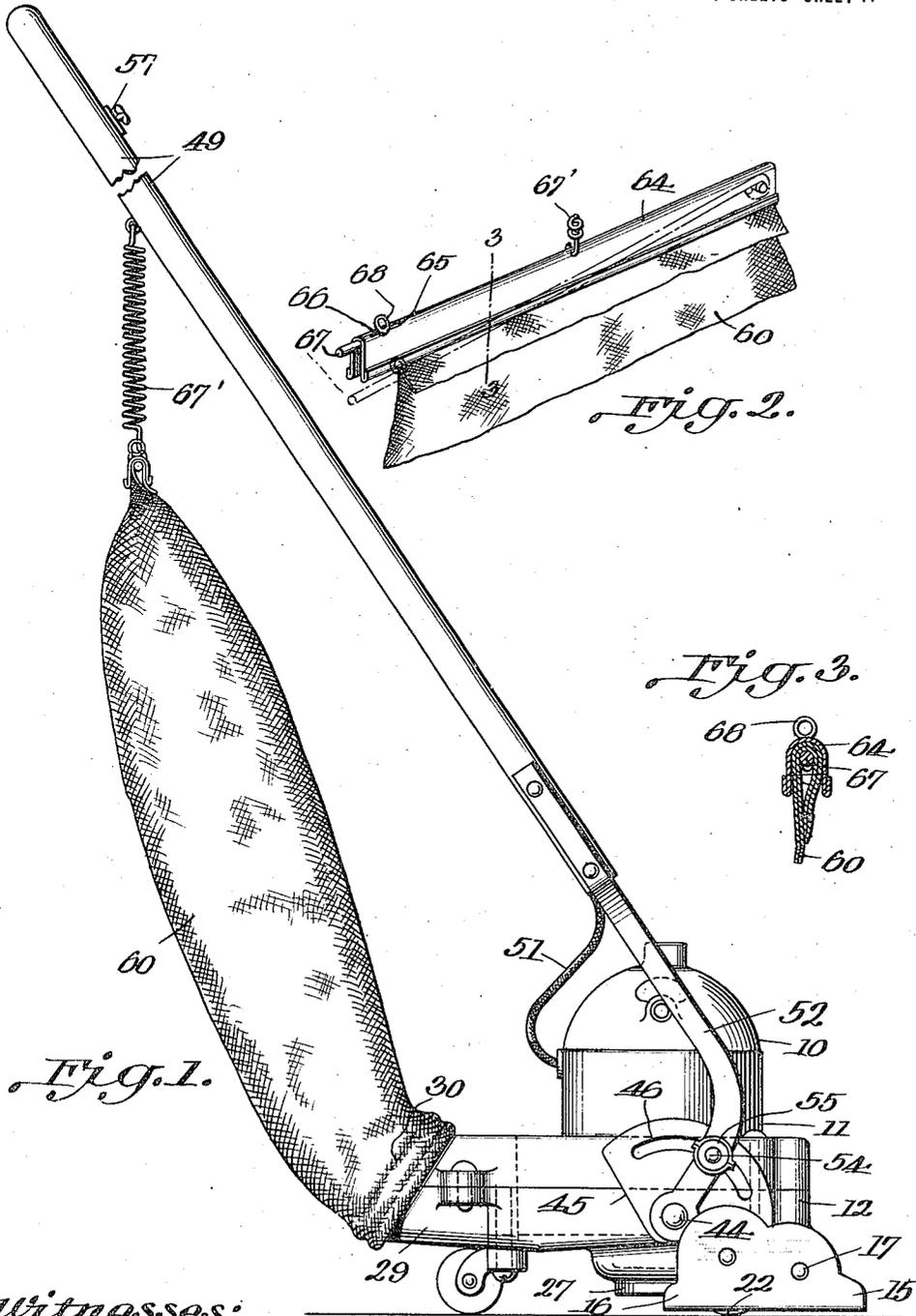


J. B. KIRBY.
 PNEUMATIC CLEANER.
 APPLICATION FILED AUG. 19, 1911.

1,184,459.

Patented May 23, 1916.
 4 SHEETS—SHEET 1.

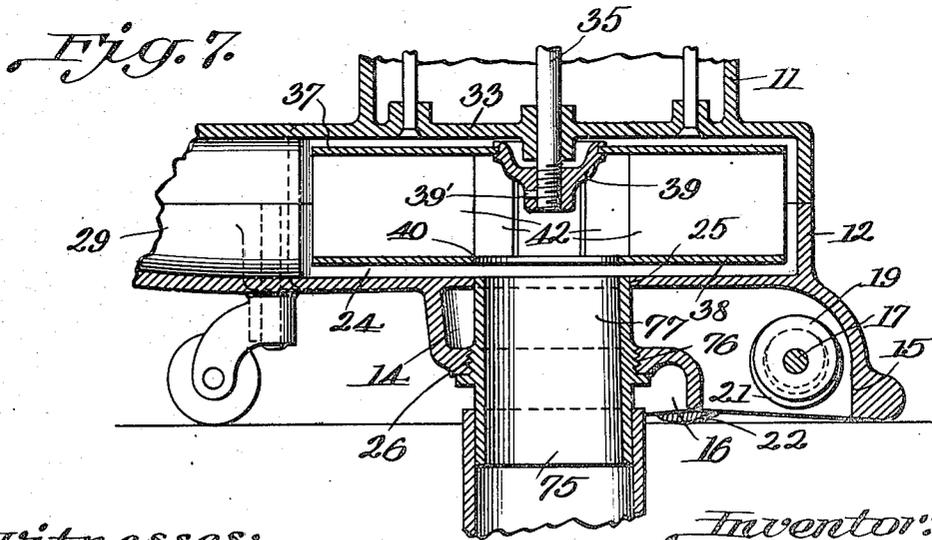
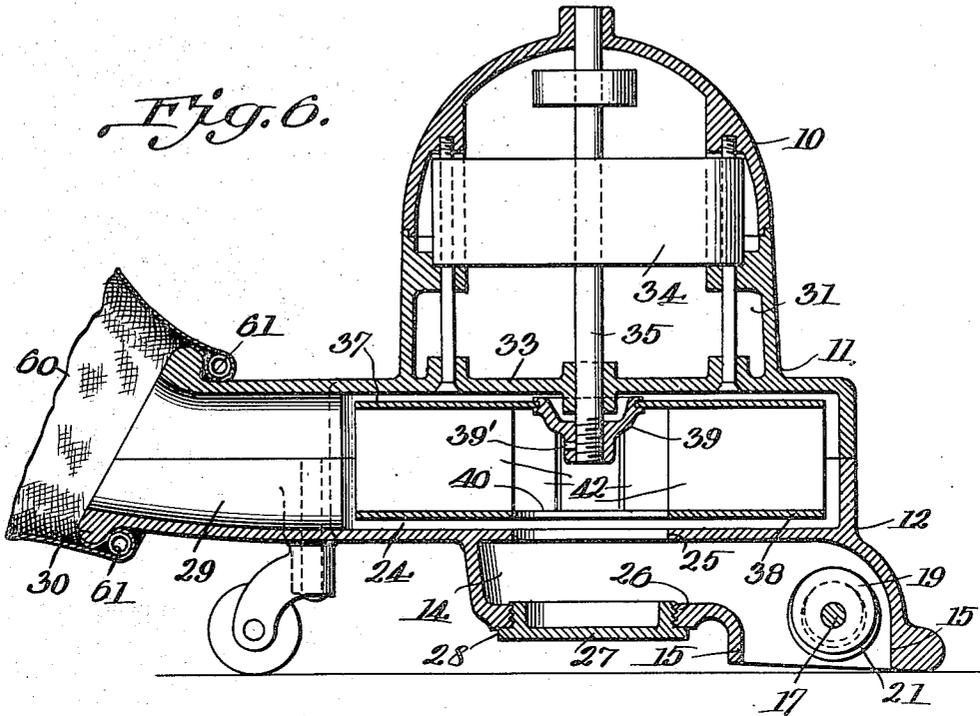


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 4 SHEETS—SHEET 3.



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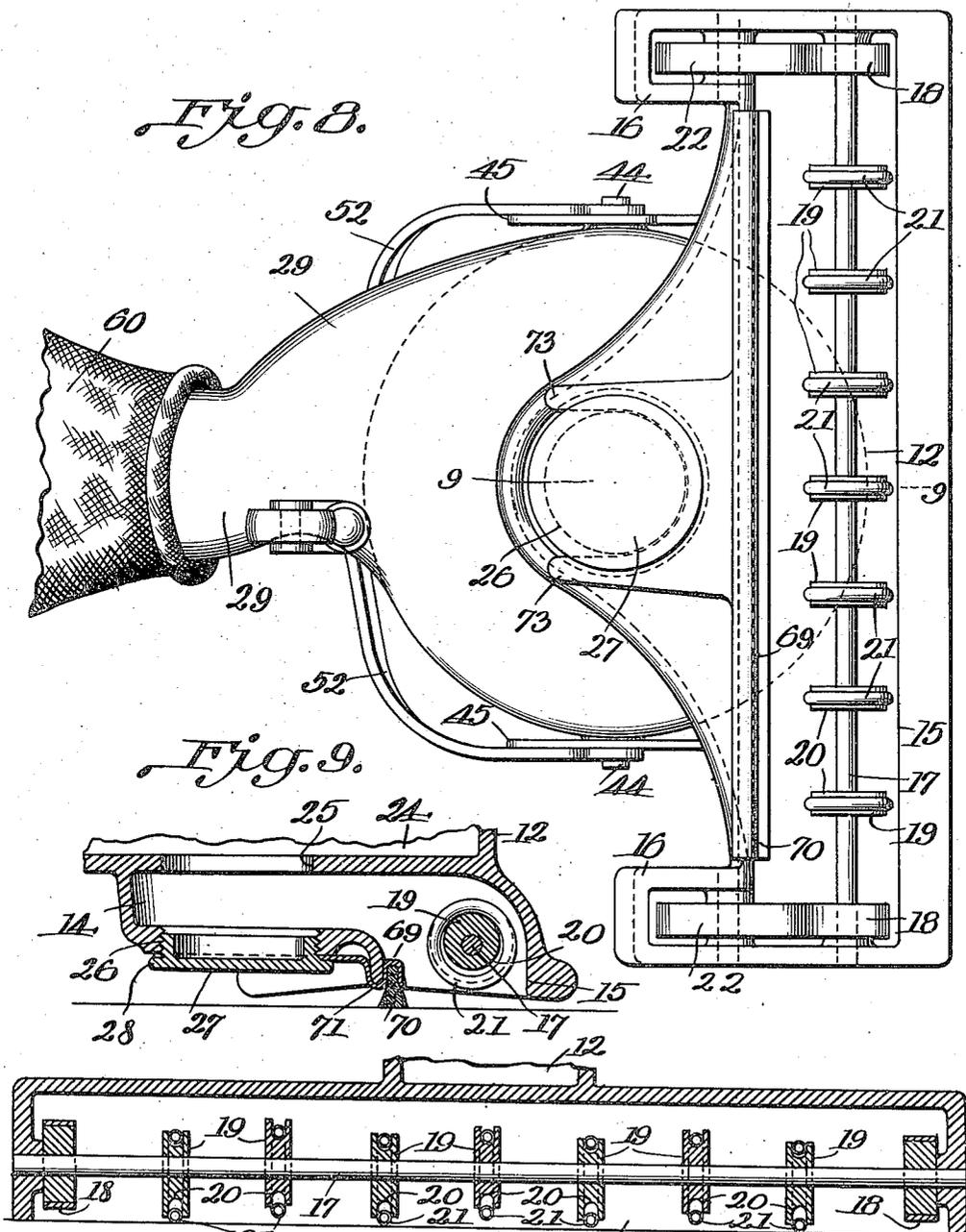
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Fig. 10.

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UNITED STATES PATENT OFFICE.

JAMES B. KIRBY, OF CLEVELAND, OHIO.

PNEUMATIC CLEANER.

1,184,459.

Specification of Letters Patent.

Patented May 23, 1916.

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To all whom it may concern:

Be it known that I, JAMES B. KIRBY, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pneumatic Cleaners; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to new and useful improvements in pneumatic cleaners.

One object of this invention is to provide a pneumatic cleaner which will be simple and compact in construction, easily assembled, and readily taken apart if repairs are necessary.

A further object of my invention is to provide a new and improved connection between the handle and the machine proper by means of which the handle can be pivotally secured to the machine so as to be free to move on its pivots or can be rigidly locked so as to extend outwardly from the machine at any desired angle.

A further object of my invention is to provide in the nozzle of the machine a rotary beating device adapted to come in contact with the surface of the material which is being cleaned.

A still further object of my invention is to provide an attachment for use when operating the machine on hard wood floors which will enable the floors to be thoroughly cleaned.

Another object of my invention is to provide a new and improved coupling device by means of which a hose for carrying auxiliary nozzles can be attached to the machine so as to utilize the full suction power of the machine through the hose.

Another object of my invention is to provide a new and improved clamping device for closing the end of the dust receptacle and new and improved means for supporting the receptacle from the handle and for connecting the dust receptacle with the outlet of the machine.

In the accompanying drawings Figure 1 is a view in elevation of a complete machine embodying my invention. Fig. 2 is an enlarged detail view showing the fastening device at the upper end of the dust-bag. Fig. 3 is a section on line 3—3, Fig. 2. Fig. 4 is an enlarged view in elevation of the ma-

chine proper with the nozzle shown in section. Fig. 5 is a section on line 5—5, Fig. 4. Fig. 6 is a central vertical section. Fig. 7 is a view similar to Fig. 6 but showing the coupling attachment for securing a hose in the clean-out opening. Fig. 8 is a bottom plan view. Fig. 9 is a section on line 9—9, Fig. 8. Fig. 10 is a section on line 10—10, Fig. 4.

Again referring to the drawings it will be seen that my machine proper consists of an outer casing which for convenience is formed in three sections, shown at 10, 11 and 12. At the base of the casing is arranged a suction chamber 14, the wall of which at the rear is rounded and then flares outwardly and forwardly and terminates in a nozzle 15, the mouth of which is slightly inclined from the horizontal, the rear lip of the nozzle lying in a plane above the front lip of the nozzle. The object of this arrangement is to allow the carpet or other fabric over which the machine is being moved to be slightly raised from the floor as the nozzle passes over it thereby permitting a free passage of air from under the carpet up through the carpet and through the nozzle, which of course is not the case when both lips of the nozzle rest equally on the carpet while passing over it. At each end of the nozzle is formed a small housing 16. A shaft 17 extends longitudinally of the nozzle and the ends thereof are journaled in the end walls of the nozzle and at each end of said shaft is rigidly secured a friction driving wheel 18. A plurality of eccentrics 19 are suitably spaced along the said shaft 17 and each eccentric is provided around its perimeter with a deep groove 20, and in each groove in each eccentric is arranged a ring 21 which fits loosely therein. In each of the housings 16 is mounted a small traction wheel 22 which frictionally engages with the adjacent friction wheel 18 and therefore when the device is moved over the surface which is to be cleaned the rotation of the traction wheels 22 will drive the friction wheels 18 causing the shaft 17 to revolve which will carry around the eccentrics 19 and as each eccentric reaches its lowest point it will throw the ring 21 thereon into contact with the surface which is being cleaned, thereby beating the surface and loosening the dust and dirt thereon. The traction wheels 22—22 contact with the floor at each side of the ma-

chine and at the rear of the inlet mouth, thus keeping the carpet or other floor covering down against the floor and preventing it raising so as to make sealing contact with the rearward lip which is slightly elevated; this permits a free inlet of air which picks up the dust particles set free by the beaters and sweeps them upward. Immediately above the suction chamber 14 is arranged a circular fan chamber 24 which communicates with the suction chamber through a circular opening 25 in the dividing wall; and in the bottom of the suction chamber 14 in line with said circular opening 25 is formed a screw-threaded clean-out opening 26 which gives access to the interior of the fan chamber 24. The opening 26 is closed by a screw-threaded cap 27, the said cap having a flange 28 which overlaps the outer surface of the suction chamber. The fan chamber 24 is provided with a tangentially arranged neck portion 29 which forms the outlet for the fan chamber and at the end of said neck portion is formed an annular flange 30. The motor chamber 31 is arranged directly above the fan chamber and is entirely separated therefrom by a dividing wall 33. Within the motor chamber is arranged a motor 34, preferably an electric motor, which has a vertical shaft 35, the upper end of which is supported in a bearing at the top of the motor chamber and the lower end of said shaft extends down through the dividing wall into the fan chamber 24. On the lower end of the shaft 35, within the fan chamber 24 is mounted a suction device or fan which consists of two horizontally arranged plates 37 and 38 which are spaced a distance apart. At the center of the upper plate is secured an interiorly screw-threaded nut or boss 39 which receives the screw-threaded end of the motor shaft 35 and a locking screw 39' extends through the side of the nut and engages a flat spot on the end of the said shaft, thereby preventing accidental loosening of the nut. In the lower plate 38 is formed an opening 40 which is approximately the same size as the opening in the bottom of the fan chamber. Between the said plates 37 and 38 are arranged vertically disposed radial blades 42 which extend from the edge of the opening in the bottom plate 38 outwardly to the perimeter of said plates.

On the outer surface of and at each side of the casing is mounted a sector-shaped member or plate 45 which is rigidly secured thereto. In said plate 45 is formed a curved slot 46 and below said slot at each side of the casing is formed a pivot stud 44 which extends through the said plate and forms a pivot for the handle which consists of a rod or pole 49 grooved longitudinally, as at 50, to receive the electric wire 51. At its lower end the said handle is provided with

the usual forked members 52, one of which extends at each side of the casing and is provided with an opening at its lower end to receive the pivot stud 44. On each of the forked members is mounted a screw-threaded stud 54, one end of which extends through the curved slot 46 in the adjacent plate 45 and the other end is adapted to receive a thumb nut 55. It will be readily seen that by screwing up the thumb nut 55 the forked members can be rigidly secured to the said side plates on the casing and thereby hold the handle rigid at the desired angle or the nut 55 can be left loose and the handle will be free to swing up and down on the pivots if preferred. Near the upper end of the handle is mounted a switch 57 of the usual construction.

The receptacle for receiving the dust consists of a bag 60 of any suitable material which is preferably funnel shaped at its lower end and at its lower end is provided with a ring 61 formed of a coil spring which is adapted to be sprung over the flange 30 on the neck of the outlet, thereby making a very tight connection but one which can be readily detached. At the opposite end of the bag 60 is provided a clamping device which comprises a channel bar 64, at one end of which is formed a longitudinally extending slot 65 and a transversely extending slot 66. At the other end of the channel bar is pivotally secured a rod 67 which is of the same length as the channel bar and at its free end carries a screw-eye 68, the head of which is adapted to pass through the longitudinally arranged slot 65 in the end of the channel bar and then by turning the screw-eye so that its head is seated in the transversely extending slot 66 the rod 67 is clamped securely in the channel bar. When using the clamp the end of the bag is first folded over the rod and the rod is then swung up into the channel bar and locked therein as described. In order to hold the bag tightly in position a coil spring 67' is provided one end of which is secured to the said bag clamping device and the other is secured to the handle of the machine.

When the device is used to clean hard surfaces a special attachment is provided which is adapted to fit over the rear lip of the nozzle. This device consists of a metal plate 69 (shown in Figs. 8 and 9) which is slightly shorter in length than the lip of the nozzle. At the front edge of the said plate is secured a strip 70 of felt or similar material and back of said strip is formed a groove 71 adapted to receive the lip of the nozzle. Prongs 73 extend rearwardly from the said plate and are adapted to be received under the flange 28 of the cap 27 in the bottom of the casing so that said plate will be securely clamped in position. Also in order to connect a hose to the machine to which

auxiliary nozzles may be fastened for cleaning upholstery, curtains and the like, I provide a special coupling which consists of a member 75, which is adapted to be inserted in the end of the hose. The said member 75 is provided with a screw-thread 76 which screws into the screw-threaded opening in the bottom of the casing and beyond said screw-thread is formed a tubular extension 77 which passes entirely through the suction chamber and enters the opening in the bottom of the fan chamber and fits snugly therein. It will therefore be seen that when this coupling is used the suction chamber is entirely cut off from the fan chamber and the full suction from the fan acts directly through the hose.

What I claim is,—

1. A vacuum cleaner consisting of a casing provided with a pump chamber and a suction chamber and separated therefrom by a dividing wall provided with an opening, the walls of the suction chamber terminating in a suction nozzle and the suction chamber provided with an opening registering with the opening in the dividing wall and adapted to receive a cap for closing it or a hose tube extending into the inner opening.

2. A vacuum cleaner comprising a pump chamber, a suction chamber, having an outlet opening to the pump chamber, a suction nozzle and an inlet opening, and a removable closure therefor, said openings adapted to receive a connecting inlet tube.

3. In a pneumatic cleaner, a casing having a fan chamber, a suction chamber arranged directly below said fan chamber and separated therefrom by a dividing wall provided with an opening, said suction chamber being provided with an opening in the bottom thereof in line with the opening in the dividing wall, and a coupling member adapted to be secured in the opening in the bottom of the suction chamber and having a tubular extension which extends across said suction chamber and into the opening in the dividing wall between said suction chamber and the fan chamber.

4. A suction cleaner having a fan chamber and a second chamber adjacent to said fan chamber and separated therefrom by a dividing wall provided with an opening,

said second chamber being provided with an opening in the wall thereof opposite the opening in the dividing wall, a coupling member adapted to be secured in the opening in the second chamber and having a tubular extension adapted to extend across said second chamber in operative relation to the opening in said dividing wall, and a cover adapted to close the opening in said second chamber when said coupling member is removed.

5. In a pneumatic cleaner, a casing having a pump chamber and a second chamber adjacent thereto and terminating in a cleaning device, there being an aperture dividing wall between said chambers and the outer wall of said second chamber having a supplemental opening adapted to receive either a cap for closing it or a coupling communicating immediately with the aperture in the dividing wall.

6. A suction cleaner having a pump chamber and a second chamber separated therefrom by a dividing wall provided with an opening whereby the second chamber may communicate with the first mentioned chamber, the second chamber having an inlet mouth and an opening in operative relation to the opening in the dividing wall, and a coupling member adapted to be applied to the last mentioned opening and having an extension adapted to cut off communication between said first mentioned opening and said inlet mouth.

7. In a cleaner, a casing having a fan chamber and a suction chamber adjacent thereto and separated therefrom by a dividing wall provided with an opening, said suction chamber communicating with an operating mouth and the wall of said suction chamber having a removable portion, and a hose connection adapted to be secured in direct communicating relation to said opening when said removable portion is displaced.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

JAMES B. KIRBY.

Witnesses:

VICTOR C. LYNCH,
N. L. McDONNELL.