axle 16 adjacent to the wheels 15 and adapted to be engaged by said eccentrics are the arms or levers 54. These levers are pivoted at 55 to the side of the tube 19 and are connected by links 56 to the board 40 of the bellows 37 and by the links 57 to the board 43 of the bellows 38. A lever 59 is pivoted at 60 on each side of the body 11 and one end of each lever, as 61, is adapted to be engaged by one of the eccentrics 53 and the other end of said lever is slotted, as at 62, and is connected by a link 63, to the board 47 of the bellows 39, the said link being pivoted with a bolt or pin 64 at one end entering the slot 62 and is pivoted at 65 at its other end to the board 47. When the device is moved along the carpet or other article to be cleaned, the wheels 14 and 15 will be rotated and this will impart movement to the eccentrics 53 and as the said eccentrics 53 are rotated they will move the set of levers 54 in one direction and the set of levers 59 in the opposite direction. This movement through the links 56 and 57 and the links 64, will

operate the bellows 37 and 38 in unison, while the bellows 39 will be independently operated in the opposite direction and said bellows alternate in their movement with relation to each other to create proper suction within the vacuum chamber 22.

The device may be provided with a suitable handle 66 of any desired form, so that the device may be manually moved the same as the ordinary carpet sweeper, and adjacent to the rotary element or brush 12 is an opening 67 over which is arranged a screen or device 68 to prevent heavy particles from passing within the same and of such a mesh that the dust created by the action of the brush may be withdrawn within the vacuum chamber 22. The action of the suction on the brush tends to remove the dust therefrom, and the brush in its rotation will keep the screen or device 68 clean of nap or other particles which might tend to clog the same and prevent the dust from passing into the vacuum chamber.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A device of the character described, including a vacuum chamber, means for carrying said device, a suction conduit at one end of said vacuum chamber, a plurality of bellows, the movable member of one of said bellows being connected at one end to the fixed top member of said vacuum chamber, the movable member of a second bellows being connected at its opposite end to the movable member of the last referred to bellows, and means for actuating said bellows comprising a plurality of links connected to said bellows respectively, a lever pivotally connected to said links and the frame of the device and receiving movement from said carrying means.

2. A device of the character described, including a vacuum chamber, a suction conduit fixed to one end of said vacuum chamber, carrying means for the device, a plurality of bellows, the movable member of one of said bellows being connected at one end to the fixed or top member of said vacuum chamber, the movable member of the second bellows having its opposite end connected to one end of the movable member of the last referred to bellows, an additional fixed member, the movable member of the third bellows having one end connected

to said additional fixed member, said vacuum chamber having a plurality of valved openings communicating with said bellows, and actuating means for said bellows comprising a plurality of links connected to said bellows respectively, a lever pivotally connected to said links and the frame of the device and receiving movement from said carrying means.

3. A device of the character described, including a vacuum chamber, having a suction conduit at one end thereof, means for carrying said device, a plurality of bellows, the movable member of one of said bellows being connected at one end to the fixed top member of said vacuum chamber, the movable member of the second bellows having its opposite end connected to the movable member of the last referred to bellows, an additional fixed member, and the third bellows having its movable member connected to said additional fixed member, said vacuum chamber having a plurality of valved openings communicating with said bellows, a plurality of links connected to said bellows respectively, a lever connected to two of said links, a lever for actuating said third link, said levers receiving their movement from said carrying means.

4. A device of the character described, including a vacuum chamber, having a suction conduit at one end, carrying means for said device, a plurality of bellows, the movable member of one of said bellows having one end connected to the fixed top member of said vacuum chamber, the movable member of the second bellows having its opposite end connected to the movable member of the last referred to bellows, an additional fixed member, the movable member of the third bellows being connected at one end to said additional fixed member, said vacuum chamber having a plurality of valved openings, a series of links connected to said bellows, a lever connected to two of said links, a lever connected to the third link, and a cam actuated from said carrying means, said cam engaging said levers.

This specification signed and witnessed this 9th day of July A. D. 1909.

EUGENE W. APPLGATE.

Witnesses:

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M. DINNHAUPT.