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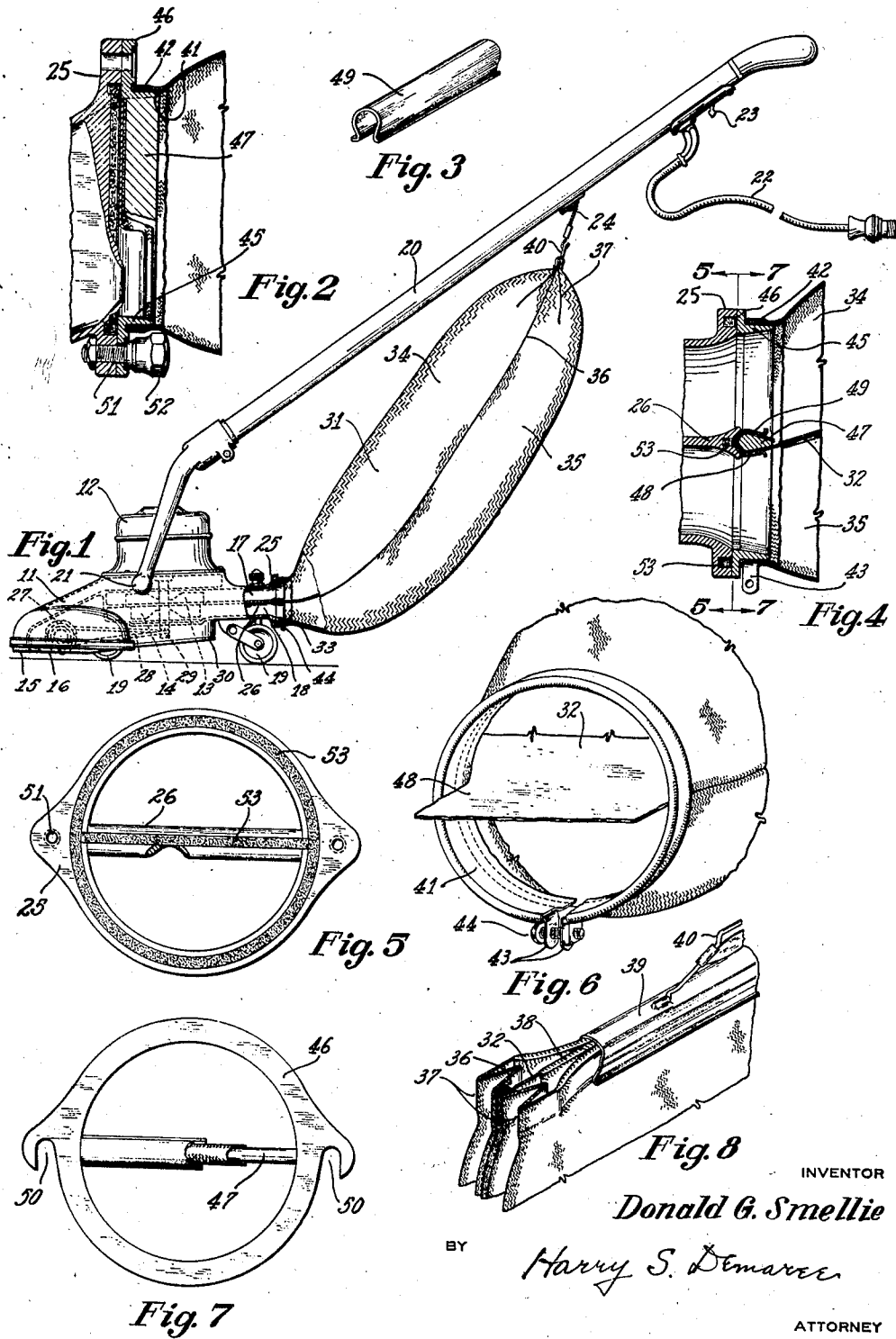
D. G. SMELLIE

2,014,118

SUCTION CLEANER

Filed Nov. 27, 1933

2 Sheets-Sheet 1



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SUCTION CLEANER

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2 Sheets-Sheet 2

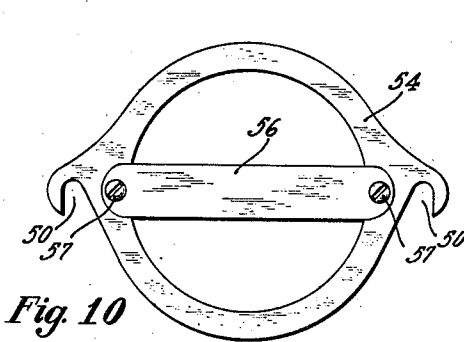


Fig. 10

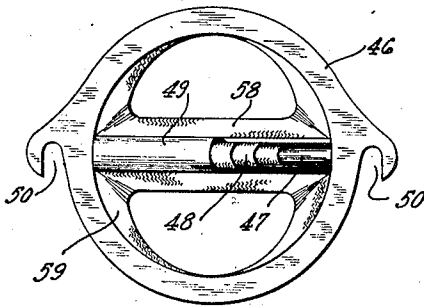


Fig. 12

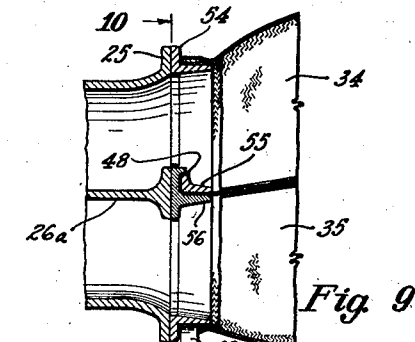


Fig. 9

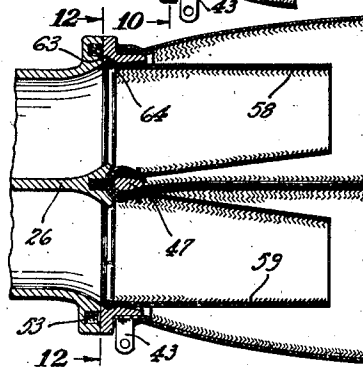


Fig. 11

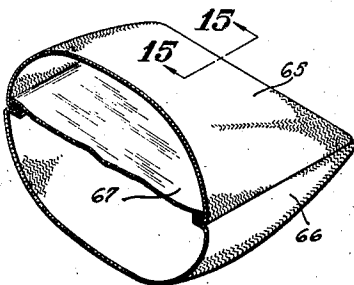


Fig. 14

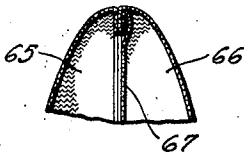


Fig. 15

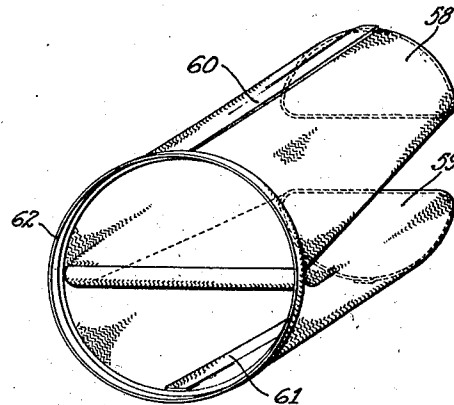


Fig. 13

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2,014,118

SUCTION CLEANER

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8 Claims. (Cl. 183—51)

This invention relates to suction cleaners, and particularly to suction cleaner dust bags, for filtering the dust and litter from the air which passes through the cleaner and retaining such dust and litter until it may be convenient to empty it from the bag.

It has been proposed heretofore to provide a suction cleaner with two fans, usually connected to separate nozzles, the fans and nozzles being so designed as to effect a relatively higher suction in one nozzle than in the other, or so designed and combined with other features that suction may be effected in both, or a selected one of the nozzles. One of the objects of the invention is to provide a dust bag suitable for use with a suction cleaner which has two fans, each having a separate outlet, so that either fan may be used without danger of air being forced backward in the other fan outlet. Further objects are to provide a bag which can be economically manufactured, which will present a neat appearance, which will be durable, and which can be conveniently emptied. A still further object is to provide a bag of this type which can be conveniently attached to the cleaner, and other objects of invention and novel features will be apparent from the following specification, when read with reference to the accompanying drawings, in which:—

Fig. 1 is a view in side elevation, partly broken away, of a suction cleaner and bag embodying the invention;

Fig. 2 is an enlarged fragmentary view in horizontal section, with parts broken away, of part of the structure shown in Fig. 1, illustrating the connection between the dust bag and the cleaner outlet;

Fig. 3 is a view in perspective of one of the parts shown in Figs. 1 and 2;

Fig. 4 is a fragmentary view in vertical section of the parts shown in Fig. 2;

Fig. 5 is a view in elevation of the cleaner outlet, taken on the line 5—5 of Fig. 4;

Fig. 6 is a view in perspective of the inlet end of the bag shown in Fig. 4, with the part shown in Fig. 5 removed;

Fig. 7 is a view in elevation of the inlet end of the bag, taken on line 7—7 of Fig. 4, certain parts being broken away;

Fig. 8 is a fragmentary view in perspective of the upper end of the bag shown in Fig. 1;

Fig. 9 is a fragmentary view in vertical section, similar to Fig. 4, but showing a modified form of attaching means;

Fig. 10 is a view in elevation of the inlet end of the bag, taken on line 10—10 of Fig. 9;

Fig. 11 is a fragmentary view in vertical section, similar to Fig. 4, but showing still another modified form of bag structure;

Fig. 12 is a view in elevation of the bag inlet, taken on line 12—12 of Fig. 11, certain of the parts being broken away;

Fig. 13 is a detail view in perspective of one of the parts shown in Figs. 11 and 12;

Fig. 14 is a fragmentary view in perspective of the upper end, of still another modified form of bag; and

Fig. 15 is a fragmentary view in vertical, longitudinal section taken on line 15—15 of Fig. 14.

In the drawings there is illustrated, in Fig. 1, a suction-cleaner comprising a body 11, having an electric motor 12 thereon which operates fans 13 and 14, such fans being located in separate fan chambers which are parts of separate conduits 20 leading from nozzles 15 and 16 to separate outlets 17 and 18. The suction cleaner as a whole is mounted on wheels 19, and provided with a handle 20, pivoted to the suction cleaner body 11 at 21, by which it may be readily moved about and guided over the floor covering, it being understood that the nozzles 15 and 16 are supported slightly above the normal level of the floor covering, and that the motor 12 is supplied with current through a cable 22 which preferably enters the handle 20 near its upper end, a suitable switch 23 being provided to control operation of the motor. The handle is also preferably provided with suitable yieldable means 24 for supporting the upper end of the bag, and the outlets 17 and 18 are each preferably semi-circular in cross section and formed together in a circular rearward outlet extension which terminates in a substantially vertical plane and is provided with a peripheral flange 25 and a horizontal partition 26, which constitutes the common wall between the conduits 17 and 18. In the structure shown, a rotary agitator 27 is mounted in the rear nozzle 16, which is wider than the forward nozzle 15, the agitator being driven by a belt 28 from a pulley 29 on the motor shaft, and a removable cover plate 30 is provided to permit access to the belt and pulley. As stated above, all of such structure has been proposed heretofore and the present invention relates to dust bags for use as a part of a suction cleaner of such, or similar, construction.

It will be apparent that, in a machine such as that illustrated, the amount of air handled by the fans will be different, and it is desirable that the

suction in the nozzle 15 be materially higher than that in the agitator nozzle 16 and that, if the outlets of the fans were connected to the same dust bag they would have to operate against the same back pressure from the bag and it would be more difficult to obtain a high suction in the nozzle 15 than if the fan connected to such nozzle discharged to a dust bag of its own. It will likewise be apparent that if, in a double nozzle machine of this type, provision were made for using only one of the nozzles, when desired, as by closing the other nozzle, removing the lower fan 14, or by some other expedient, and the outlets were connected to the same common bag, the back pressure from the bag would force the air backward into the outlet from the other nozzle.

In order to obviate these difficulties, the bag 31 shown herein, in accordance with the invention, is formed of filtering material and provided with a diaphragm or partition 32 of impermeable material, preferably extending from end to end of the bag, such partition being arranged horizontally to register with the partition 26 between the fan outlets, and dividing the bag into separate compartments.

As shown in Figs. 1 to 8, the bag 31 is of a usual shape, having a narrowed inlet end 33, and formed of an upper portion 34 and a lower portion 35, the edges of such bag portions being sewed together, and the edges of the diaphragm or partition 32 being secured thereto, by internal seams 36. The width of the diaphragm 32 is considerably less than the width of the upper and lower portions 34 and 35, being no wider than is the inflated bag, so that it is taut and substantially flat when the bag is inflated. At its upper end the bag 31 is provided with folds 37, as shown in Fig. 8, and the diaphragm 32 is preferably thickened, as shown at 38 in Fig. 8, between the inner edges of such folds, so as to present a substantially uniform thickness of the folded parts, and prevent leakage when a supporting clip 39, of channeled, spring material, is slid laterally upon the end of the bag. The clip 39 acts both as a closure for the open upper end of the bag and as a support therefor, a bail 40 being pivotally carried by the clip and detachably connected to the supporting means 24 on the handle. The diaphragm 32 is preferably inextensible, and it will be apparent that, when the bag is packed, for shipment or storage, the folds will extend the entire length of the bag, but that when the bag is inflated such folds will appear only adjacent the supporting clip 39.

The inlet end of the bag is formed with an inverted hem 41 in which there is secured a split clamping band 42, having ends 43 projecting outwardly through the bag material for engagement by a bolt 44 by which the band may be contracted to clamp the mouth of the bag to the flange 45 of a bag ring 46. The bag ring 46 is formed with a diametrically extending bar 47, preferably rounded toward the front, and the diaphragm 32 has a tongue 48 extending through the bag mouth, and the full width thereof, for attachment to the cross bar 47 of the bag ring by a channeled clip 49 of spring material which is sprung into clamping relation thereon, as shown in Figs. 2, 4 and 7. The bag ring 46 is shaped to fit tightly against the peripheral flange 25 of the cleaner outlet extension, and has laterally extending lugs thereon provided with slots 50 to receive threaded studs 51 which extend rearwardly from the flange 25 and carry nuts 52 for clamping the bag ring to the flange 25. The flange 25 is preferably formed with an

annular channel in its rear face to receive a gasket 53 of sponge rubber or other suitable material, and the partition 26 is preferably widened at its rear edge and formed with a similar channel to receive a similar gasket 53, the widened rear edge of the partition 26 being also preferably channeled to fit the rounded face of the clip 49.

In the structure shown in Figs. 9 and 10, the bag ring 54 is formed with a cross bar 55, and a diametrically extending clamping bar 56 of T-shape in cross section is secured to the bag ring by screws 57, the tongue 48 being clamped between them, and the clamping bar 56 is countersunk into the face of the bag ring, so as to present a flat surface for contact with the flange of the cleaner outlet and the partition 26a thereof.

The modified structure illustrated in Figs. 11 to 13 is substantially identical with that shown in Figs. 1 to 8, except for the addition of dual inlet valves extending into the inlet ends of the bag compartments. The tubular inlet valves 58 and 59 preferably taper slightly rearwardly, and are preferably made from a single piece of comparatively flexible cloth, or similar material, the central portion being adapted to be engaged over the tongue 48 after it is folded over the cross bar 47, and the edges of the valve-forming portions being united in longitudinal seams 60 and 61. At the forward edge of the inlet valves the material forms a circular edge 62 which is clamped outwardly into a groove 63 in the inner face of the bag ring by a split spring ring 64, preferably formed of wire.

While it is usually preferable that the bag compartments be open at the top, for convenience in emptying them, it will be evident that the upper end of the bag may be closed, as shown in Figs. 14 and 15. In such structure, the edges of the upper and lower bag portions 65 and 66 and the edges of the impermeable diaphragm 67 are sewed together not only along the sides but at the end of the bag, it being understood that, as in the other modifications, such internal seams are sewed while the bag is turned inside out.

The use of an impermeable diaphragm, as described, not only serves to prevent any undesirable back pressure, caused by one fan, from being imposed upon the other fan, and to prevent back currents from one fan in the outlet of the other fan, but enables the shape of the inflated bag to be modified, to a certain extent, if desired. It will also be evident that, when the handle of the cleaner is moved toward vertical position, which is the usual storage position, the diaphragm will act as a tension member, and will relieve the lower filtering portion of the bag from the tension which is exerted by the yieldable supporting means 24, thus prolonging its life.

It will be understood that, by changing the size and shape of the upper and lower filtering portions of the bag, the relative size of the compartments may be varied, if desired. It will also be understood that the bag and diaphragm may be made in one piece, if desired, the diaphragm-forming portion being rendered impermeable to air by treatment with suitable material, and that many similar changes can be made in the details of construction within the scope of the invention, which is defined in the appended claims.

What is claimed is: —

1. A dust filtering bag for a suction cleaner, having an inlet opening at one end and having a diaphragm impervious to air arranged substantially diametrically thereof and bifurcating said

opening and said bag to divide said bag into separate non-communicating compartments.

2. A dust filtering bag for a suction cleaner, comprising a tube of air-pervious material open at each end and a diaphragm extending longitudinally therein from end to end thereof and connecting at its side edges to said bag to form separate non-communicating pockets when one end of said bag is closed.

3. A dust filtering bag for a suction cleaner, formed of air-pervious material and having an inlet opening at one end, said bag having a diaphragm therein extending from the inlet opening to the other end and connected at its sides to said bag, said diaphragm being formed of inextensible material and the length of the medial portion of said diaphragm being less than the length of the medial portion of the lower part of said bag.

4. The combination of a dust filtering bag for a suction cleaner, having an inlet mouth at one end and having a diaphragm therein dividing said bag into separate pockets and having a free edge adjacent said mouth, a ring having a web extending across it, means for detachably securing said bag mouth to said ring, and means detachably securing said free edge of said diaphragm to said web.

5. The combination of a dust filtering bag for a suction cleaner, comprising a tube of air-pervious material open at each end to form a mouth and a diaphragm therein extending from end to end of said bag and connected at its sides to said bag, a ring having a transverse web, the

mouth at one end of said bag being secured to said ring and the corresponding end of said diaphragm being secured to said web, and means holding the mouth at the other end of the bag closed.

6. A dust filtering bag for a suction cleaner, having an inlet opening at one end and having a diaphragm impervious to air arranged substantially diametrically thereof and bifurcating said opening to divide said bag into separate compartments, and an inlet tube of flexible material extending from the inlet opening into each of said compartments, said inlet tubes being formed together as a unit.

7. The combination of a dust filtering bag for a suction cleaner, having a diaphragm extending substantially diametrically thereof and dividing the bag into separate compartments, a bag ring having a partition, said bag being secured to said partition, and an inlet tube in each of said compartments, said inlet tubes being formed as a unit and secured to said bag ring.

8. The combination with a suction cleaner having a plurality of air-moving means discharging through conduits terminating in adjacently positioned outlets, of a bag ring detachably secured to said conduits and having openings in line therewith separated by a partition, and a dust-filtering bag secured to said bag ring and having a diaphragm therein secured at one end to said partition and dividing said dust bag into separate compartments.

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