Aug. 6, 1940. W. LEATHERS 2,210,724

PUSH-BROOM-TYPE VACUUM CLEANER

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Fig. 2

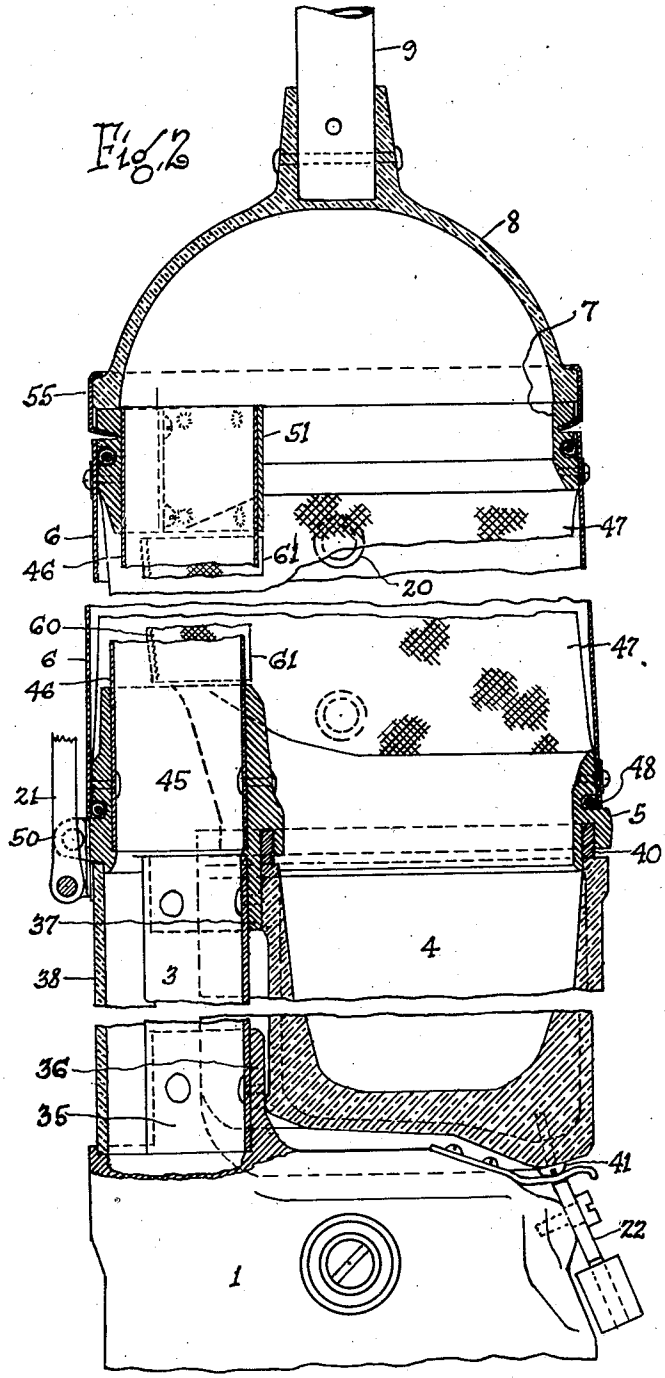


Fig. 1

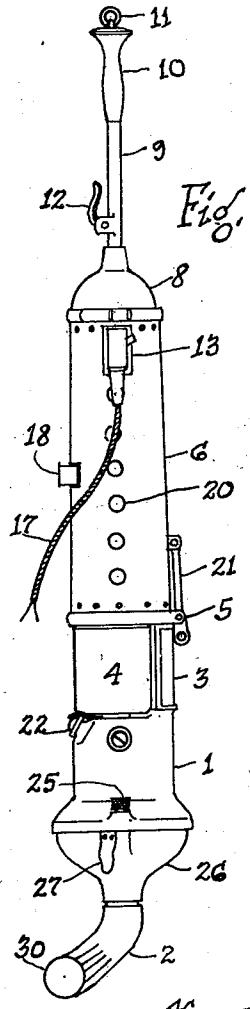


Fig. 3

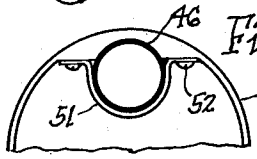
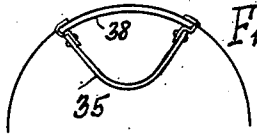


Fig. 4



INVENTOR.

Wm Leathers

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PUSH-BROOM-TYPE VACUUM CLEANER

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Fig. 5

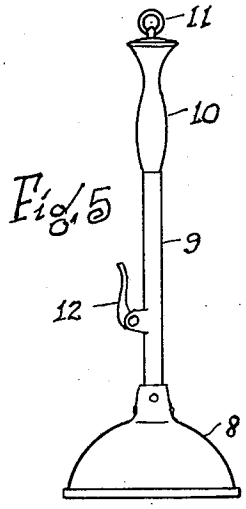


Fig. 6

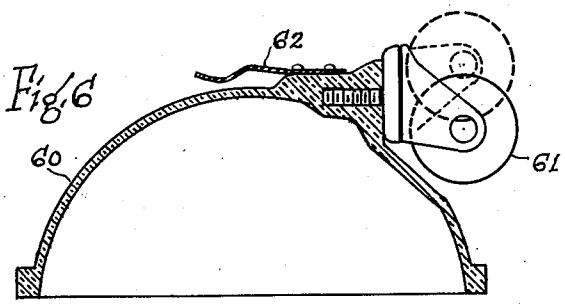
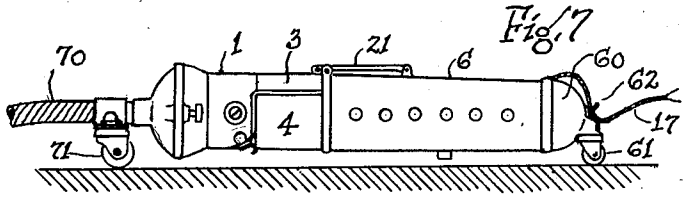


Fig. 7



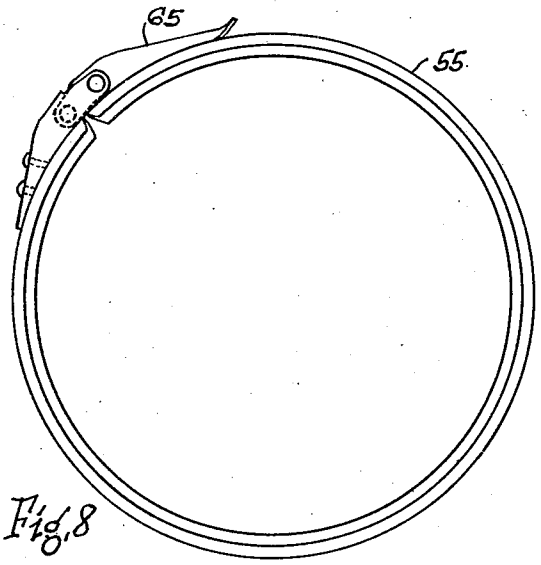


Fig. 8

INVENTOR
Ward Leathers

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UNITED STATES PATENT OFFICE

2,210,724

PUSH-BROOM-TYPE VACUUM CLEANER

Ward Leathers, New York, N. Y., assignor to Quadrex Corporation, New York, N. Y., a corporation of Delaware

Application December 18, 1937, Serial No. 180,530

3 Claims. (Cl. 15—16)

The object of my invention is to improve the type of vacuum-cleaner set forth in my patents, Nos. Re. 20,286; 2,073,489; 2,122,179; and 2,187,-164. My type of vacuum cleaner may be briefly described as a motor-suction-unit, a dirt-receptacle and up-draught dirt-laden-air connector-duct comprising a middle section, an elongated cylindrical filter having a rigid cylindrical cover adjoining said middle section, enclosing top or cap for said filter section supporting an operator's handle, and with all of the aforerecited elements rigidly joined together forming a substantially annular unit substantially co-axial with the motor axis.

More detailed objects of my invention consist of providing a rigidifying member between the motor-suction-unit and the filter-unit which will occupy the least possible space between the dirt-receptacle and the up-draught dirt-laden-air connector-duct, as well as an almost complete transparency through this so-called middle section of the machine.

Another object is to obtain a rigid reenforcement from one end to the other of the filter aiding the light, rigid, filter-cover in stiffening the machine.

A further object is to provide interchangeable filter tops wherein one may be built rigidly with an operator's handle for push-broom-type operation on the floor, and the other be provided with a caster for canister-type operation on the floor.

In order to set forth my invention in understandable terms, I have provided this specification, to which is appended drawings, of which:

Figure 1 shows a side elevation of my push-broom-type machine.

Figure 2 shows a partially sectional longitudinal view of machine from motor-suction-unit to operator's handle.

Figure 3 is a diagrammatic, partial plan view of machine with filter-cap removed.

Figure 4 is a diagrammatic representation of a cross-section of the up-draught dirt-laden-air connector-duct.

Figure 5 shows one of the interchangeable filter tops in elevation.

Figure 6 shows the other in longitudinal cross section.

Figure 7 shows the application of a caster-top for canister-type use.

Figure 8 shows a hose-clamp-type attachment for interchangeable filter-tops.

A motor-suction-unit 1, Figure 1, has removably joined to it a cleaning nozzle 2. An up-draught dirt-laden-air connector-duct 3 lies side by side with a dirt-receptacle 4, and is rigidly joined to the motor unit 1. A die-cast spider 5 rigidly joined to the other end of the dirt-connector-duct 3 is rigidly joined to a cylindrical filter cover 6, which in turn is rigidly joined to a die-cast ring 7 at its upper end. To this ring is removably clamped a filter-cap 8 rigidly joined to an operator's handle 9, having a handle grip 10, hang-up ring 11, and cord hook 12. On the side of the cylindrical filter-cover 6 is a switch 13, a supply cord 17, and a shaker tab 18 projecting from the inner filter through the rigid cover. The filter cover is also provided with ventilating ports 20 and a collapsible handle 21. Suitable means of holding the dirt-receptacle in place is shown at 22. The motor-suction-unit has manual release 25 for the blower fan casing 26 which carries a lower cord hook 27. The floor nozzle 2 is provided with yieldable wheels 30 at each end.

A channel of sheet-steel 35 (see Figure 4), firmly joined as by rivets to a flange 36 on the motor housing 1 at its lower end and similarly joined at its upper end to a flange 37 on the die-cast spider 5, provides rigidity between the motor-suction-unit and the spider. The front or outer side 38 of the connector-duct 3 is made of a bent sheet of transparent material such as cellulose acetate or Lucite. It is joined in a manner diagrammatically illustrated in Figure 4. The spider 5 holds within a recess a rubber gasket 40 against the dirt-receptacle 4 is seated in an air tight manner by any suitable latching means—suitable means being shown as spring-cam-lever-and handle 22. An adjusting screw 41 in the bottom of the receptacle permits of adjustment of tension against the rubber gasket. The spider 5 is further provided with a round socket 45 into which a connector-tube 46 within the filter is firmly seated and rigidly attached as by rivets. The spider is further provided with a groove 48 into which a welt sewn on the lower end of the filter 47 is impressed and held by means of the outer filter-cover 6, which is joined to the spider in rigid manner as by screws. The spider 5 is also provided with anchorage 50 for the handle 21. The up-draught dirt-laden-air-tube 46 is joined to the upper die-cast ring 7 by means of a bracket 51 spot welded thereto and held firmly to the ring 7 as by screws 52 (see Figure 3). The ring 7 is provided with attaching means for holding the filter 47, similar to those in the spider 5, and the filter-cover 8 may be joined thereto in similar manner. Sewn to the side walls of the filter 47 as at 60 may be a fabric sleeve 61 which may surround the up-draught-

tube 46 in such manner that dirt and debris cannot lodge in back of it.

It is, of course, understood that with my push-broom-type of vacuum-cleaner the dirt-laden air is carried to the top of the filter where it is obliged to make a U-turn on the inner spherical surface of the filter-cap 8, and thence pass downward through the open throat of the filter into the dirt-receptacle 4. Every available means must be used for keeping this entire passage free, smooth, and uninterrupted, otherwise the clinging character of loose pile taken from carpets will quickly obstruct the free flow of dirt. Where large wads of such nap or pile are sometimes quickly deposited in the filter-top interruption may occur, and it is highly desirable to make the filter-top 8 of transparent material, such as cellulose acetate or Lucite, and manually removable.

The top 8 may be joined to the die-cast ring 7 in any suitable manner as by side latches or by the hose-clamp-type of peripheral grip 55, as more fully shown in Figure 8. It is also desirable that the dirt-receptacle 4 be molded of transparent material such as those hereabove mentioned.

The filter-cap 8 may be rigidly joined to an operator's handle 9 and the entire unit, Figure 5, made manually removable from the machine.

A substitute filter cap 60, Figure 6, provided with swivel caster 61 and a service cord holder 62 may be used interchangeably with the cap and handle unit of Figure 5. The object of the interchange is to turn my push-broom-type machine into a canister-type machine for use with a cleaner hose (see Figure 7). A cleaner hose 70 is joined in swivelled manner to a horizontal, lateral bracket with a swivelled caster 71 on each end. These casters are spaced sufficiently wide apart to keep the machine from turning over on the floor while in use. Suitable juncture is made between the caster bracket and the motor-suction-unit, preferably in a manner similar to that of the floor cleaning nozzle 2, which it displaces. The cap 60 gives the machine a convenient length for canister-type use and permits a free rolling movement on the floor. A cord holder 62 keeps the cord from getting under the caster wheels.

A suitable means 55 of joining the interchangeable tops to the filter-top ring 7, Figure 8, is a hose-clamp-type with a locking lever 65.

Having set forth my invention in clear and understandable terms, it is evident that the details may be altered within the limits of present-day mechanical practice without departing from the spirit of my invention.

I claim:

1. In a vacuum cleaner having a motor-suction-unit, an upper and a lower ring-shaped spider-member disposed co-axially, a rigid hollow-member comprising an up-draught dirt-laden air-duct rigidly joined to the inner side-wall of the said spider-members, one on each end and spacing them apart, a substantially cylindrical fabric filter supported on its ends by the said spiders and surrounding the said spider-and-connector-duct-structure, a second but shorter rigid member rigidly joined between the said lower spider-member and the motor-suction-unit comprising an inner wall of a second duct, said wall furnishing the major structural rigidity to the cleaner and said second duct communicating with the first duct thereby forming a continuous enclosed passage for the up-draught dirt-laden air from the motor-suction-unit to the top of the filter, said second duct having an outer wall formed of transparent artificial resin, a dirt-receiving chamber disposed between said lower spider-member and the motor-suction-unit, side-by-side with the second said duct, and communicating through the spider with the chamber within the filter, and a removable cap and enclosing the top side of said upper spider-member, said cap having a substantially hemi-spherical inner surface for turning the dirt-laden air stream emitted from the upper end of the first mentioned air-duct through a U-turn.

2. A filtering-unit for a vacuum cleaner having an upper and a lower ring-shaped spider-member disposed co-axially and supporting a cylindrically shaped fabric filter between them, a rigid hollow member comprising an up-draught dirt-laden air-duct rigidly joined to the inner side-wall of the said spider-members, one at each end and spacing them apart, and with the said spider-and-connector-duct-structure substantially within the said fabric filter, means of joining the said lower spider in fixed relationship to the motor-suction-unit and of joining the dirt-laden-air outlet of that unit with the lower end of said air-duct forming a continuous enclosed passage for the up-draught dirt-laden air from the suction-unit to the top of the filter, an emptyable dirt-receiving chamber disposed between said lower spider-member and the suction-unit, laterally adjacent the said enclosed up-draught passage and communicating through the spider-member with the chamber within the filter, said means comprising a metallic channel forming the wall adjacent said dirt-receiving chamber, and a removable cap enclosing the top side of said upper spider-member, said cap having a substantially hemi-spherical inner surface for turning the dirt-laden air stream emitted at full motor-or cleaning-value from the upper end of the first mentioned air-duct through a full U-turn inscribed from one side of the cap to the other.

3. In a vacuum cleaner having a motor-suction-unit, an upper and lower ring-shaped spider-member disposed co-axially, a rigid hollow-member comprising an up-draught dirt-laden air-duct rigidly joined to the inner side-wall of the said spider-members, one on each end and spacing them apart, a substantially cylindrical fabric filter supported on its ends by the said spiders and surrounding the said spider-and-connector-duct-structure, a second but shorter rigid member rigidly joined between the said lower spider-member and the motor-suction-unit comprising a second duct communicating with the first duct thereby forming a continuous enclosed passage for the up-draught dirt-laden air from the motor-suction-unit to the top of the filter, a dirt-receiving chamber disposed between said lower spider-member and the motor-suction-unit, side-by-side with the second said duct, and communicating through the spider with the chamber within the filter, a removable cap enclosing the top side of said upper spider-member, and having a substantially hemi-spherical inner surface for turning the dirt-laden air stream emitted from the upper end of the first mentioned air-duct through a U-turn and an operator's handle co-axially joined to said cap for holding the cleaner so that dirt may fall by gravity through the filter.

WARD LEATHERS.