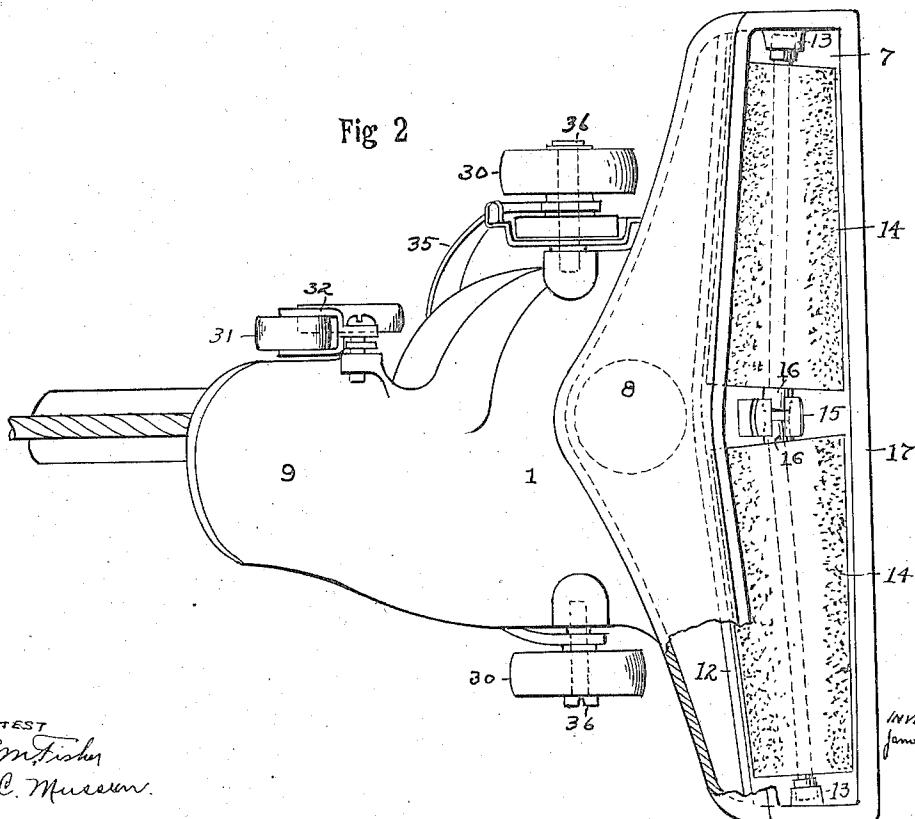
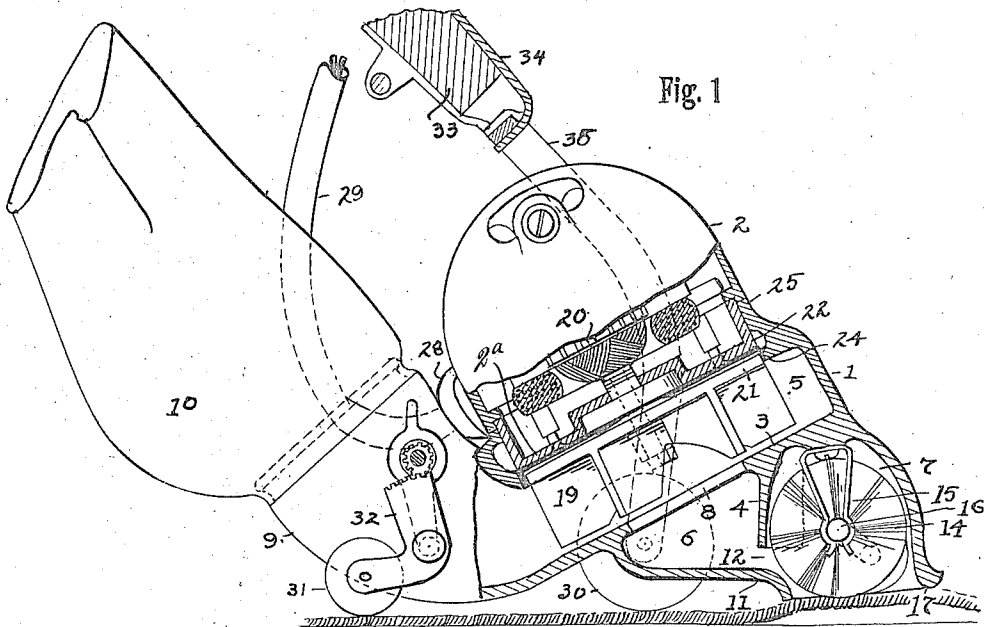


J. B. KIRBY.
VACUUM CLEANING MACHINE.
APPLICATION FILED SEPT. 15, 1913.

Patented Dec. 26, 1916.
2 SHEETS—SHEET 1.

1,209,720.



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Fig. 3

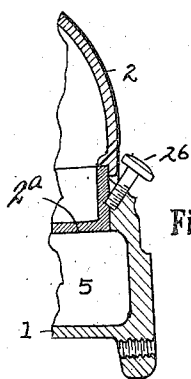
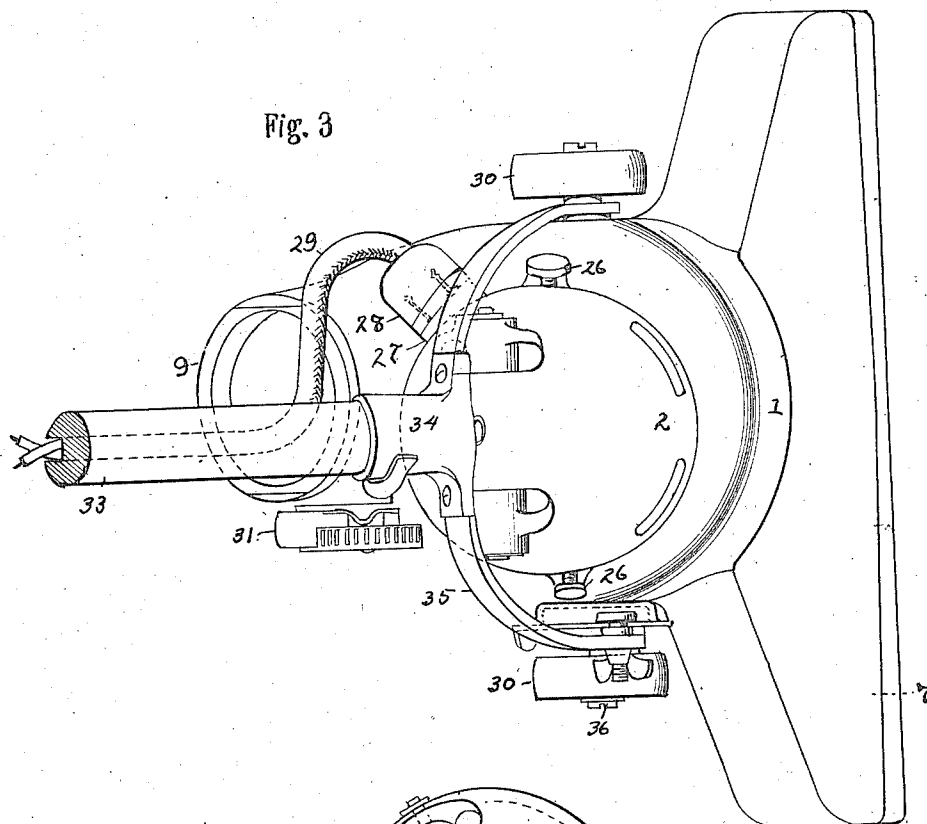


Fig. 6

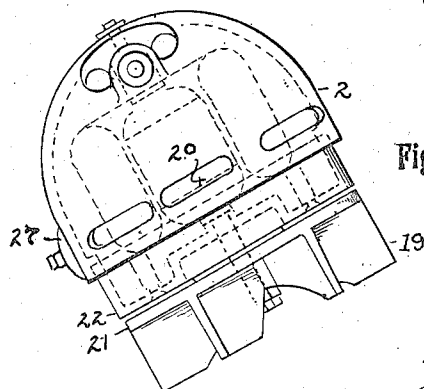


Fig. 4

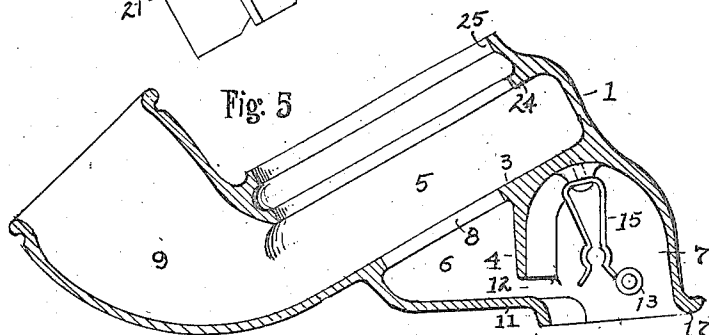


Fig. 5

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UNITED STATES PATENT OFFICE.

JAMES B. KIRBY, OF CLEVELAND, OHIO.

VACUUM CLEANING-MACHINE.

1,209,720.

Specification of Letters Patent.

Patented Dec. 26, 1916.

Application filed September 15, 1913. Serial No. 789,745.

To all whom it may concern:

Be it known that I, JAMES B. KIRBY, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Vacuum Cleaning-Machines, of which the following is a specification.

This invention relates to a vacuum cleaning machine of the portable type and has for its objects the provision of a machine of great simplicity and efficiency; the provision of a machine wherein the suction shall be distributed substantially uniformly over the entire inlet mouth; the provision of new and improved brushing or dust agitating mechanism; the provision of expedients whereby such brush or agitating mechanism may be rendered self-cleaning and the accumulation of lint and hair thereon prevented; while further objects and advantages of my improvement will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have illustrated one form wherein my invention is embodied, although it will be understood that this is only one of the many forms whereby the benefits of my improvements can be secured.

In these drawings, Figure 1 is a side elevation and sectional view of the machine with the upper end of the handle and dust bag omitted; Fig. 2 is a bottom view of the machine with the dust bag removed and a portion of the casing broken away; Fig. 3 is a top plan view of the machine; Fig. 4 is a side view of the dome section which carries the motor and fan; Fig. 5 is a sectional view of the main casing with the dome section and the brushes removed; and Fig. 6 is a detail view showing the means for securing the dome section upon the main casing.

This vacuum cleaning machine is of the type wherein a casing carrying a motor, a suction fan, and a collecting nozzle is mounted upon carrying wheels and propelled and guided by a handle so that the collecting nozzle may be presented to every part of a floor or the like which is to be cleaned. This casing comprises a hollow body 1 and a top section 2. The hollow body has therein a fan chamber 5 of generally cylindrical form, a suction chamber 6 of substantially triangular form, and a brush chamber 7 of elongated

gated shape. This brush chamber is contained in what is ordinarily called the nozzle of the cleaner and preferably has a length considerably greater than the diameter of the fan chamber as shown in Figs. 2 and 3. The suction chamber 6 communicates with the fan chamber by means of a circular opening 8 arranged centrally of the fan chamber and communicating with the apex of the suction chamber; and also communicates with the brush chamber 7 by way of the elongated narrow slot 12 whose height is much less than that of the suction chamber and whose length is substantially or quite as great as that of the suction chamber. It will be seen that the separation of the suction chamber and brush chamber is effected by a wall or partition 4 which depends from the wall 3 which forms the top of the suction chamber. The bottom of the brush chamber 7 is omitted forming an inlet mouth whose forward lip 17 is defined by the front wall of this chamber and whose rearmost lip is carried by the wall 11 which forms the bottom of the suction chamber 6. The slot 12 is therefore located immediately adjacent to this inlet mouth throughout the entire length of the same so that the suction effect thereon is rendered substantially uniform throughout its entire length; in addition to which the peculiar relation between the slot and the brush with which the brush chamber is provided produces certain additional peculiar and unexpected advantages which will hereafter be described.

The top section 2 contains the motor and carries the fan and is securely attached to the hollow body 1 as will be hereafter described. In the present embodiment this top section is supported at an inclination to the vertical in order to reduce the height of the machine and increase its stability, although the peculiar things herein described and claimed are not limited to that construction of device or to any particular construction, location or inclination of motor. The rearward part of the body 1 is formed with an outlet neck 9 communicating with the peripheral part of the fan chamber and having its end upwardly turned for connection to the dust bag 10 as usual in such machine. The end walls of this nozzle are provided with suitable shaft bearings 13 for the reception of the rotatable brushes 14. A downwardly-projected spring clamp 15 at the

middle of the chamber 7 supports the inner shaft ends 16 of the brushes which are preferably round and tapering and situated with their larger ends opposite each other. The bottom opening of the brush chamber conforms in outline to the taper of the brushes, and both brushes are axially inclined relatively to both a perpendicular and horizontal plane to bring the peripheral surfaces at the front and bottom of the brushes substantially flush and parallel with the bottom front edge 17 of the nozzle. The nozzle does not ride upon the floor but is elevated therefrom more or less as conditions may require. However, the carpet or other article which is being cleaned is usually lifted into engagement with the nozzle and the brushes by the suction of the fan, and the brushes are rotated by contact with the surface being cleaned or in any other suitable manner. In the present embodiment I have illustrated no special means for driving these brushes since it is a known fact that conical brushes when moved in a parallel manner across a horizontal surface exercises a definite sweeping action owing to the tendency of their different parts to rotate at unequal speeds. The particular advantages of construction and operation herein described and claimed are independent in large degree of the construction or mode of operation of the brushing members or even of whether they be movable at all since certain of my claims apply to stationary brushes.

The narrow shape of the slot 12 combined with its location near the lower part of the brush prevents any lint, hair, or the like from becoming drawn into and entangled with the brush as is the case when the brushing device is located in the midst of the air stream; and in addition the location of this slot at the particular point illustrated causes any lint or thread picked up thereby to be stripped therefrom so that the brush becomes practically self-cleaning. The wall 4 is preferably placed very close to this brush throughout the whole length of the nozzle to utilize the suction at the slot to the best advantage in this cleansing process.

The lower end of the section 2 is provided with a removable closure 2^a having a cylindrical exterior 22 of a size to fit within the opening 25 of the casing top, one or more inclined set screws 26 being conveniently employed to secure it in place as shown in Figs. 3 and 6. The armature shaft has a bearing in this closure and projects there-through, its length being provided with the fan 19 whose base 21 is located immediately adjacent to this closure. Preferably also the interior of the casing is formed with a flange or shoulder 24 adapted to embrace closely the fan base 21 and prevent the penetration of lint or dust behind the fan. This arrangement of the parts permits the power

plant to be removed with great ease in case of clogging or obstruction and without disturbing the working parts. I have shown the electrical connections as comprising a detachable plug 27, 28 carried by the dome section and cable 29 respectively the better to facilitate this disconnection.

The supporting mechanism for the machine comprises two main wheels 30 at the sides of the casing and a single vertically adjustable rear wheel 31 carried by a suitable arm 32. The propelling and guiding mechanism comprises a handle 33 detachably secured by a clamping socket 34 to a fork 35 connected to the casing in any suitable manner as by being pivoted to the screws 36 which support the wheels 30. The particular things herein sought to be protected are wholly independent of these features and it will be obvious that many changes in these and other details of construction can be made without departing from the scope of my invention which is defined in the claims hereto annexed.

Having thus described my invention, what I claim is:

1. In a vacuum cleaning machine, a hollow body having therein a fan chamber, a brush chamber, and a triangular suction chamber located therebetween, there being a central opening into said fan chamber communicating with the apex of said suction chamber, and a wall between said suction chamber and brush chamber defining a communicating slot which is narrower than the suction chamber and extends throughout substantially the entire length of said suction chamber upon the side opposite said opening, the length of said slot being greater than the diameter of said fan chamber.

2. In a vacuum cleaning machine, a casing having three chambers therein consisting of a circular fan chamber, a wedge shaped suction chamber, and an elongated brush chamber, the fan chamber and suction chamber being connected by an opening at the point of the wedge, and the suction chamber and brush chamber being connected by an elongated slot along the base of the wedge, said slot being narrower than the suction chamber and closely adjacent to the mouth of the brush chamber.

3. In a vacuum cleaning machine, a casing having a circular fan chamber inclined relatively to a horizontal plane and provided with an elongated collecting nozzle transversely arranged beneath the elevated portion of the same and communicating with the central part of the fan chamber, the length of said nozzle being greater than the diameter of said fan chamber, an inclined motor receiving dome of smaller diameter than the fan chamber secured to the top thereof and projecting rearwardly

at the same inclination, said casing also having a wall depending inside said nozzle between its inlet mouth and the fan chamber opening, and defining a suction chamber, there being an elongated passageway past said wall throughout the entire length thereof which is narrower than the height of said suction chamber.

4. In a vacuum cleaning machine, a base section having a fan chamber, a suction chamber, and an extended brush chamber, the bottom of said brush chamber being open and tapering from the middle to its ends, in combination with a pair of round tapering brushes removably mounted within said brush chamber.

5. In a vacuum cleaning machine, a casing having a fan chamber and a brush chamber extended transversely at either side thereof, and provided with an elongated suction chamber between said fan chamber and the brush, in combination with a pair of round tapering brushes mounted with their larger ends opposite each other in said brush chamber.

6. In a vacuum cleaning machine, a casing having a fan chamber and a brush chamber in open communication therewith, the bottom of said brush chamber being open, in combination with round tapering brushes rotatably mounted within said brush chamber, the axes of said brushes being inclined relatively to a horizontal plane to aline the bottom surface of the brushes parallel with the open bottom of the brush chamber.

7. In a vacuum cleaning machine, a casing having a fan chamber and a brush chamber, in combination with a pair of round tapering brushes rotatably mounted in reverse relations within said brush chamber with the front and bottom faces of the

brushes substantially parallel with vertical and horizontal planes respectively.

8. In a vacuum cleaning machine, the combination of a casing having therein a cylindrical fan chamber having a central inlet opening, a suction chamber of generally triangular shape communicating with said opening at its apex, and an elongated brush chamber located along the base of said suction chamber, said brush chamber having a downwardly facing inlet mouth, and a brush mounted within said brush chamber with its rear surface adjacent to the wall of said suction chamber, there being a narrow elongated slot between said suction chamber and brush chamber at a point near said mouth and adjacent to the lower part of said brush.

9. In a vacuum cleaning machine, a casing having a fan chamber and an elongated brush chamber in open communication, shaft bearings in the ends of said brush chamber, and a double shaft bearing in the center of said brush chamber, in combination with a pair of rotatable brushes having shaft extensions removably engaged with said bearings.

10. In a vacuum cleaning machine, a nozzle carrying section having a fan chamber with an axial hollow neck, in combination with a motor and fan and a supporting section therefor having a reduced cylindrical extension removably seated within said neck end, and threaded means traversing said neck and engaging said extension to lock said sections together.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES B. KIRBY.

Witnesses:

F. C. MUSSUN,
E. M. FISHER.