June 16, 1925. 1,542,597

A. H. BATES

SUCTION CLEANER

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Fig. 1

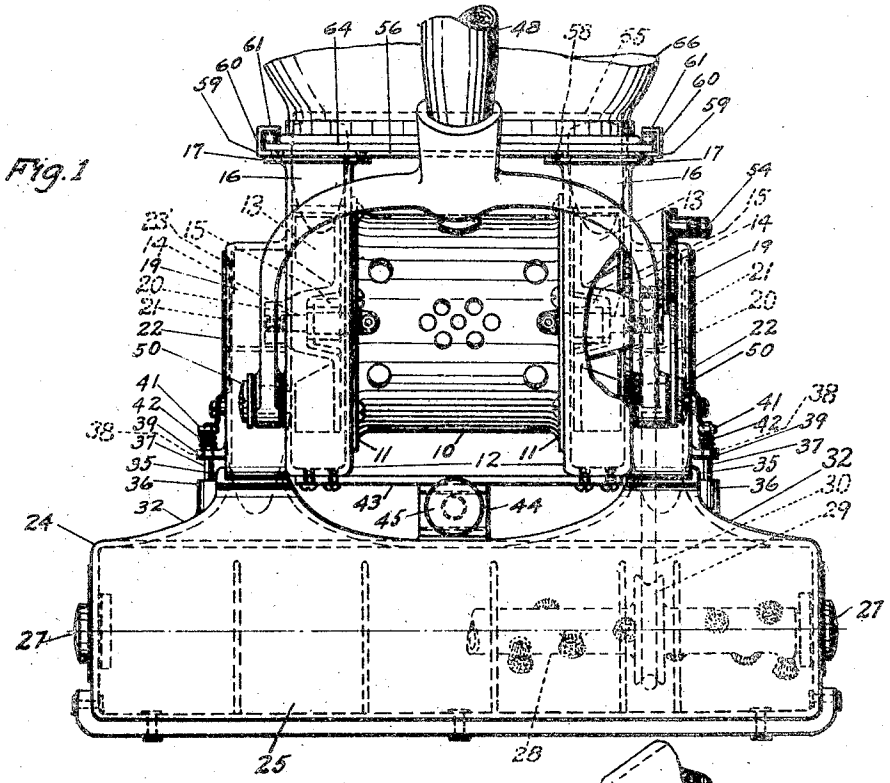
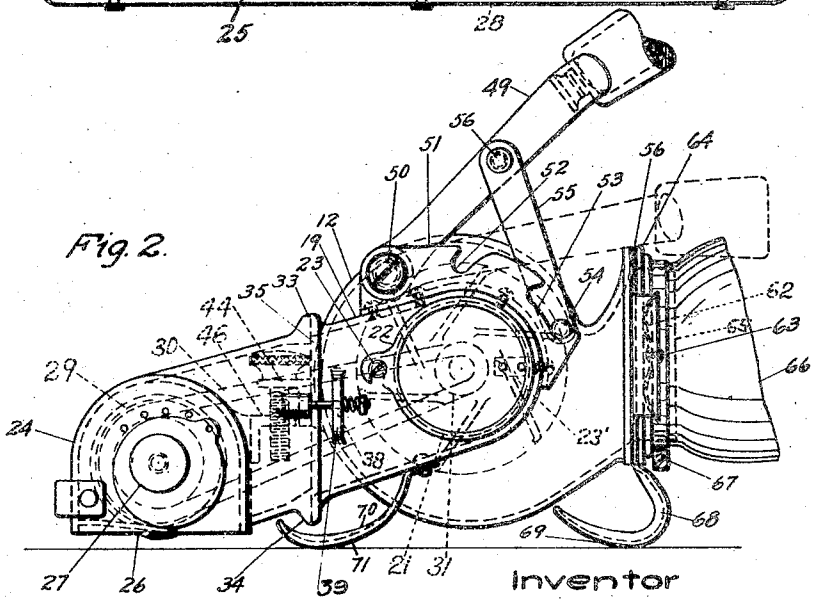


Fig. 2.



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Fig. 3.

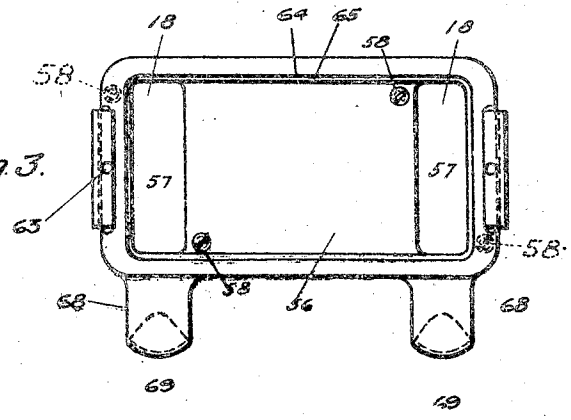



Fig. 4.

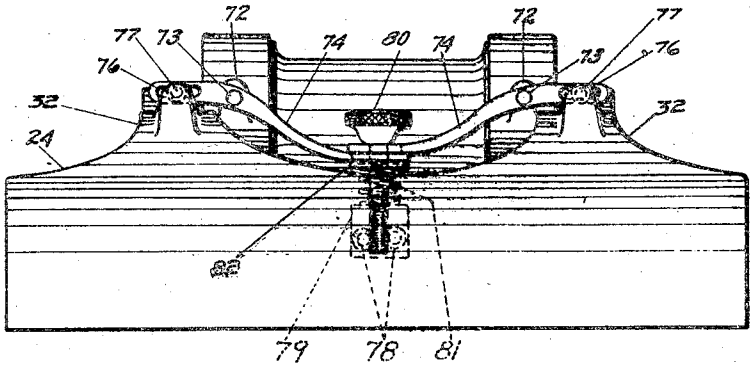
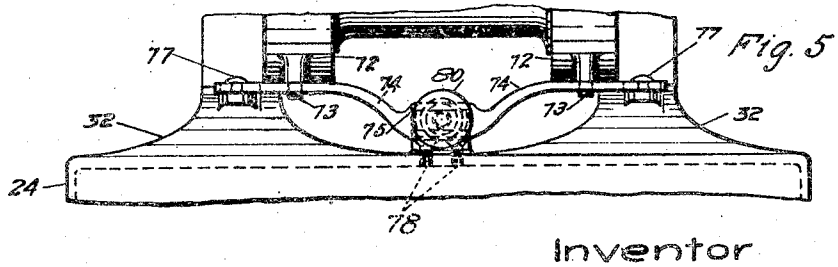



Fig. 5




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# UNITED STATES PATENT OFFICE.

ALBERT H. BATES, OF ELGIN, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE HOOVER COMPANY, OF NORTH CANTON, OHIO, A CORPORATION OF OHIO.

## SUCTION CLEANER.

Application filed May 13, 1922. Serial No. 560,536.

*To all whom it may concern:*

Be it known that I, ALBERT H. BATES, a citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Suction Cleaners, of which the following is a specification.

My invention relates in general to improvements in suction cleaners and in particular to the hand-propelled, light-weight, motor-driven-brush type, and has for an object the provision of a compact, efficient, hand-controlled suction-cleaner capable of being adjusted to the particular requirements of different weights and types of floor coverings without impairing the effectiveness of the machine.

Another object is to provide a suction-cleaner of the type having more than one fan with a nozzle-mouth having uniform suction throughout its length and with new and improved means for securing a dust-bag thereto.

A further object is to provide a suction-cleaner with a new and improved form of support.

Other objects will become apparent after a study of the following description and appended claims, and in the drawings forming a part thereof, wherein like reference characters refer to the same parts.

In the drawings:

Figure 1 is a plan view of my invention with parts shown by dotted lines;

Figure 2 is a side elevation of the same;

Figure 3 is a detail view of the bag adapter plate; with the bag ring attached thereto;

Figure 4 is a front elevation of my invention illustrating a modified form of nozzle adjustment; and

Figure 5 is a fragmentary plan view of the same.

In the drawings, a preferred embodiment of my invention is shown comprising a motor-casing 10 in the form of a hollow cylindrical body provided at each end with an outwardly-flaring flange 11 to which are secured the fan chambers 12, 12. Each fan chamber encloses a fan-rotor 13 mounted on the motor-shaft 14.

In order to lend compactness to the machine, the bearings for the motor shaft are mounted in bosses 15 extending into the fan-chambers and received in counter-bores formed in the fan rotors. Each fan-chamber is provided with an inlet opening 20 coaxial with the motor-shaft and fan-rotors and with a discharge-conduit 16 having a flanged terminus 17 forming an outlet 18.

Positioned on the outside of each fan-chamber is a conduit 19 connecting with the inlet opening 20 and extending downwardly and forwardly along the fan-chambers. Each conduit is provided with an aperture 21 registering with the inlet-openings 20 in the fan-chambers, which is normally closed by a plate 22 which is preferably secured to the conduit wall by means of a screw 23 engaging a resilient ear formed on the plate and a spring clip 23′.

In order to adjust the suction-nozzle relatively to the rest of the machine and accordingly to the floor upon which the machine is supported, I have provided a separate casting 24, the forward end of which forms the suction-nozzle 25 and is provided with a suction-mouth 26 formed in the bottom thereof and having apertured ends adapted to receive adjustable brush-supporting devices 27, the details of which form no part of my present invention.

Mounted in the said brush-supporting devices is a rotatable brush 28 provided with a pulley 29 over which is trained a belt 30, which in turn is driven by a pulley 31 mounted on one end of the motor-shaft 14. (See Figure 1).

In order to connect the suction-nozzle 25 with the conduits 19, 19, the casting 24, is provided with two hollow portions 32, 32, each of which flares forwardly in a symmetrical fashion so as to extend longitudinally at the forward end one-half the length of the suction-nozzle, thus insuring a uniform suction along the length of the suction-mouth. At the rearward end each portion 32, 32, at the top and bottom is provided with lips 33, 34, respectively, of thickened section, so as to allow the casting 24 to be shifted relatively to the conduits 19, 19, without causing a leak in the passageways formed by them.

In order to guide the casting in its up and down travel the outer rear edge of each portion 32, 32, is provided with a flange 35 which contacts with the outside wall of the conduit 19 with which it connects. To insure a tight joint between the meeting walls of the conduits 19, 19, and the portions 32,

32, of the casting 24, I have found it advantageous to provide some positive means for producing a firm contact. As an example of one way in which this may be accomplished, I have shown the outside wall of each portion 32 formed with a boss 36 in which a pin 37 is firmly mounted.

The pin 37 extends through a slot 38 formed in a lug 39 on the outside wall of each conduit 19, and has secured on the end thereof a nut 41 between which and the lug 39 is positioned a compression-spring 42 surrounding the pin.

In order to provide a simple and convenient means to raise and lower the nozzle mouth I have secured to the fan-chamber a bar 43 to which in turn is secured a bracket 44 in which is rotatably mounted a knurled-head screw 45, the threaded portion of which is received by a similarly-threaded aperture in a bracket 46 mounted on the rear of the suction-nozzle 25.

As a means for propelling the machine over a floor covering I have provided a handle 48 provided with a bail 49, each end of which is rotatably mounted on a pin 50 supported on the outside wall of the fan-chamber and a flanged-member 51 mounted on and curved to conform with the conduit 19. In order that the front or rear end of the machine can be raised as may be desired, or the handle locked in an upright position for convenience in storing, the flanged member 51 is provided with notches 52 and 53 adapted to receive a pin 54 firmly fixed in the free end of a link 55 pivoted at 56 to the handle bail. When the pin 54 is positioned in the notch 52 the handle will be locked in the upright position and may be stored in a minimum amount of space.

The notch 53 is of greater size and provides for an amount of play of the pin 54 therein corresponding to the angular movement of the handle during the normal operating of the machine.

When it is desired to lower the handle to a position parallel with the floor, the pin is lifted from the notch in which it happens to be, the link 55 hanging freely from the bail. By rotating the link 55 in a counter-clockwise direction until it lies above the pin 50, the entire controlling mechanism may be thrown out of operation so that the pin 54 cannot engage the notches 52 and 53.

For ease in emptying and for other reason, it is desirable that the dust-collecting bag be made with but a single opening having relatively-large dimensions. With this construction it is possible to eject the matted masses of dust, lint, and litter that are collected. With the construction shown, it is possible to easily detach the bag from the machine and place the bag ring on a sheet of paper where it can be held by the operator's feet. In this position the bag can be shaken and the contents emptied expeditiously and in a cleanly manner since the collected dirt is prevented from scattering. In order to use a bag of this construction in connection with a twin-fan machine having two discharge-openings, I have provided an adapter plate 56 in the form of a flat member provided with two apertures 57, 57, adapted to register with the discharge openings 18, 18, and secured to the flanged termini 17, 17, by means of screws 58. This plate is provided at each end thereof with an ear 59 composed of a portion 60 bent at right-angles to the main-body of the plate and a portion 61 bent back parallel thereto, and to the inner surface of which is secured a leaf-spring 62 by means of the rivet 63. The flange and spring co-act to guide and hold in position the bag-ring 64 which is in the form of a rectangular hollow frame provided with a flange 65 to which the bag 66 is clamped by means of the band 67.

The adapter-plate 56 is further provided near each end with a resilient extension 68 terminating in a smoothly-polished convex portion 69 adapted to contact with the floor and support the rear end of the machine. The forward portion of the machine is supported by a resilient member 70 secured to the under side of each conduit 19 and provided with a convex-portion 71 adapted to contact with the floor coverings.

Figures 4 and 5 illustrate a suction cleaner with parts omitted and show a modified form of nozzle adjustment in which the forward side of each fan chamber is provided with a boss 72 in which is firmly fixed a pin 73 on which is pivotally mounted a lever 74 one arm of which extends toward the center of the machine and is bifurcated at the end as at 75, the other end being slotted as at 76 to receive a pin 77 mounted in a boss on the top of portion 32.

Secured to the rear wall of the suction-nozzle 25 by means of screws 78 is a centrally screw-threaded block 79 adapted to receive a knurled-head thumb-screw 80, the stem portion of which passes through the overlapping bifurcated ends of the levers 74 and which operates to raise the suction-nozzle when the screw is turned into the block.

In order to assist gravity in returning the sution-nozzle to the lowest position, the screw 80 is surrounded by a compression-spring 81, one end of which rests upon the block 79 and the other abuts against a washer 82 positioned on the screw 80 below the bifurcated ends of the levers. This spring normally tends to force the nozzle to its lowermost position.

I claim:

1. In a suction-cleaner, a motor, a pair of distinct suction-creating fans each having a separate inlet conduit, a suction-nozzle having a pair of discharge-conduits in

registry with said inlet-conduits respectively, said discharge and inlet conduits having complemental guide means to permit sliding movement of one with relation to the other, means for holding the ends of said discharge and inlet conduits together in operative position, an adjusting screw, and means for connecting said screw with said nozzle and said fan casing respectively to effect vertical adjustment of said nozzle upon rotation of said screw.

2. In combination with a suction-cleaner provided with two distinct suction-creating devices each having an inlet-conduit, a cleaning-nozzle provided with two discharge-passages arranged symmetrically with respect to the length thereof and registering with said inlet-conduits, said cleaning-nozzle being held resiliently in contact with said inlet-conduits.

3. In combination with a suction-cleaner provided with two distinct suction-creating devices, each having an inlet-conduit, a cleaning-nozzle provided with two discharge-passages arranged symmetrically with respect to the length thereof and registering with said inlet-conduits, the discharge-passages of said cleaning nozzle being provided with guides engaging the side-walls of said inlet-conduits and being capable of relative movement therewith.

ALBERT H. BATES.