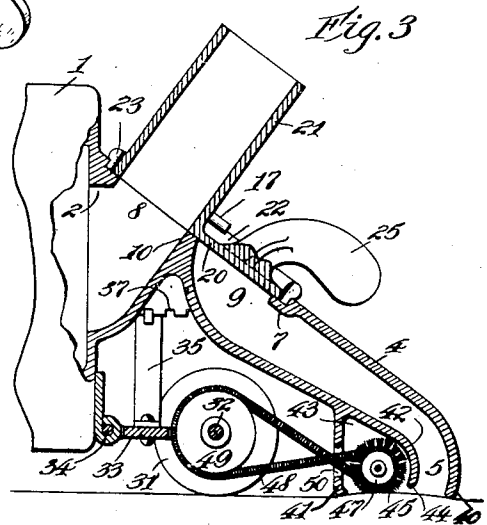
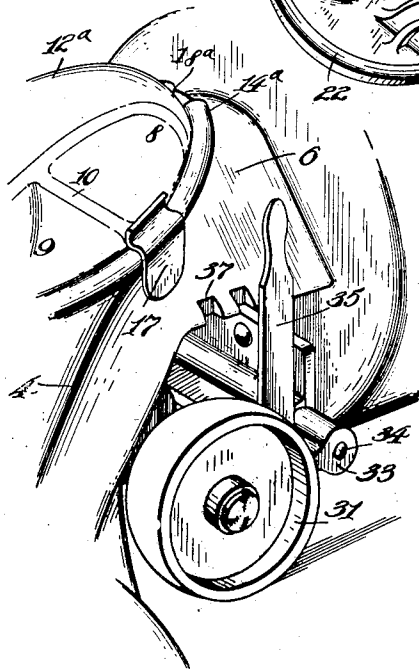
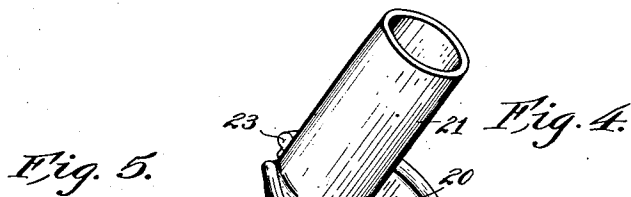
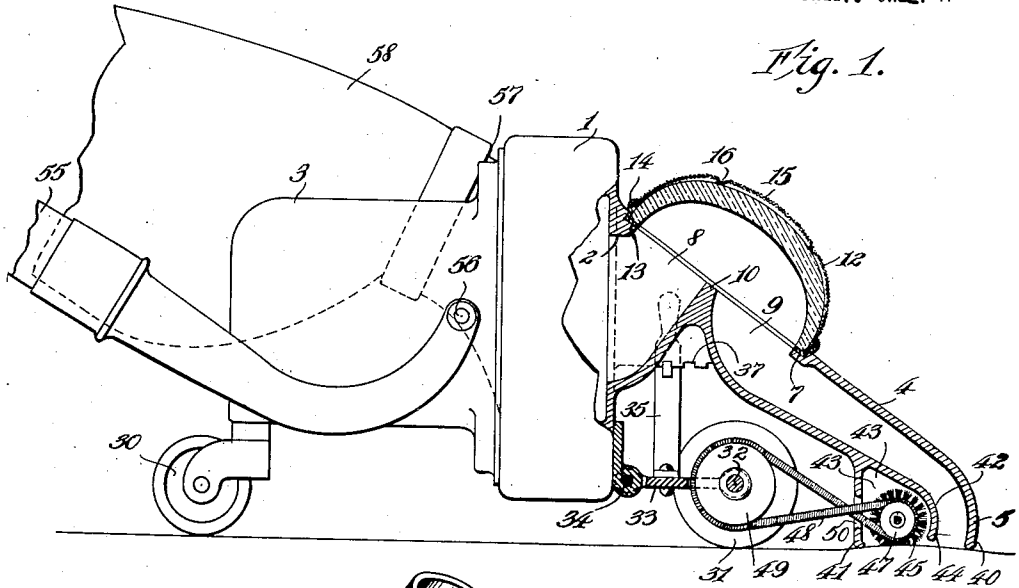


J. B. KIRBY.
 SUCTION CLEANER.
 APPLICATION FILED JULY 9, 1915.

1,347,166.

Patented July 20, 1920.
 2 SHEETS—SHEET 1.



INVENTOR,
 James B. Kirby
 BY Hull Smith Brock & West.
 ATTYS.

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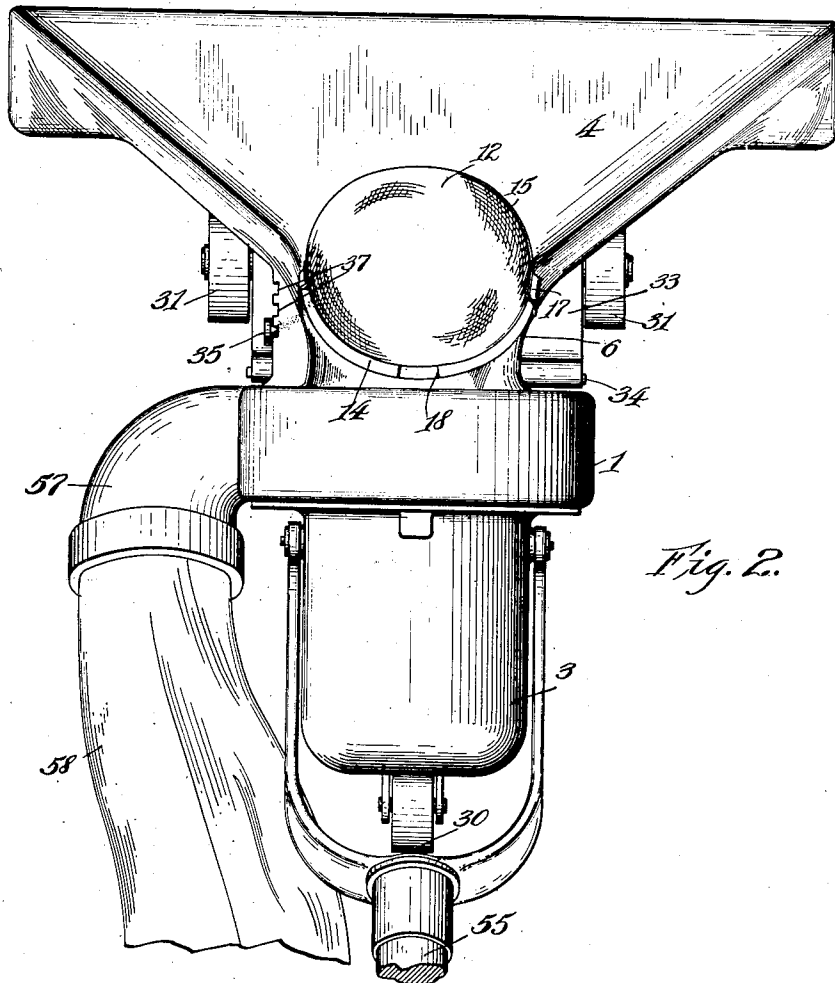


Fig. 2.

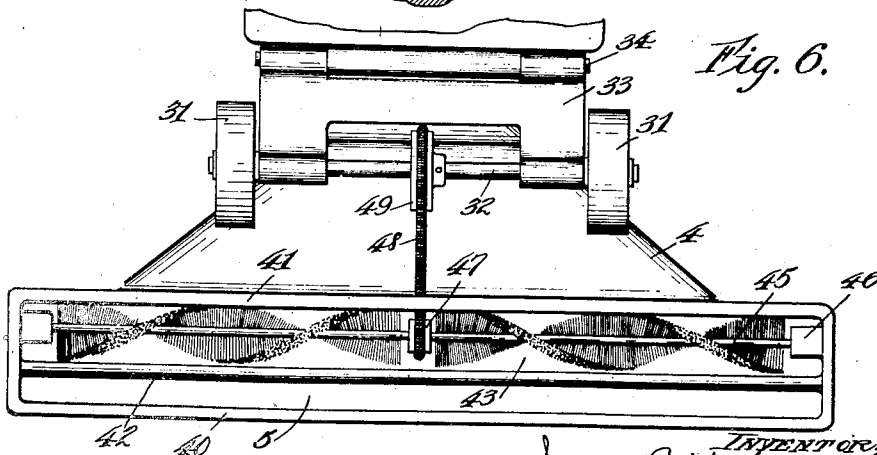


Fig. 6.

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UNITED STATES PATENT OFFICE.

JAMES B. KIRBY, OF CLEVELAND, OHIO, ASSIGNOR TO ELECTRIC VACUUM CLEANER COMPANY, INC., A CORPORATION OF NEW YORK.

SUCTION-CLEANER.

1,347,166.

Specification of Letters Patent.

Patented July 20, 1920.

Application filed July 9, 1915. Serial No. 33,862.

To all whom it may concern:

Be it known that I, JAMES B. KIRBY, 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 of the portable type wherein an electrically operated suction device having a collecting nozzle carried rigidly thereby is moved around over the floor or other surface to be cleaned so as to suck the dust and dirt therefrom and eject it into a bag or other separator which retains the dirt and allows the escape of the air. Experience shows that it is extremely convenient to employ a transparent window or inspection cover in connection with such a device since the rapidity and certainty of doing work therewith is much enhanced thereby; also it is extremely convenient to employ on certain occasions an extension hose or conduit whereby curtains, wall paper, books, and upholstery can be cleaned with an extension tool; also that different floor coverings are best cleaned with the suction nozzle arranged at varying heights; and finally that lint, threads, dressmaker's scraps, and certain other material can be dislodged only by means of some kind of agitating device. Accordingly the objects of this invention are the provision of a new and improved construction and arrangement of inspection window; the provision of new and improved arrangement and location of hose connection; the provision of a new and improved elevation adjuster; the provision of a new and improved brush arrangement and operating device therefor; the provision of a new and improved suction nozzle wherein the direction and quantity of the air stream are so arranged as to afford a maximum of efficiency; while further objects and advantages will appear as the description proceeds.

Generally speaking my invention may be defined as consisting of the combinations and constructions recited in the claims hereto annexed and illustrated, in one embodiment, in the drawings accompanying and forming a part of this application, wherein: Figure 1 represents a view of my improved

cleaner in side elevation, the nozzle and inspection window being illustrated in longitudinal section; Fig. 2 is a top plan view of the device illustrated in Fig. 1; Fig. 3 is a partial view of the machine shown in Fig. 1 with the hose connection attached in place of the inspection window; Fig. 4 is a perspective view of the hose connection removed from the casing; Fig. 5 is a perspective view of a part of my improved machine showing the elevation adjuster; and Fig. 6 is a bottom plan view of said machine showing the elevation adjuster, the brush mechanism, and the nozzle construction.

Describing the parts by reference characters 1 represents the fan chamber consisting of a hollow cylindrical shell having a central axial inlet 2 in one face and having a motor casing 3 secured to its opposite face. Projecting forwardly and downwardly from the forward face of the fan casing is the collecting nozzle 4 having at its lower end a downwardly facing, elongated suction slot 5. Viewed from above said suction nozzle is of generally triangular or fan shape as shown in Fig. 2, being of its greatest breadth at the inlet slot 5, which therefore runs transversely of the machine, and becoming narrower as it progresses rearwardly until it reaches the neck 6 whereby it is joined to the fan casing 1.

Formed on the upper surface of this neck is a circular seat 7 surrounding two distinct passageways 8 and 9 separated by a partition 10. The passageway 8 leads immediately to the fan chamber by way of the opening 2; the passageway 9 communicates with the suction slot 5, the whole interior of the nozzle 4 being preferably hollow and for this purpose.

Upon this seat 7 I place a hollow or hemispherical transparent inspection window 12, which I secure in place in any suitable or convenient manner. In the present embodiment I have shown the edge of said window as received within a pressed metal ring 13, which overlaps the edge and side of the window and is formed with an external bead 14. Over the exterior of said window I have illustrated a protecting covering 15 of screen cloth, having certain portions displaced inwardly as at 16 so as to engage the glass with a yielding steady pressure, and having its peripheral portion firmly secured within the bead 14 in any

suitable manner as by soldering. The window is preferably held in place by means of fingers or clips 17 secured to opposite sides of the neck 6 and overlapping the bead 14, said bead being notched at suitable points as shown at 18 to permit the removal of the window.

In Fig. 5 I have illustrated a modified form of inspection window wherein the bead 4^a is of glass and formed integral with the window, similar notches 18^a being provided. The clips or fingers are preferably resilient so as to grip the window with a steady pressure and prevent rattling, although in operation the air suction will tend to hold the same firmly to its seat regardless of additional safeguards.

For the attachment of an extension hose I provide a flat plate 20 of a size and shape to fit snugly within the seat 7 and having at one side a hose receiving nipple 21 adapted to come into alinement with the passageway 8 when the plate is secured in its seat. The edges of the plate 20 are formed with ribs or beads 22 notched as at 23 and adapted to be held in place by the fingers 17 in the same manner as the inspection window, and the face of the plate is formed to fit snugly against the partition 10, both being flat in the present embodiment. I have illustrated the plate as formed with a projection or finger 25 arranged to engage the fan chamber in case it be attempted to apply this plate wrong side to, and also to serve as a handle in rotating the plate and bringing the nipple 21 to the proper position.

The rearward portion of the machine is supported by means of a suitable roller or caster 30 affixed to the motor shell, while the forward end of the same is supported upon rollers 31—31 secured to the ends of a shaft 32 which is journaled in a movable frame 33 hinged to the fan casing at 34. The shaft 32 and hinge pintle 34 are both horizontal and parallel to the suction slot 5. Rigidly connected to the frame 33 is a lever 35 which projects upwardly past one side of the neck 6 and engages notches 37 in said neck whereby the frame 33 is held in adjusted position. The lever 35 is made slightly flexible or resilient so as to permit it to be sprung from one notch to the next.

The end of the suction nozzle terminates in a pair of spaced parallel jaws 40 and 41 defining an inlet mouth, and between these jaws I have shown a wall 42 spaced from the jaw 40 to form the suction slot 5 and spaced from the jaw 41 to form the brush chamber 43. The wall 42 preferably terminates inside of the plane of the jaws 40 and 41 so as to define a shallow passage above the carpet as illustrated at 44, and in the brush chamber 43 I mount a rotatable brush 45. The ends of this brush are secured in bearings 46 of the usual or any

suitable type, and the center of the same is preferably provided with a belt pulley 47 connected by means of a crossed belt 48 with a belt pulley 49 carried by the shaft 32. The belt 48 is preferably longitudinally elastic such as a coil spring and passes through a small aperture 50 in the rear of the brush chamber 43. This crossing of the belt, in addition to the advantages of giving a more perfect hold upon the wheels and of rotating the brush 45 against the motion of the sweeper, permits the apertures 50 to be made of a minimum size, the diameters of the wheels 47 and 49 and the location of the jaw 41 being so chosen that the two sides of the belt cross at or near the plane of this opening.

The operation of the inspection window, the hose attachment, and the elevation adjuster, will be too obvious to require explanation, although, as to the last of these it will be noted that the shaft 32, when in the mean position of its adjustment lies substantially in the same plane with the brush 45 and hinge 43, so that the vertical adjustment has little or no effect upon the tightness of the belt 48. The operation of the brush is largely the same as in previous machines excepting that its location in a chamber practically independent of the suction effect prevents the dust and lint from being drawn into the brush so as to clog the same, but rather the rush of air beneath the wall 42 tends to remove adherent lint and dust from the bristles and so keep the brush clean. The distance of the wall 42 above the plane of the inlet mouth is such that the carpet will not be brought into contact with it, even when lifted from the floor by the suction, and the brush extends lower than this wall. Also, regardless of the presence of a brush, the large inlet mouth creates a stronger lifting tendency upon the carpet than a narrower nozzle thus raising heavier and stiffer floor coverings, while the employment of the interior wall provides the same strong localized suction that characterizes the narrow nozzle. The air which enters the chamber 43 passes between the top of the carpet and the bottom of the wall 42 in a thin sheet. The inlet mouth is preferably maintained exactly parallel with the floor so that both jaws will bear against the carpet with equal force and tightness. The vertical adjustment at the front rather than at the rear coöperates to this end by giving a longer radius of adjusting movement.

The cleaner is manipulated by means of a suitable handle 55 pivoted to the cleaner casing upon a horizontal transverse axis 56, and the dirt and dust are ejected from the fan casing through a discharge neck 57 into a dust bag 58 which is preferably located above and forward of the handle

so as always to be out of engagement with the floor regardless of whether the machine is being used with its main nozzle or with its extension nozzle. However, in this, as in
5 other points of detail, great changes could be made without departing from the scope of my invention since while I have described with precision the forms, arrangements and constructions which now appear
10 preferable to me, I do not propose to limit myself to such details except as the same may be positively included in the claims or may be rendered necessary by the prior state of the art.

15 Having thus described my invention what I claim is:—

1. In a suction cleaner, a casing having an inlet mouth and a fan chamber, a seating portion located between the inlet mouth
20 and fan chamber, there being a pair of openings through said seating portion and communicating respectively with said inlet mouth and fan chamber, said seating portion being adapted to receive either a cover
25 adapted to place said openings in communication or a plate having a hose connection

communicating with the fan chamber opening, and means for securing either said cover or said plate to said seating portion.

2. In a suction cleaner of the type having
30 an inlet mouth and a suction device, the combination of a seating portion located at a point between the inlet mouth and suction device, there being a pair of openings
35 through said seating portion and communicating respectively with said inlet mouth and suction device, a cover member adapted to fit to said seating portion, a plate having an eccentric hose connection also adapted to fit said seating portion, and means for
40 securing to said seating portion either said cover whereby said openings are placed in communication with each other or said
45 plate with its hose connection communicating with the suction opening.

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

JAMES B. KIRBY.

Witnesses:

HAROLD E. SMITH,
HUGH B. MCGILL.