

Sept. 2 , 1924.

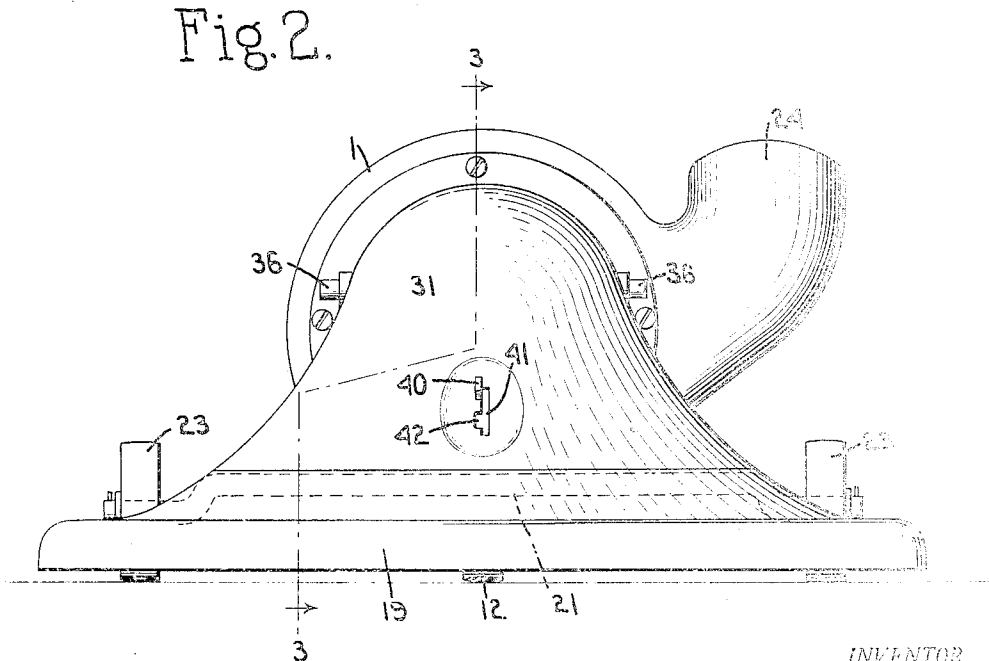
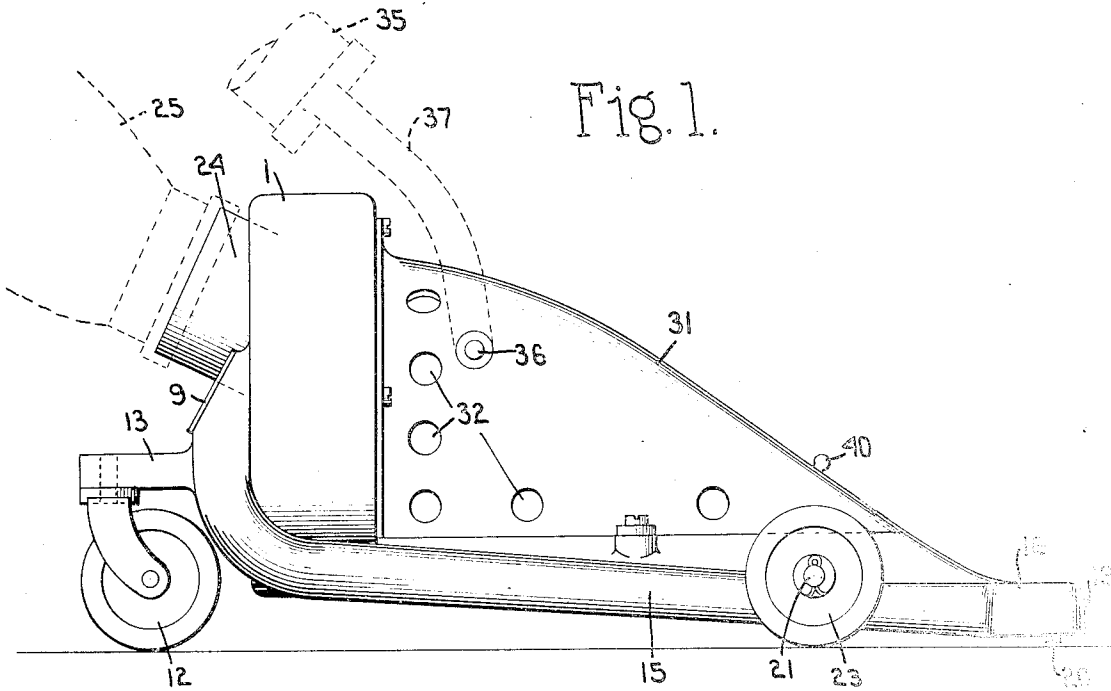
1,506,850

W. V. ORR

SUCTION CLEANER

Filed Aug. 4. 1921

3 Sheets--Sheet 1



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BY

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Fig. 3.

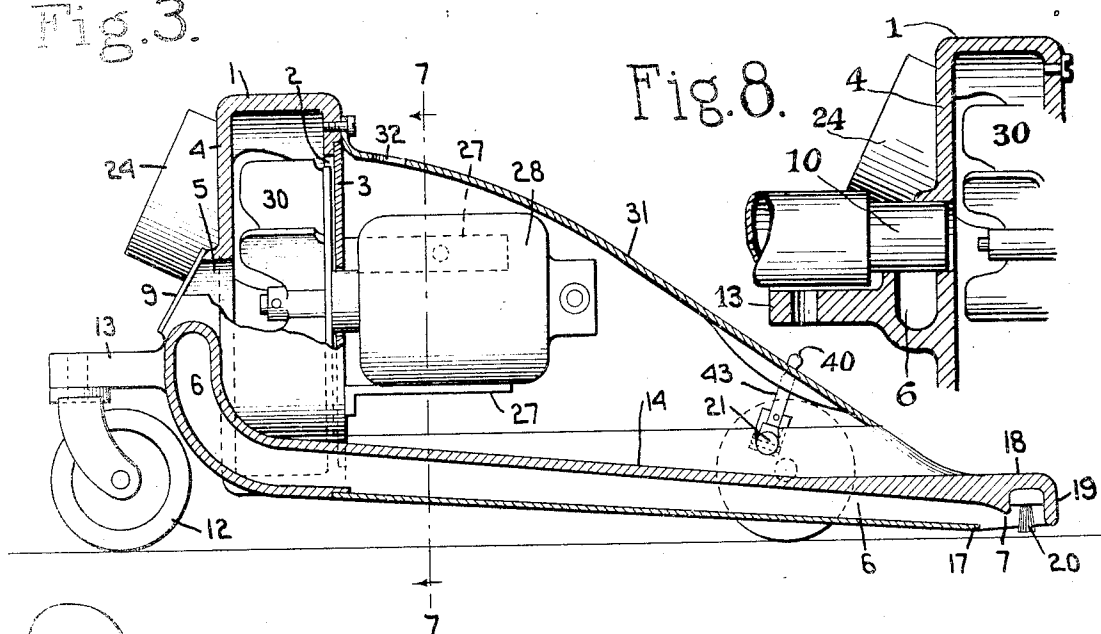


Fig. 8.

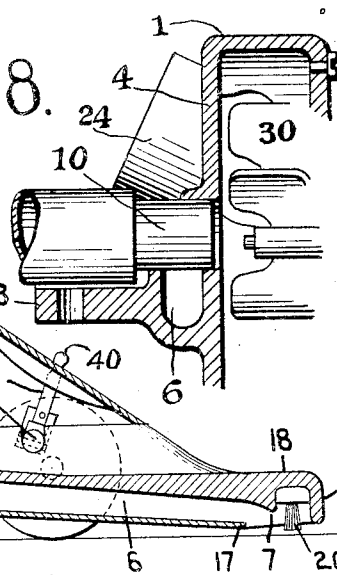
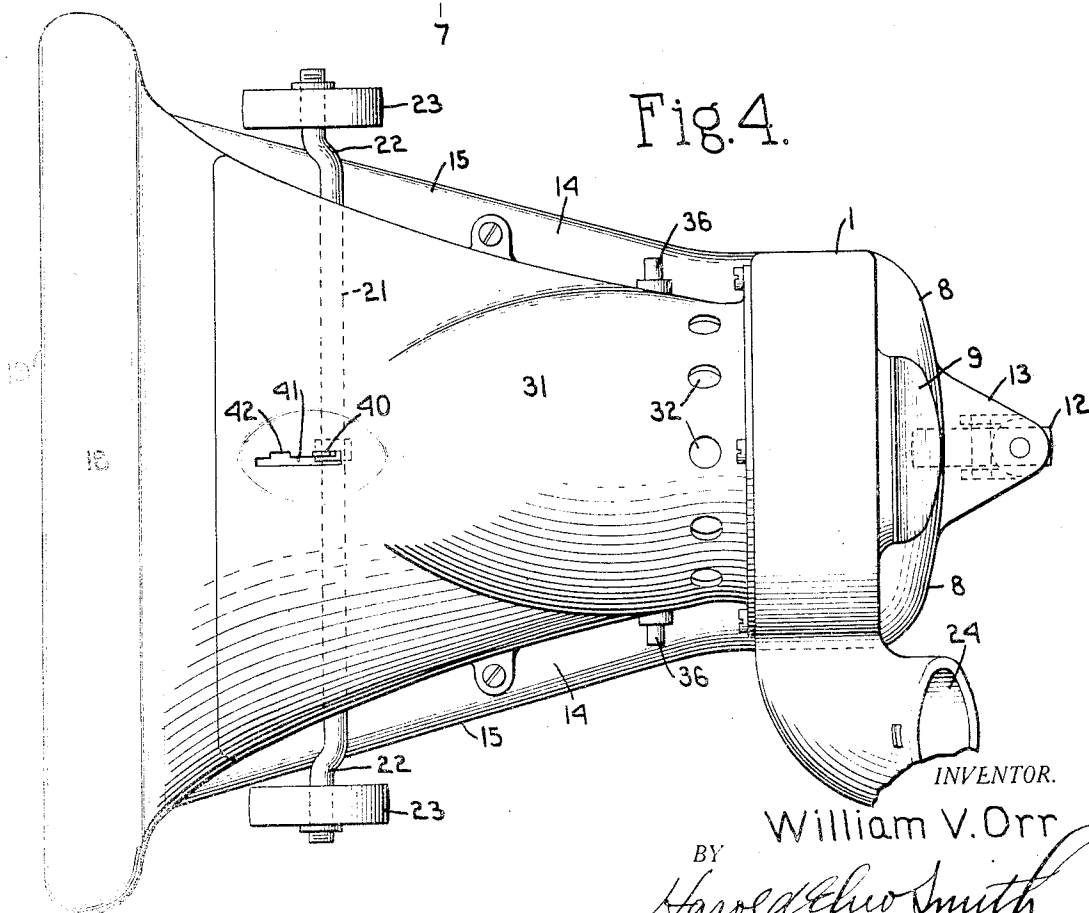


Fig. 4.



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Fig. 5.

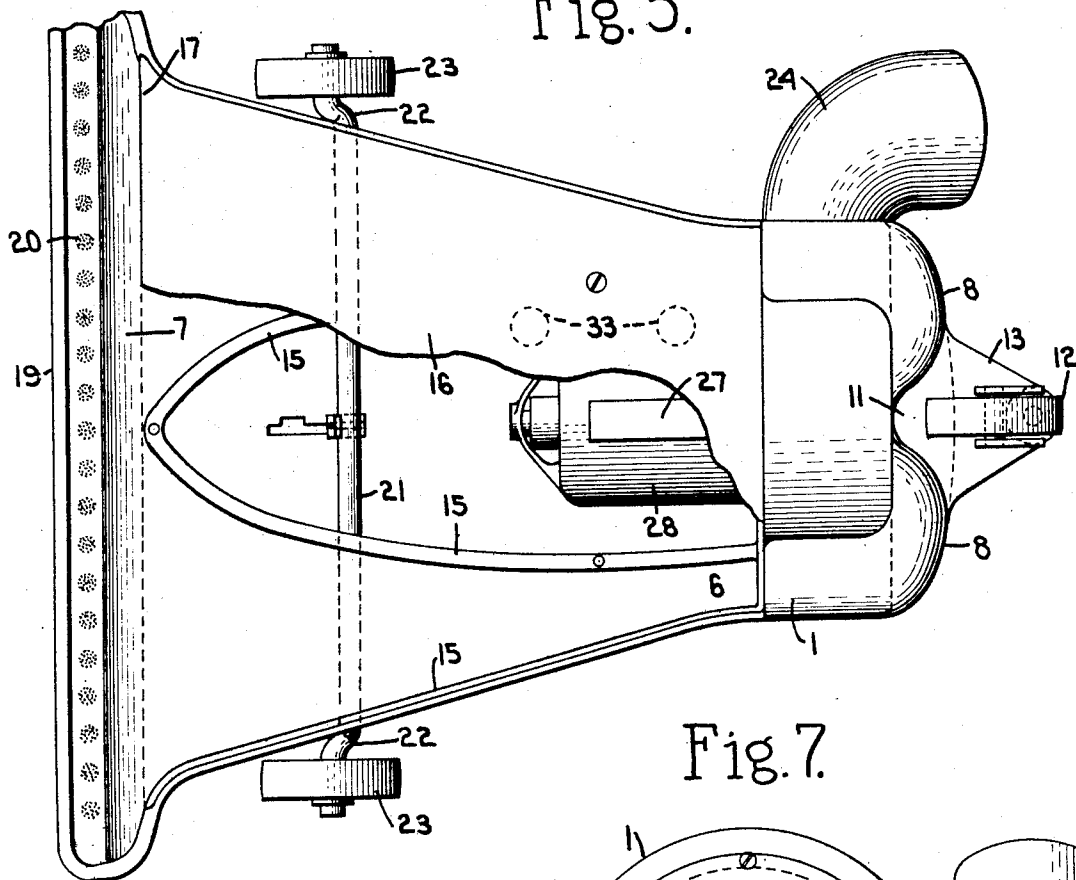


Fig. 7.

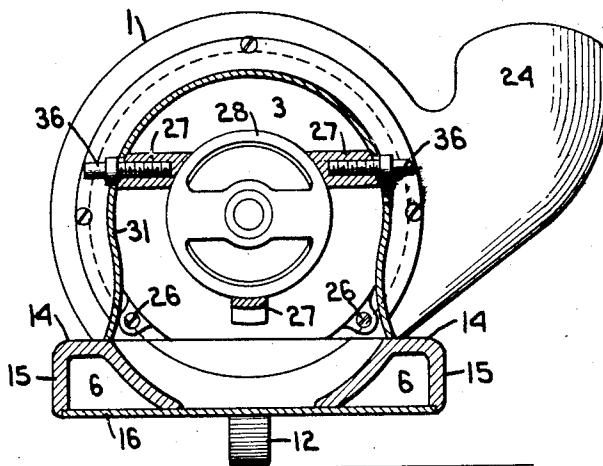
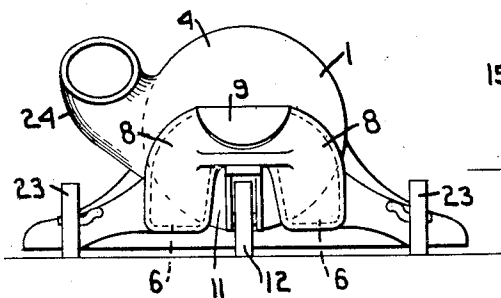


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM V. ORR, OF CLEVELAND, OHIO.

SUCTION CLEANER.

Application filed August 4, 1921. Serial No. 489,680.

To all whom it may concern:

Be it known that I, WILLIAM V. ORR, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Suction Cleaners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to suction cleaners and has for its objects the provision of a device of this character which shall have a minimum height so as to be insertable below furniture, together with a maximum of stability to resist overturning; which shall be constructed with a minimum number of parts, with a maximum of simplicity in casting and with a minimum of machine work; the provision of an arrangement of parts which shall cooperate with unusual effectiveness for the removal of dust and litter; the provision of a device having improved facilities for the attachment of an extension hose; the provision of a suction cleaner possessing a totally new arrangement of motor, fan, and nozzle; while further objects of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application Fig. 1 represents a side elevation and Fig. 2 a front elevation of my improved cleaner; Fig. 3 is a horizontal sectional view taken upon the line 3—3 of Fig. 2; Fig. 4 is a top plan view of the cleaner; Fig. 5 is a bottom plan view with a part of the bottom plate broken away; Fig. 6 is a rear elevation drawn to a reduced scale; Fig. 7 is a cross section corresponding to the line 7—7 of Figs. 1, 3, 4 and 5; and Fig. 8 is a detail view illustrating the mode of attaching an extension hose.

Describing the parts by reference characters, 1 represents the fan chamber which is preferably made of cast aluminum with its axis horizontal and having at its forward side a circular opening 2 adapted for the reception of the motor base 3, and having its rearward wall 4 formed with a central inlet opening 5. Communicating with this inlet opening are two converging passage-ways 6 which extend past the two lower quarters of the fan casing and thence forwardly to the extreme end of the cleaner nozzle, said passage-ways growing wider toward the forward end until they meet at

the inlet mouth 7. The rearward part of each passage-way is formed in a thickened boss 8 integral with the fan-chamber casing, these bosses being provided at their junction with a removable cover 9 for which can be substituted an extension hose connection 10, applied immediately to the inlet opening 5 so as to automatically cut off the flow from the passage-ways 6, as shown in Fig. 8. Immediately below this opening the two branches are spaced apart to provide a notch 11 for the accommodation of the caster 12 which is pivoted to a bracket 13 cast upon the bosses at this point. Forward of the fan chamber casing the passage-ways 6—6 are preferably formed as open bottomed channels, the tops 14 and sides 15 of such channels being integral with the fan casing, but the bottom thereof being formed by a removable plate 16 of appropriate shape detachably secured thereto, its forward end constituting the rear lip 17 of the inlet mouth 7. The roof 18 and forward lip 19 of this inlet mouth are integral with the fan chamber casing, provision being made for a suitable brush, if desired, such as that shown at 20. Journalled across the top of the nozzle is a rock-shaft 21 having cranked end-portions 22—22 on which are journalled the carrying wheels 23—23 which support the forward end of the cleaner. Projecting tangentially and also rearwardly from the fan casing 1 is the outlet neck 24 adapted for the reception of the dust bag 25. This brings the inlet and the outlet openings of the fan chamber on the same side thereof with each other and on the side opposite the motor and nozzle. It will be understood that it is equally within my invention to make the channels by casting about cores in the usual manner.

The base 3 which carries the motor is rigidly secured across the opening 2 by means of suitable screws 26—26, and is formed with studs 27 to which is attached the frame of the electric motor indicated generally at 28. The shaft of this motor is approximately parallel to the plane defined by the wheels 13 and 23 and perpendicular to the direction of the inlet mouth and coincides with the axis of the fan chamber into which it projects, being there provided with a suitable fan 30. Detachably secured to the front of the fan chamber and the top of the air channels is a housing 31 which,

within the scope of this invention, may assume any desired form, but preferably slopes forwardly and simultaneously flares laterally so as to possess an attractive appearance. This cover may be provided with openings 32 for ventilating the motor, or may be left imperforate if desired; and the bottom plate 16 may also be provided with perforations shown at 33 in Fig. 5. In order to secure the handle 35 to the cleaner casing I have shown the two topmost studs 27 as formed at equal heights one at each side of the motor, and threaded for the reception of the trunnions 36—36 which project at opposite sides of the cover 31 and have the handle forks 37 detachably sprung thereon.

Any suitable means can be employed to secure the rock-shaft 21 in adjusted position, the preferred means consisting of an arm 40 pivoted transversely of the shaft and projecting through a slot 41 formed therein, one side of said slot being formed with notches 42 to receive this arm and the arm itself being provided with a spring 43 which tends to force it into these notches.

When constructed as shown herein the coring and casting are very simple; only one aluminum casting is required; the bottom plate 16 and top cover 31 can be formed of stampings; and the only machine operation necessary is the truing up of the aperture 2 for the reception of the motor base 3 and the boring and tapping of the holes for the attachment of the assembling screws. The air passage-ways 6—6 are so deepened vertically, combined with their gradually decreasing width rearwardly as to possess substantially the same cross-sectional area at all points, so that the air passing there-through may exhibit no eddies or pockets. As a result all dust and litter carried into the suction mouth acquires a very great velocity while moving along the substantially horizontal part of the passage-way with the result that comparatively heavy articles are elevated into the fan chamber without difficulty. By virtue of the low dust fan effect there is practically no direct lifting of the litter at the inlet mouth but the air blowing across the top of the carpet from the forward lip 19 (which is preferably elevated slightly above the rear lip for this purpose) sweeps the litter up a gradual incline only until the same arrives at a point where the air stream is so deep and strong that it is elevated without difficulty. Furthermore by making the motor and motor housing in this manner, the motor can be thoroughly ventilated, and its operation can be observed and adjusted without removing it from the fan chamber as is necessary in most cleaners.

It will be understood that the bottom of the nozzle can be cast integral with the

top thereof in the usual way if desired; also that a cast metal top can be used instead of a stamping; that the handle can be secured at other points and in other modes; that I do not restrict myself to a construction wherein the nozzle is integral with the fan chamber or wherein the top plate is separate from the nozzle; and in general that many changes in detail and arrangement of parts can be made without departing from the scope of my inventive idea as defined in the annexed claims.

Having thus described my invention, what I claim is:

1. In a suction cleaner, a casing having a fan chamber, a motor, and a collecting nozzle, carrying wheels supporting said casing with the axis of said fan chamber substantially horizontal and its periphery near the floor, said nozzle having a narrow elongated inlet mouth arranged transversely of that axis, and the bottom of said nozzle slanting gradually upward from said inlet mouth, said motor being located upon the same side of said fan chamber with said nozzle and said fan chamber having an inlet opening on the opposite side from said motor, and an air passage-way leading from said inlet mouth past said fan chamber to said inlet opening.

2. In a suction cleaner, a casing having a collecting nozzle, a motor, and a fan-chamber arranged in the order stated from front to rear, said fan chamber having its axis substantially horizontal and having an inlet opening in the side opposite said nozzle, and a dust bag connected to the outlet from said fan chamber and located on the opposite side thereof from said motor.

3. In a suction cleaner, a casing having a collecting nozzle, a motor, and a fan-chamber arranged in the order stated, said fan chamber having both an inlet opening and an outlet opening on the side opposite said motor, and said casing having a passageway leading around said fan chamber from said nozzle to said inlet opening.

4. In a suction cleaner, a casing having a collecting nozzle, a motor, and a fan chamber arranged in the order stated, said fan chamber having both an inlet opening and an outlet opening on the side opposite the motor, said casing having two branched passageways leading from said nozzle to said inlet opening and passing one at each side of said fan chamber.

5. In a suction cleaner, a casing having a fan chamber, a collecting nozzle, and two passageways leading from said nozzle to the inlet of said chamber, a motor located between said passageways, and a dust bag attached to the fan chamber outlet and located on the opposite side of said fan chamber from said motor.

6. A suction cleaner having its collecting

nozzle and driving motor on the one side of the fan chamber, the inlet and outlet openings of the fan chamber being on the opposite side thereof, from the motor, and a dust bag connected to said outlet.

7. In a suction cleaner, a casing having a fan chamber, a motor, a collecting nozzle, and a passageway connecting said nozzle to the inlet opening of the fan chamber, said motor and nozzle being located at the forward side of the fan chamber and said inlet opening upon the rearward side of said fan chamber, and said passageway having a removable cover near said inlet opening, in combination with a hose connection adapted to be secured in direct communicating relation with said opening and to cut off the suction from said passageway.

8. In a suction cleaner casing, a cast metal fan chamber having an inlet opening, a collecting nozzle having its top side integral with said fan chamber and its bottom side formed with one or more open channels which communicate with said opening, and a bottom plate detachably secured to said nozzle and completing said channels.

9. In a suction cleaner casing, a cast metal fan chamber having integral there-

with the top, sides, and forward lip of a collecting nozzle, in combination with a separately formed bottom plate which completes said nozzle and has an edge spaced from said first lip to define an inlet mouth, the opposite part of the nozzle interior communicating with the interior of said fan chamber.

10. In a suction cleaner casing, a collecting nozzle having a narrow elongated inlet mouth and two spaced passageways extending therefrom at right angles to the length of such mouth, a fan chamber located between said passageways, said fan chamber having a single central inlet opening on the side opposite said nozzle communicating therewith, and also having at its periphery an outlet neck turned away from said nozzle and adapted to receive a dust bag.

11. A suction cleaner casing, comprising a rigid body having a fan chamber and a nozzle, said chamber having its inlet and outlet openings on the same side and said nozzle being located on the opposite side of said fan chamber from said openings.

In testimony whereof, I hereunto affix my signature.

WILLIAM V. ORR.