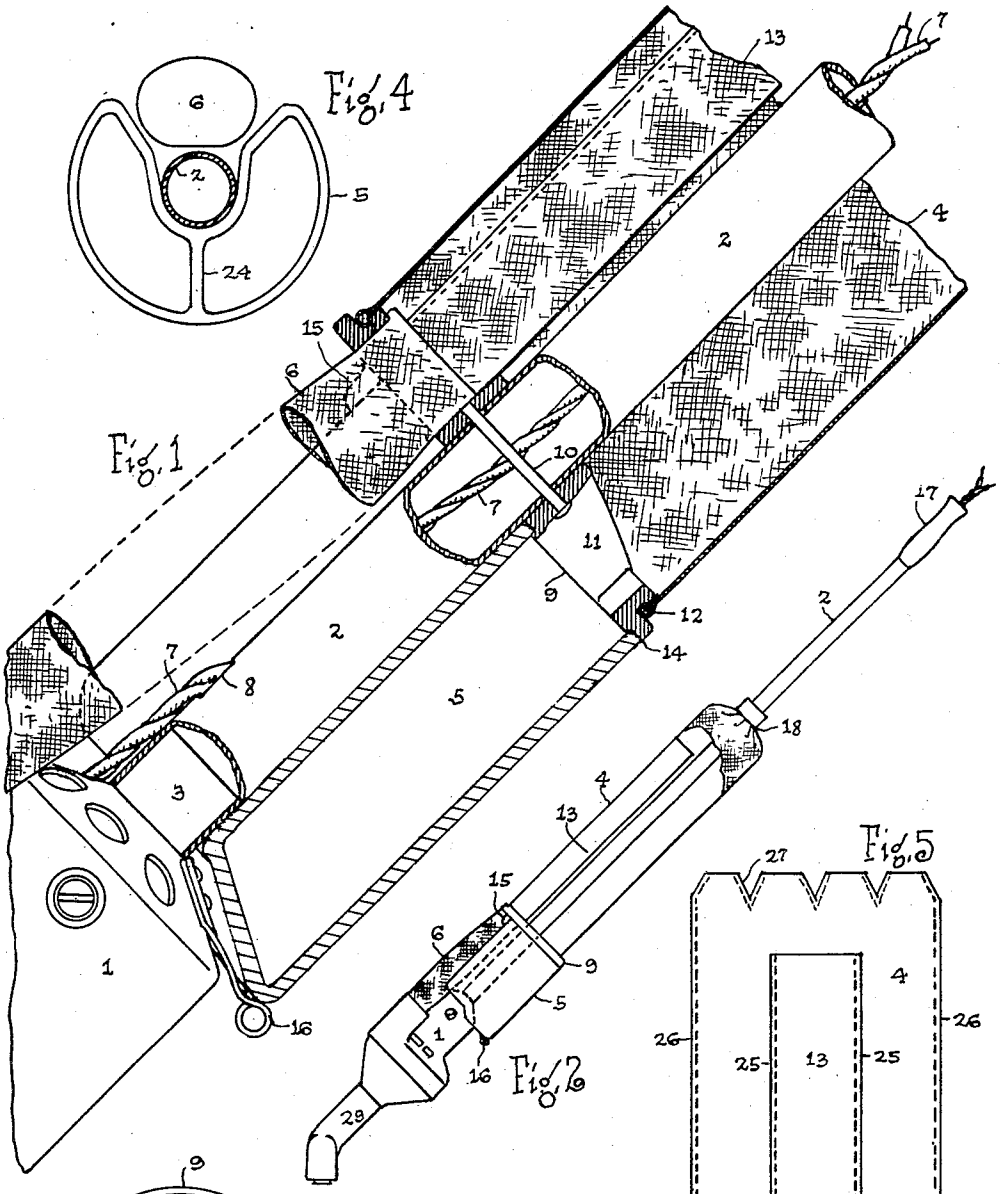
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FILTER AND DIRT DISPOSAL FOR ELECTRIC PUSH BROOMS

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FILTER AND DIRT DISPOSAL FOR ELECTRIC PUSH BROOMS

REISSUED

Application filed September 18, 1931. Serial No. 563,508.

The object of my invention is to produce a simple type of filter and dirt disposal mechanism for an electric push broom.

Vacuum cleaners are bulky devices mostly with articulated handles and all have a combination filter and dirt-collector called a bag.

In order to produce an extremely lightweight, high-speed, electric suction cleaner for all-surface-cleaning, it is desirable that the electric broom be invented and developed in the lightest form, of the greatest simplicity, and of the greatest speed in use. It must further be thoroughly practical on smooth floors and at the same time serve a satisfactory surface cleaning use on rugs and carpets. The electric broom as outlined in my several patent applications admirably serves these purposes.

In order to set forth my invention in terms that all those familiar with these arts may understand, I have prepared the following specification to which I have appended a drawing of which—

Figure I is a partial longitudinal cross-section of filter tube, filter and dirt receptacle.

Figure II is a partially cross-sectioned diagrammatic view of an electric broom.

Figure III is a plan view of the filter-and-receptacle spider.

Figure IV is a diagrammatic transverse section showing the receptacle top in plan view.

Figure V is a diagram of the fabric used for the filter.

In Figure I, 1 is a motor housing in which the axis of the rotor is concentric with the tubular handle 2 which is joined to a boss 3 on the top of said motor housing. The motor housing 1 may represent the entire motor-blower-unit while the upper motor bearing may be within the boss 3. I have discovered that joining the handle to the motor housing in this manner furnishes the most satisfactory, simple structural relationship for obtaining a rigid push-broom type of device. In order to obtain such relationship, it is most practical to place the filter 4 around the handle. It may be concentric, or otherwise if desired. It is also highly desirable to keep the entire push-broom structure as slender, as free from bulk, and as nearly cylindrical as possible. In order to accomplish these results, it is highly desirable to place the dirt receptacle 5 in such manner that it partially surrounds the handle 2. It cannot completely surround it for two reasons, first, the receptacle must be manually removable, and second, the dirt-laden-air must be lead upward from the motor-blower outlet to the filter 4. This is accomplished by means of a fabric tube 6.

The air duct 6 may be made of filter material as shown or may be of sheet metal if desired. Fabric seems the most practical since when the broom is used forcibly against chairs or other obstructions, sheet metal deforms from impact. The handle 2 may be fastened to the boss 3 in any desired manner. The electric leads 7 from the motor may be lead into a slot 8 and the leads themselves brought out of the end of the handle if desired, or brought out in any other manner. A switch also may be provided where desired. A die-cast spider 9 is riveted to the handle 2 at 10. Wings 11 in said spider may be located where desired (see Figures III and IV), and the spider may be of any other suitable material, if desired. The tube 6 may be attached to the spider 9 in any suitable manner. The filter 4 is a cylindrical piece of fabric joined to the spider in the following manner. A wire 12 may be sewn in or inserted in a sewn hem at the base of the filter. The wire is drawn tightly into an annular groove in the spider. The ends of the wire may be joined as desired by twist or solder and the ends disposed of in a neat manner, that is, by sliding the fabric over them or by turning twisted ends into a hole in the spider designed therefor. 4 may be joined to 9 in any other desired manner. The filter 4 has within it a duct 13, formed by the simple method of sewing an extra piece of fabric to the filter 4 itself. It is shown here in true cross-section. The bottom end of the piece 13 is arranged to engage the tube 6 in any desired manner. The dirt receptacle 5 may be made of cast metal, sheet metal, or molded material, such as phenol resin. It is preferably cylindrical on its outer surface and concentric with the

handle. Its upper edge engages a recessed seat 14 in the spider 9. Its back edges come against stops 15 provided on the spider 9 and indicated in dotted lines. The receptacle 5 may be held in place by any desired means such as springs attached to the sides of the spider 9 or by the spring 16 on the top of the motor housing. As shown, the receptacle may be removed by pulling out at the bottom. It may be simply pushed in place since it is perfectly aligned by the handle 2, stops 15, and the spring 16.

Figure II is a side elevation of an electric push-broom (or quick use, light-duty vacuum cleaner if preferred). The motor-blower-unit 1 is provided with a brush or broom nozzle 29 which may be rigid or flexible as desired. The duct 6 leads into the duct 13 carrying the dirt-laden-air over the top thereof. Since approximately four-fifths of the filtration takes place in the main filter after the air has passed from the duct 13, the speed of air at the top of the duct 13 may be said to be four-fifths of its speed as it leaves the motor-blower. This is more than sufficient to carry all the dirt over the top of the duct 13, since the air speed is greater at that point than at any point in the inlet to the nozzle 29. The movement of air with the aid of gravity carries the dirt into the receptacle 5. The handle 2 may be provided with a further handle 17 of wood, metal, or molded material. The filter 4 is gathered together in folds or gores to an attachment to the handle 2 at 18 where it may be covered with a ferrule for neatness.

Figure III shows a plan view of a suitable spider 9 taken from the top. An opening 19 is provided for the attachment of the tube 6. Openings 20 provide means whereby the dirt is deposited in the container 5. A leg 21 in the spider may be provided on the underside of the broom in order to provide greater strength to a light part in case the broom is dropped and this point strikes the floor. The stops 15 are shown on the underside in dotted line while the annular filter groove is shown at 22. 23 is the opening for the handle.

In Figure IV the top side of the container 5 is shown in diagram. If this receptacle is made of molded material, a dividing wall 24 adds great resistance to breakage and since it is in alignment with the spider leg 21, it adds no impediment to the falling dirt. It should be noted that while 5 is annular, it is also removable from the handle 2 and the space cut out to permit such removal is utilized for the air duct 6.

Figure V shows diagrammatically a pattern for the filter 4. The attachment piece of fabric 13 is sewn along two sides 25. The outer sides 26 of the filter 4 are sewn together with 13 on the outside. The gores as at 27 are sewn in and the filter turned providing a neat and practical filter with an integral inlet duct. A hem is sewn along the bottom edge 28 through which the wire for attachment may be passed.

Having set forth my invention in the clearest terms, I wish it understood that many departures may be made from the detailed constructions herewith shown without departing from the spirit of my invention.

I claim:—

1. In a suction cleaner, an exposed motor-blower-unit, a handle rigidly attached thereto, a spider surrounding said handle, a filter joined to the upper side of said spider, and a manually removable dirt receptacle operably joined to the lower side of said spider located between said spider and the motor-blower-unit.

2. In a suction cleaner, an exposed motor-blower-unit, a handle rigidly attached thereto, a spider surrounding said handle, a filter joined to the upper side of said spider, a manually removable dirt receptacle operably joined to the lower side of said spider located between said spider and the motor-blower-unit and partially surrounding said handle.

3. In a suction cleaner, an exposed motor-blower-unit, a handle rigidly attached thereto, a spider substantially concentric with and rigidly attached to said handle, a fabric filter surrounding and substantially concentric with said handle and joined to the upper side of said spider, and a manually removable dirt receptacle located between said spider and the motor-blower-unit substantially concentric with and partially surrounding said handle.

4. In a suction cleaner, an exposed motor-blower-unit, a handle rigidly attached thereto in such manner that the motor axis and handle axis are substantially coincidental, a spider supported on said handle and concentric therewith, a filter joined to the upper side of said spider, a dirt receptacle partially surrounding said handle operably joined to the underside of said spider located between it and the motor-blower-unit, and an air duct disposed on the unsurrounded portion of said handle adjacent to said receptacle.

5. In a suction cleaner, a motor-blower-unit, a handle rigidly attached thereto, a spider surrounding said handle, a filter joined to the upper side of said spider, a manually removable dirt receptacle operably joined to the lower side of said spider, a duct connection from the blower through the spider to the filter, and a duct leading therefrom within the filter delivering into the upper end thereof, both of said ducts having substantially the same diameter.

6. In a suction cleaner, a motor-blower-unit, a handle rigidly attached thereto, a spider surrounding said handle, a filter joined to the upper side of said spider, a manually removable dirt receptacle operably joined to the lower side of said spider, the handle being tubular and said motor-blower-unit having

its electrical cord passing down through said tubular handle and thence passing out of the handle adjacent said unit for connection with the motor thereof.

7. In a suction cleaner, an exposed motor-blower-unit, a handle rigidly attached thereto in such manner that the motor axis and the handle axis are substantially coincidental, a substantially annular spider attached to said handle, a filter supported at the upper side of said spider, a dirt receptacle partially surrounding said handle between the underside of the spider and the blower, duct-connections respectively between the motor-blower-unit and the filter, and between the filter and the dirt receptacle, the spider being suitably formed with openings through which said duct connections are made.

Signed at New York, in the county of New York and State of New York this sixteenth day of September A. D. 1931.

WARD LEATHERS.