

July 31, 1923.

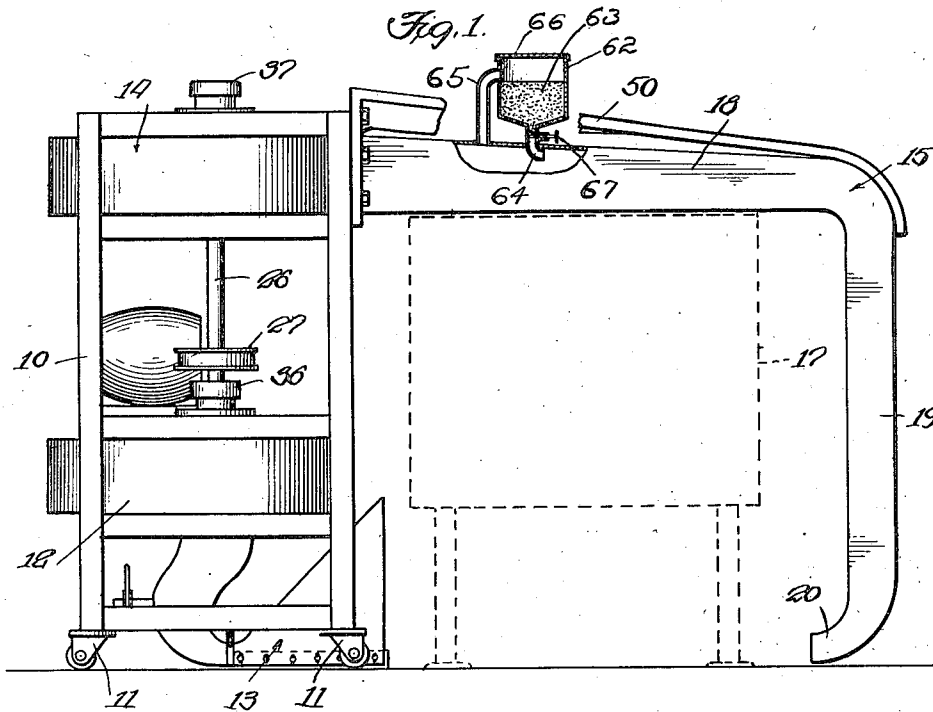
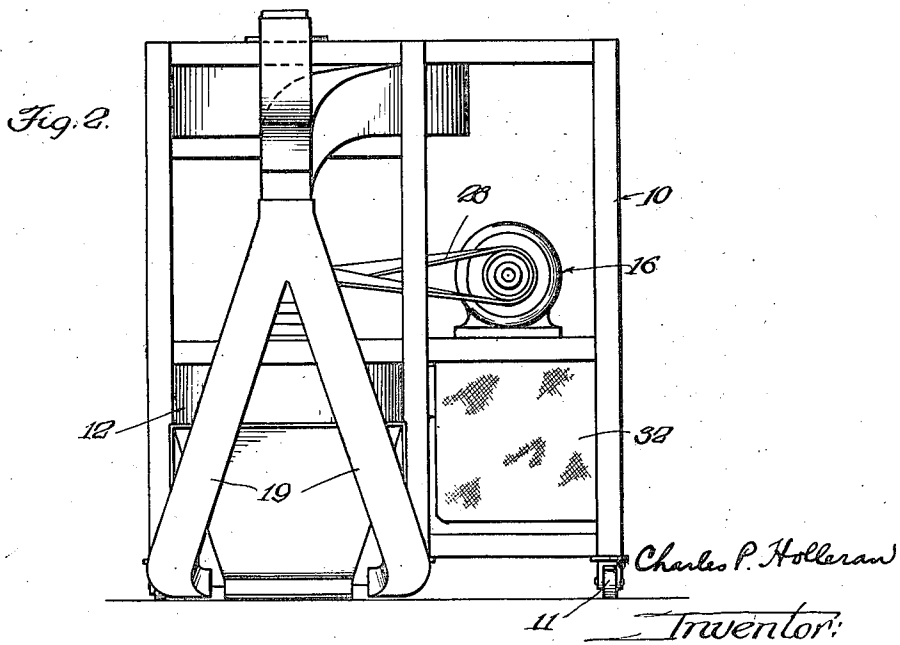
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C. P. HOLLERAN

COMBINED BLAST AND SUCTION SWEEPER

Filed July 26, 1920

3 Sheets-Sheet 1



Charles P. Holleran

Inventor:

By Jones, Addington, Ames & Seibold Attys.

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3 Sheets-Sheet 2

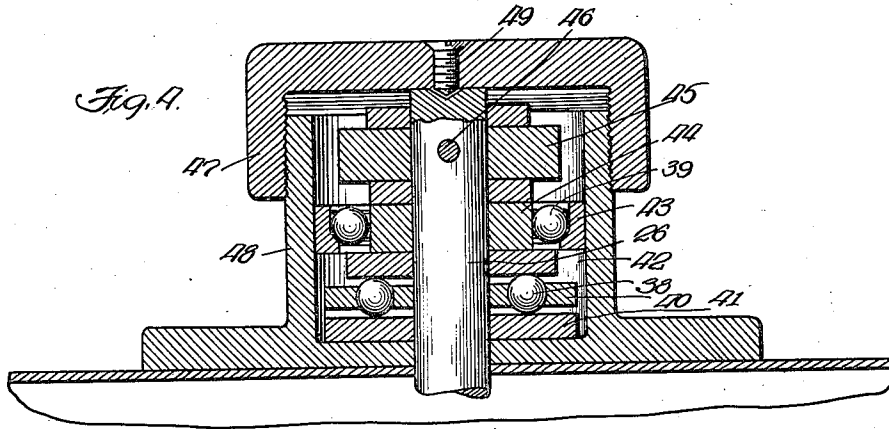
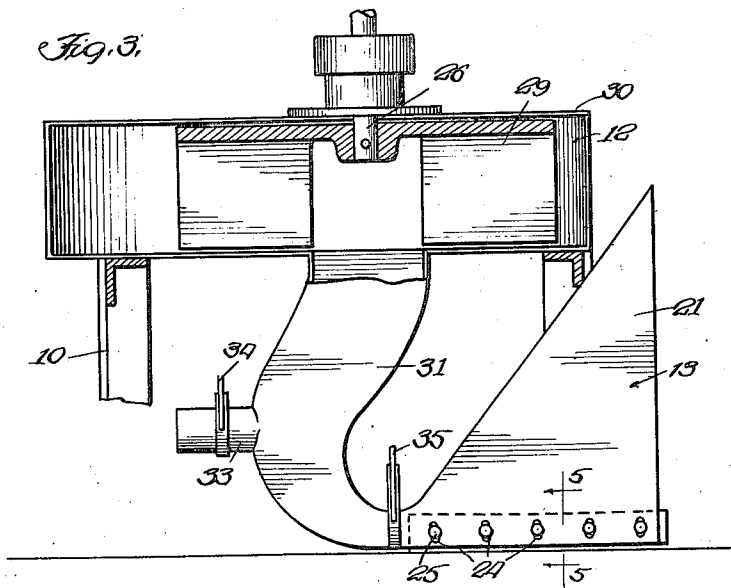
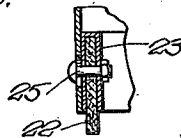


Fig. 5.



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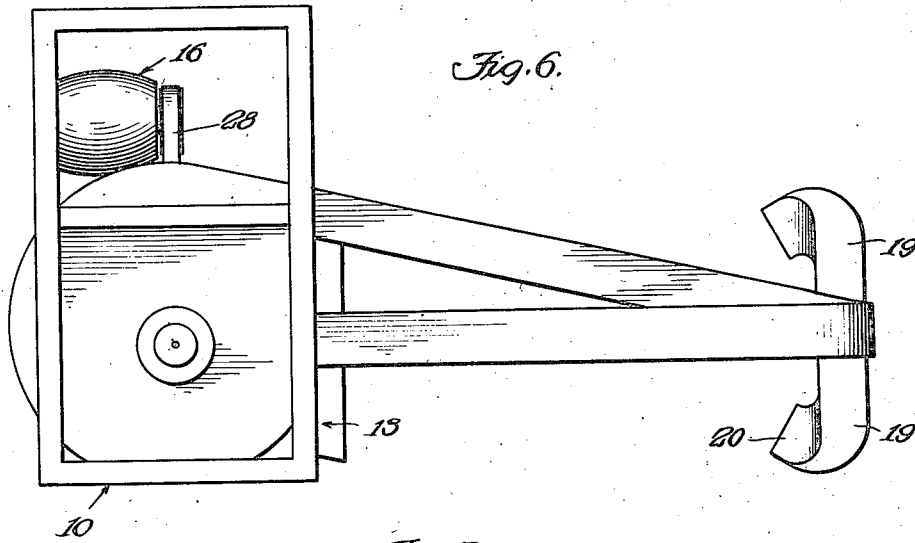
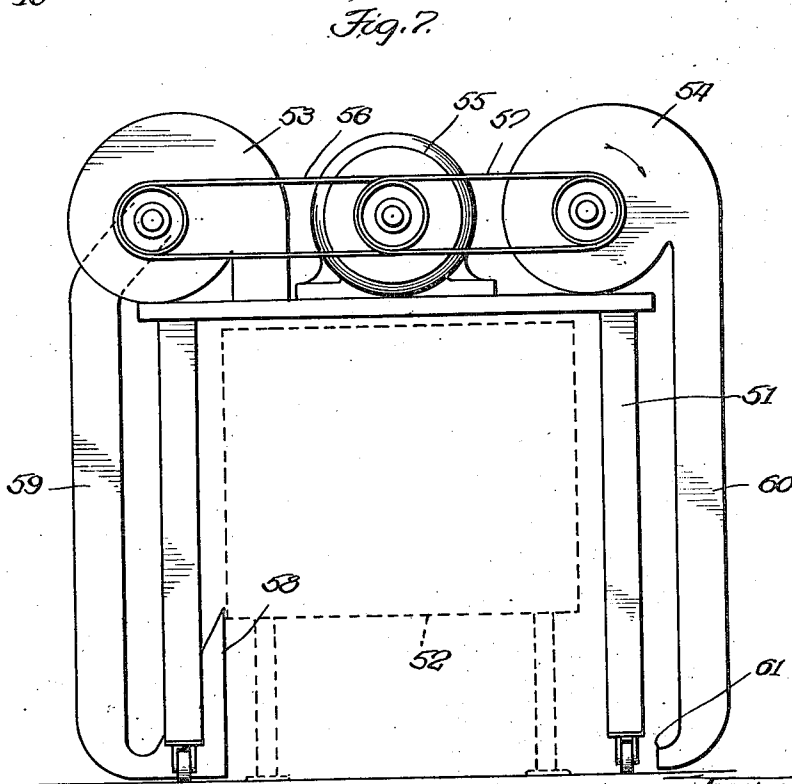
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COMBINED BLAST AND SUCTION SWEEPER

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3 Sheets-Sheet 3



Inventor:
Charles P. Holleran

By Jones, Addington, Ames & Seibold Attys

UNITED STATES PATENT OFFICE.

CHARLES P. HOLLERAN, OF CHICAGO, ILLINOIS.

COMBINED BLAST AND SUCTION SWEEPER.

Application filed July 26, 1920. Serial No. 399,071.

To all whom it may concern:

Be it known that I, CHARLES P. HOLLERAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Combined Blast and Suction Sweepers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to a combined blast and suction sweeper, and more specifically to a combined blast and suction sweeper for use in sweeping out underneath a row of desks such as are found in school rooms and the like.

One of the objects of my invention is to provide an improved combined blast and suction sweeper device, which can be moved along a row of desks and which will blow the dust out from under the row of desks and will suck it up on the other side.

A further object of my invention is to provide such a device which will be efficient in operation, and durable and simple in construction.

Further objects will appear from the detailed description to follow and from the appended claims.

In the drawings in which two embodiments of my invention are shown:

Fig. 1 is a side elevation of a combined blast and suction sweeper showing in dotted line the outline of a desk, and showing the device in position with respect to the desk;

Fig. 2 is an elevational view from the right of Fig. 1;

Fig. 3 is a detail view showing the construction of the suction head and blower;

Fig. 4 is an axial sectional view of a bearing used in connection with the blowers;

Fig. 5 is a detail view showing the sealing pad between the suction head and the floor;

Fig. 6 is a plan view of the sweeper; and

Fig. 7 is a side elevation of another form of sweeper embodying my invention.

The construction shown in Figs. 1 to 6 of the drawings comprises in a general way a movable carriage 10, mounted on casters 11, a suction blower 12 and a suction head 13 mounted on the carriage 10, and a blast blower 14 and blast head or pipe 15 also mounted on the carriage 10, both of the blowers 12 and 14 being driven from a suitable electric motor 16.

The blast head or pipe 15 leads from the

blower 14 over the top of the desk 17, as indicated at 18, to a pair of downwardly-extending branch pipes 19, terminating in curved inwardly-extending nozzles 20, which deliver converging blasts underneath the desks 17 to blow the dust and rubbish underneath the desks over into the suction head 13, which sucks in this dirt and rubbish and delivers it to a suitable dust receptacle.

The suction head 13 comprises a flaring hood or suction nozzle 21, open on the under side, and having considerable lateral and vertical extent, so that it will extend up high enough to catch and receive all of the dust and rubbish blown over toward it from the blast nozzles 20. A sealing strip 22 is provided at the lower edge of the hood 21 to provide a sealing engagement between the suction head and the floor, a section of this sealing strip being shown in Fig. 5. As shown in Fig. 5, this sealing strip may comprise a strip of felt or cloth seated in a sheet metal channel member 23, the channel member being adjustably secured in vertical slots 24 of the suction head by means of small bolts 25.

The blowers 12 and 14 may be of any suitable type, and as shown are both mounted to be driven from the vertical shaft 26, to which is secured a belt pulley 27, which is driven from the motor 16 by means of the belt 28. The fan blades 29 of the blower 12 are secured to this shaft 26 and rotate in the blower casing 30 as shown in Figure 3. The suction head 13 is in communication with the interior of the blower casing 30 by means of a curved suction tube 31. The dust and rubbish is sucked into the blower casing 30 through the suction head 13 and conduit 31, and is delivered into a suitable dust receptacle 32 located underneath the motor 16.

If desired, the suction conduit 31 may be provided with a branch suction pipe 33, which provides a connection for any suitable vacuum cleaner, valves 34 and 35 being provided so that the suction head 13 may be cut off and the entire exhaust effect brought to bear upon the vacuum cleaner connected with the branch conduit 33, or so that the conduit 33 may be closed off and the entire suction brought to bear upon the suction head 13.

Suitable anti-friction bearings may be provided at 36 and 37 for the shaft 26, the bearing 37 being shown in detail in Fig. 4,

and comprising a set of ball bearings 38 to take care of the downward thrust, and a second set of ball bearings 39 to take care of the lateral thrust. The set of ball bearings 38 are suitably mounted in a ball cage 40 and operate between a fixed bearing plate 41 and a rotatable bearing plate 42. A set of ball bearings 39 are mounted between a suitable stationary bearing ring 43 and a rotatable bearing ring 44 secured to the shaft 26. In order to support the shaft in position with respect to the bearing ring 42, it is provided with a bearing collar 45 which is secured to the shaft by means of a transversely-extending pin 46.

A suitable cap 47 is screwed onto the casing 48 in which the bearing is enclosed, in order to keep dirt, etc., out of the bearing. A hold-down screw 49 is provided to position the shaft 26 and prevent it from rising, the lower end of this screw 49 extending into a depression in the upper end of the shaft. A similar bearing is provided at 36 for the lower end of the shaft.

A suitable brace or tension member 50 may be provided for supporting the blast pipe 15.

In operation, the sweeper is moved into position to "straddle" the row of desks, that is, with the carriage 10 on one side and the blast pipe 15 extending over across the row of desks and down on the other side. The motor 16 is then put into operation to cause the blowers 12 and 14 to operate to deliver a blast of air through the nozzles 20, and to suck in the dirt and rubbish which is driven out from under the row of desks through the suction head 13 and to cause the dirt and rubbish thus sucked in to be delivered into the dust receptacle 32. As the blowers are operated, the carriage 10 is propelled along the row of desks, so that the entire space underneath the row of desks is quickly and thoroughly swept or cleaned.

It is obvious that this device is adapted for cleaning an open space, that is, a space which is not obstructed by a row of desks, as well as for cleaning an obstructed space.

The construction shown in Fig. 7 operates in a similar manner, but in this construction the carriage 51 straddles the row of desks 52, and the blowers 53 and 54 are mounted on opposite sides of this carriage and driven from a centrally located motor 55 by means of a pair of belts 56 and 57. The blower 53 is connected with the suction head 58 by means of a downwardly-extending suction tube 59, and the blower 54 may be provided with one or more downwardly-extending blast pipes 60 leading to blast nozzles 61 which deliver blasts of air underneath the row of desks, and drive the dust, dirt, etc. over toward the suction head 58. The operation, as stated above, is substantially the same as the operation of the form previously described.

If desired, means may be provided for supplying saw-dust or an equivalent sweeping compound to the blast nozzle to assist in sweeping up underneath the row of desks. These means, as indicated in Fig. 1 may comprise a receptacle fixture 62 in which the sweeping compound fixture 63 is placed, a discharge conduit 64 leading from the receptacle fixture 62 into the blast pipe 15, and a pressure equalizing conduit 65 communicating with the blast pipe 15 and with the receptacle 62 above the upper surface of the sweeping compound in the receptacle. A suitable cover 66 may be provided for the receptacle 62 and a suitable controlling valve 67 may be provided for controlling the discharge of the sweeping compound through the discharge nozzle 64.

The operation of the means for supplying the sweeping compound is as follows: The sweeping compound is placed in an air-tight receptacle 62, falls down by gravity into the discharge conduit 64, the injector action of the blast pipe 15 also aiding in causing the discharge of the sweeping compound, and the pressure equalizing conduit 65 equalizing the pressure above and below the sweeping compound. The sweeping compound is delivered from the blast nozzle 20 and strikes the floor underneath the desks and is swept across the floor, assisting in cleaning up the space underneath.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A pneumatic sweeper for sweeping the space underneath an article of furniture, comprising a suction head, a blast nozzle spaced a substantial distance from said suction head, sufficient to receive the article of furniture between them, said blast nozzle being directed toward said suction head, whereby the dirt underneath said article of furniture may be blown toward said suction head by said blast nozzle and sucked up by said suction head.

2. A pneumatic sweeper for cleaning underneath a row of furniture, comprising a carriage, a suction head, and a blast nozzle, said suction head and blast nozzle being supported by said carriage and mounted so that they will be on opposite sides of the row of furniture, said blast nozzle being directed toward said suction head, the direction of said blast being substantially transverse to the line of travel of said carriage, whereby as said carriage is moved along said row of furniture, the dirt underneath said row will be blown by said blast nozzle over into said suction head, and sucked up by said suction head.

3. A pneumatic sweeper for sweeping underneath a row of furniture, comprising a carriage, a suction head, a blast nozzle, a suction blower, a blast blower, and a vertical shaft for driving both of said blowers, said

- suction head and blast nozzle being spaced so that one can be on one side of a row of furniture, and the other on the other side of the row of furniture, said blast nozzle being directed toward said suction head, whereby as said carriage is moved along said row of desks said blast nozzle may blow the dust underneath said row of furniture over toward said suction head.
- 10 4. A pneumatic sweeper for sweeping underneath an article of furniture, comprising a suction head and a blast nozzle spaced a substantial distance from said suction head, whereby said blast nozzle and suction head may be located on opposite sides of the article of furniture, said suction head having a branch connection and valves controlling the main suction head and the branch connection, whereby a vacuum cleaner can be secured to said branch connection and the valves operated so as to use the vacuum cleaner if desired or the suction head if desired, or both vacuum cleaner and suction head at the same time.
- 25 5. A pneumatic sweeper comprising a suction head, a blast nozzle spaced a substantial distance from said suction head directed so as to deliver the blast toward said suction head, means for forcing air through said blast nozzle, and means for supplying a granular sweeping material to the space between said blast nozzle and suction head, whereby the dirt and rubbish between the blast nozzle and the suction head as well as the granular sweeping material will be blown toward said suction head and sucked up by said suction head.
6. A sweeping device comprising a suction head, a blast nozzle and means for supplying a sweeping compound to the blast nozzle, said means comprising a receptacle for the sweeping compound, having a conduit in communication with the blast nozzle, and an equalizing conduit in communication with the blast nozzle leading to the receptacle above the surface of the sweeping compound.
- In witness whereof, I have hereunto subscribed my name.

CHARLES P. HOLLERAN.