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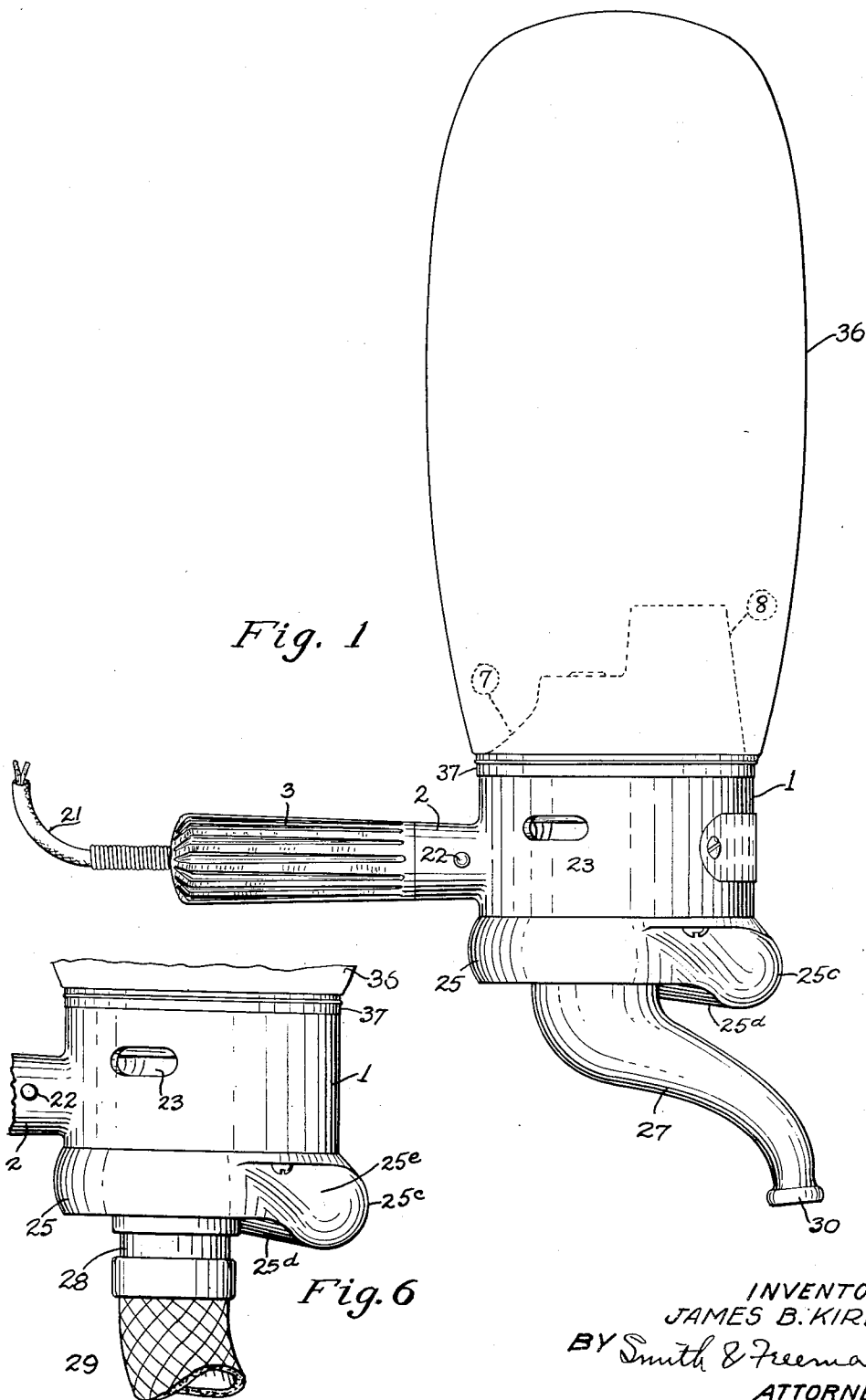
1,698,725

J. B. KIRBY

SUCTION CLEANER

Filed May 12, 1923

2 Sheets-Sheet 1



INVENTOR
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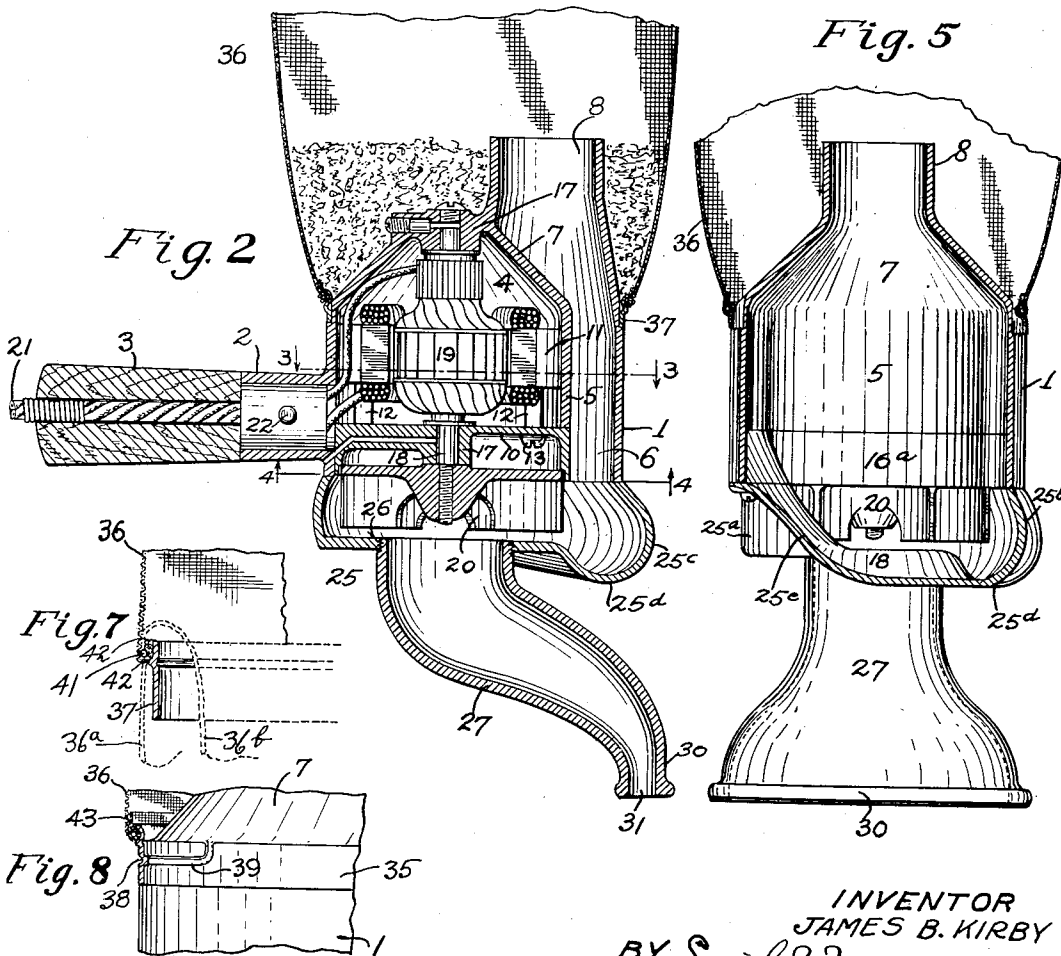
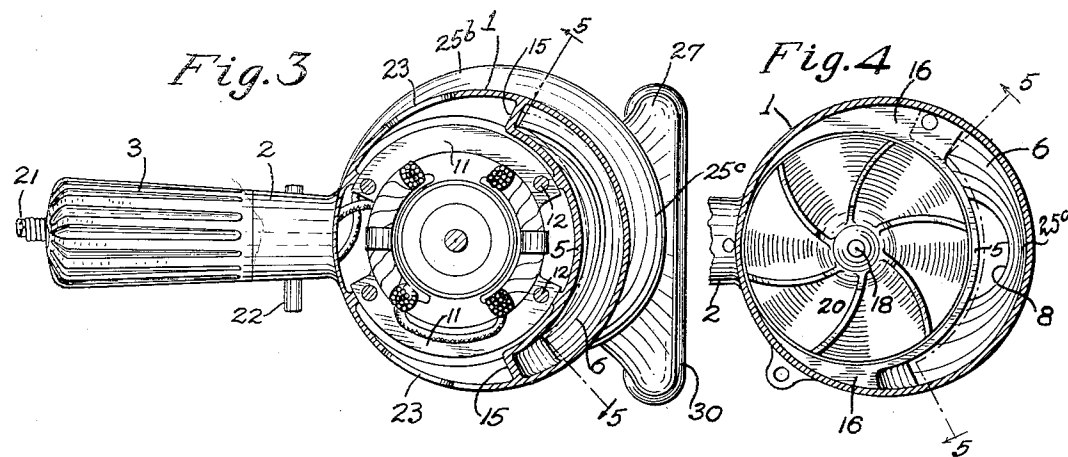
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UNITED STATES PATENT OFFICE.

JAMES B. KIRBY, OF WEST RICHFIELD, OHIO.

SUCTION CLEANER.

Application filed May 12, 1923. Serial No. 633,574.

This invention relates to suction cleaners and has for its objects the provision of a compact and powerful suction cleaner of the electrically operated type and especially one which may be made of very small size and light weight, for use in cleaning furniture, upholstery, store-counters, dry-goods-stocks, automobile interiors, and the like; the provision of an electric vacuum cleaner having a new and improved arrangement and relation of its different parts, whereby weight is reduced, efficiency is increased, manufacture is facilitated and cool running assured; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have shown one physical structure in which my inventive ideas can be embodied although it will be understood that these are merely illustrative and not limiting upon me. Fig. 1 is a side elevation of one of my improved suction cleaners; Fig. 2 is a vertical sectional view through the center of the device shown in Fig. 1; Figs. 3 and 4 are horizontal sectional views corresponding to the lines 3—3 and 4—4 respectively of Fig. 2 and looking in the direction of the arrows; Fig. 5 is a vertical sectional view corresponding to the broken line 5—5 of Figs. 3 and 4 and looking in the direction of the arrows; Fig. 6 is a detail view of a part of the cleaner showing the attachment of an extension hose thereto; Fig. 7 is a detail view showing the method of making the bag; and Fig. 8 is a detail view showing the mode of attaching the bag to the casing.

Describing the parts by reference characters, 1 represents the casing of the machine which is preferably cylindrical in shape and in small sizes is preferably made with a radial socket 2 for the reception of a rigid handle 3. Interiorly this casing is formed with an approximately circular chamber 4 of smaller size than the casing and eccentrically located relatively thereto so that its wall 5 shall on the one side define an arcuate passage-way 6 leading from end to end of the casing inside its periphery. One end of the chamber 4 is defined by a conical wall 7 which preferably projects a distance above the cylindrical wall of the casing 1, while the arcuate passage 6 is gathered together into a cylindrical snout 8 which projects above and slightly overhangs the conical

wall 7. The opposite end of the chamber 4 is transversed by a removable closure 10, and inside the chamber are located the field members 11 of an electric motor having longitudinal studs 12 therein by which they are held together and to which are attached the screws 13 by which the plate 10 is attached. In the present embodiment the wall 5 is formed at each end with an offset merging with the wall 1 and the plate 10 is formed with wings 16—16 conforming generally to the space so produced. Also in the present embodiment the plate 10 is formed with a marginal flange 16^a which constitutes a continuation of the wall 5, although it will be understood that all these minor details are subject to variation.

Mounted in bearings 17—17 carried by the end 7 and plate 10 is the shaft 18 of an armature 19 to whose lower end is attached the fan 20. In the present embodiment the chamber 4 is located adjacent that side of the casing 1 from which projects the socket 2 so that the lead wires 21 can conveniently be brought in through this handle, the socket being also provided with a suitable switch 22. The wall of the casing 1 is also formed with ventilating apertures 23—23 opening into the chamber 4, in addition to which a large amount of heat is abstracted by the air passing over the plate 5.

In its preferred design the fan 20 projects largely beyond the end of the casing 1 and is enclosed in a removable housing 25 which constitutes the fan chamber. One side of this chamber approaches closely to the side of the fan as suggested at 25^a in Fig. 5, and from this point the wall gradually diverges from the fan blades as shown at 25^b in Figs. 3 and 5 until it reaches a maximum displacement at 25^c where it registers with the passage-way 6. I have shown the bottom of the housing 25 as flat throughout the portion which is opposite the fan, but bulging downwardly outside of that portion as shown at 25^d, so as to obtain a gradual sweep upwardly into the passage-way 6 by means of the inclined side 25^e. The lower face of the housing 25 opposite the fan is formed with an inlet opening 26 adapted to receive either the rigid nozzle member 27 or the ferrule 28 of an extension hose 29. This nozzle may be of any suitable or desired shape, and the hose of any convenient fabric or length; although I have shown the nozzle as having a narrow elongated mouth portion 30 dis-

placed out of line with the casing upon the side opposite the handle so as to facilitate the presentation of the inlet mouth 31 to cracks and angles. The plane of this mouth 5 is made substantially perpendicular to the axis of the motor and its casing so that the latter is substantially vertical as shown in Fig. 1 when the collecting nozzle is applied to a horizontal surface in operating relation.

10 At the end of the casing 1 opposite the fan housing 25 I provide a circular seat 35 for the reception of the dust bag. Preferably this bag comprises a hollow fabric receptacle 36 of elongated bulging shape having at its 15 mouth a cylindrical metal ring 37 formed with spaced internal lugs 38 adapted to enter suitable bayonet slots 39 formed in the seat 35. According to my preferred construction the bag is connected to the ring by 20 first sewing the side of the bag for a short distance only and inserting the smooth end of the ring into the mouth of the same while it is turned wrong side out with the seams exposed as shown at 36^a in Fig. 7. The ring 25 37 is formed with a pair of spaced external ribs 42 between which the clamping wire 41 is placed. The peak of the bag has meanwhile been left open to permit its being turned right side out, whereupon it is im- 30 mediately turned inside out again by having the peak drawn through the inside of the ring as shown at 36^b, this being permitted by the comparatively large size of the same. This enables the sewing of the seams to be 35 completed upon the inside of the bag while facilitating the attachment of the ring thereto.

In use the blast of air up the passage 6 and snout 8 distends the bag forcibly and the 40 dust carried thereby settles around the snout and over the top of the wall 7 as shown in Fig. 2. This arrangement traps the litter from falling back through the fan chamber and at the same time leaves the discharge 45 passage wholly unobstructed. The bag requires no separate support, being held tightly distended while the motor is running although it collapses when the motor stops. No dust sleeve or trap is required as the top 50 of the casing effects this, and the litter is removed from the mouth of the bag by which it entered the same.

While I have designed this device primarily for a light weight cleaner to be carried 55 by the operator I do not limit myself either to this size or to this mode of support; neither do I limit myself to any detail of construction except as recited in my several claims.

60 Having thus described my invention, what I claim is:

1. In a suction cleaner, a cylindrical cas-

ing, a hollow snout of smaller diameter than said casing and projecting eccentrically lengthwise beyond said casing, its base be- 65 ing joined to the casing wall, a dust bag having one end embracing said casing and surrounding said snout at a distance from said snout, means for supporting said casing, an electric motor eccentrically mounted in 70 said casing, a collecting nozzle projecting from the end of said casing opposite said bag, a fan adjacent to said collecting nozzle, and an outlet passage leading through said casing past said motor in line with said 75 snout.

2. In a suction cleaner, in combination, a hollow casing, a partition traversing said casing and defining an air passage at one side and a motor chamber at the other side, 80 said motor chamber having a conical end, a snout communicating with said air passage and projecting beyond said conical end, a dust receptacle surrounding said casing so that said conical end constitutes a bottom 85 for said receptacle, a motor in said chamber, a fan at the opposite end of said casing from said snout adapted to force air through said passage, and a suction nozzle communicating with the inlet side of said fan. 90

3. A portable, hand-supported, electric cleaner comprising a cylindrical casing con- 95 taining a motor chamber adjacent one side and an air passage eccentrically located in said casing adjacent the other side, a circular seat at each end embracing both the chamber and passage, a fan housing attached to one seat, a dust bag attached to the other seat, and a nozzle carried by said fan hous- 100 ing, said nozzle having an inlet mouth whose plane is transverse to the casing axis.

4. In a device of the character described, in combination, a casing having a motor chamber therein adjacent to one side, a rigid 105 supporting handle projecting from said wall adjacent to the motor chamber, a fan chamber carried by said casing at one end, a fan therein operatively connected to said motor, a collecting nozzle communicating with said chamber, an exhaust passage leading from 110 the fan chamber and terminating in an exhaust snout projecting in an opposite direction from that in which said nozzle faces, there being a circular seat surrounding a portion of said casing between said snout 115 and nozzle, the diameter of the seat being materially greater than that of the snout, and a dust bag secured to said seat and surrounding said snout, the opposite end of said chamber forming a bottom for the dust 120 receptacle.

In testimony whereof, I hereunto affix my signature.

JAMES B. KIRBY.