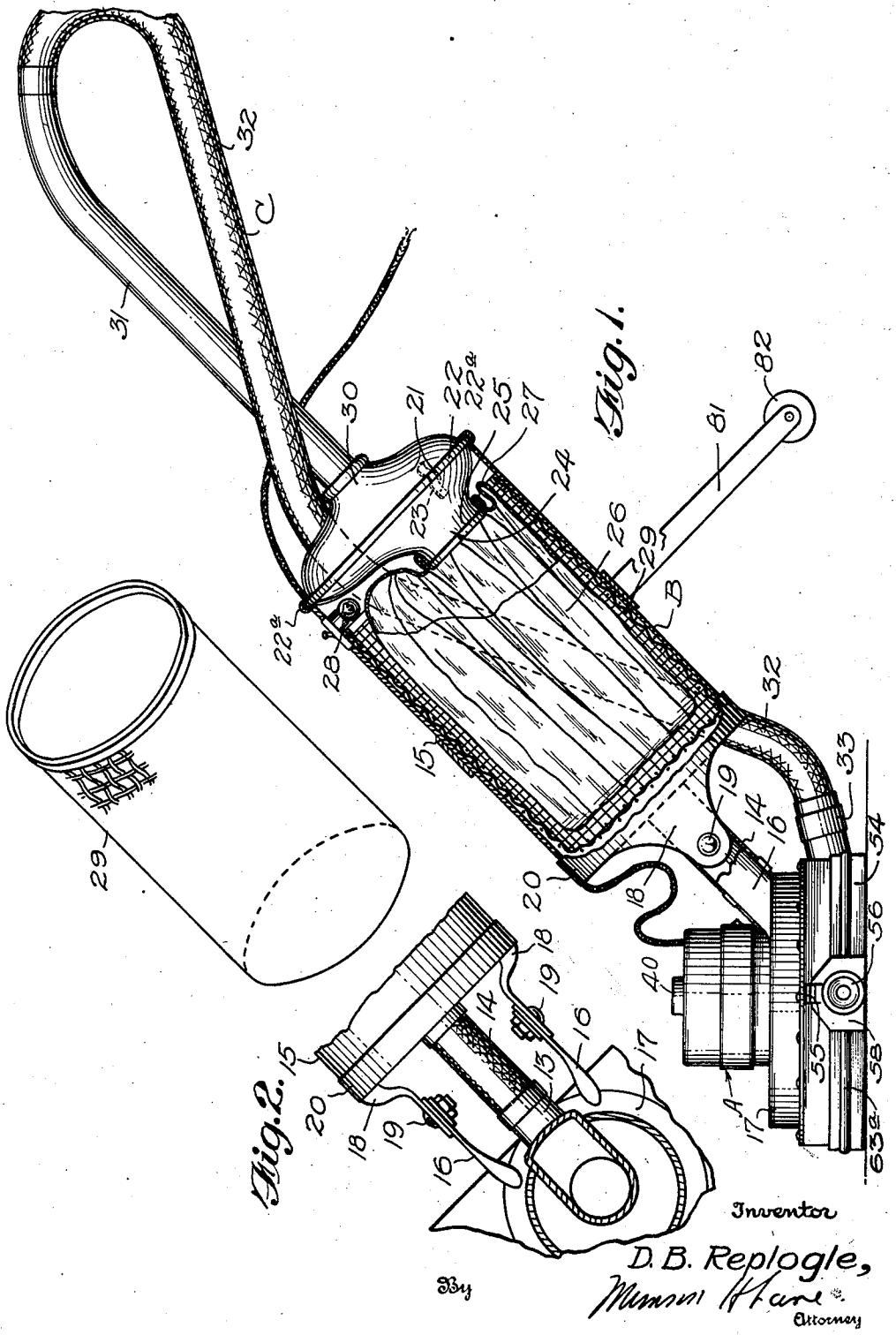
Aug. 13, 1940. D. B. REPLOGLE 2,210,950

SUCTION CLEANER

Filed Aug. 5, 1936 6 Sheets-Sheet 1



Aug. 13, 1940. D. B. REPLOGLE 2,210,950

SUCTION CLEANER

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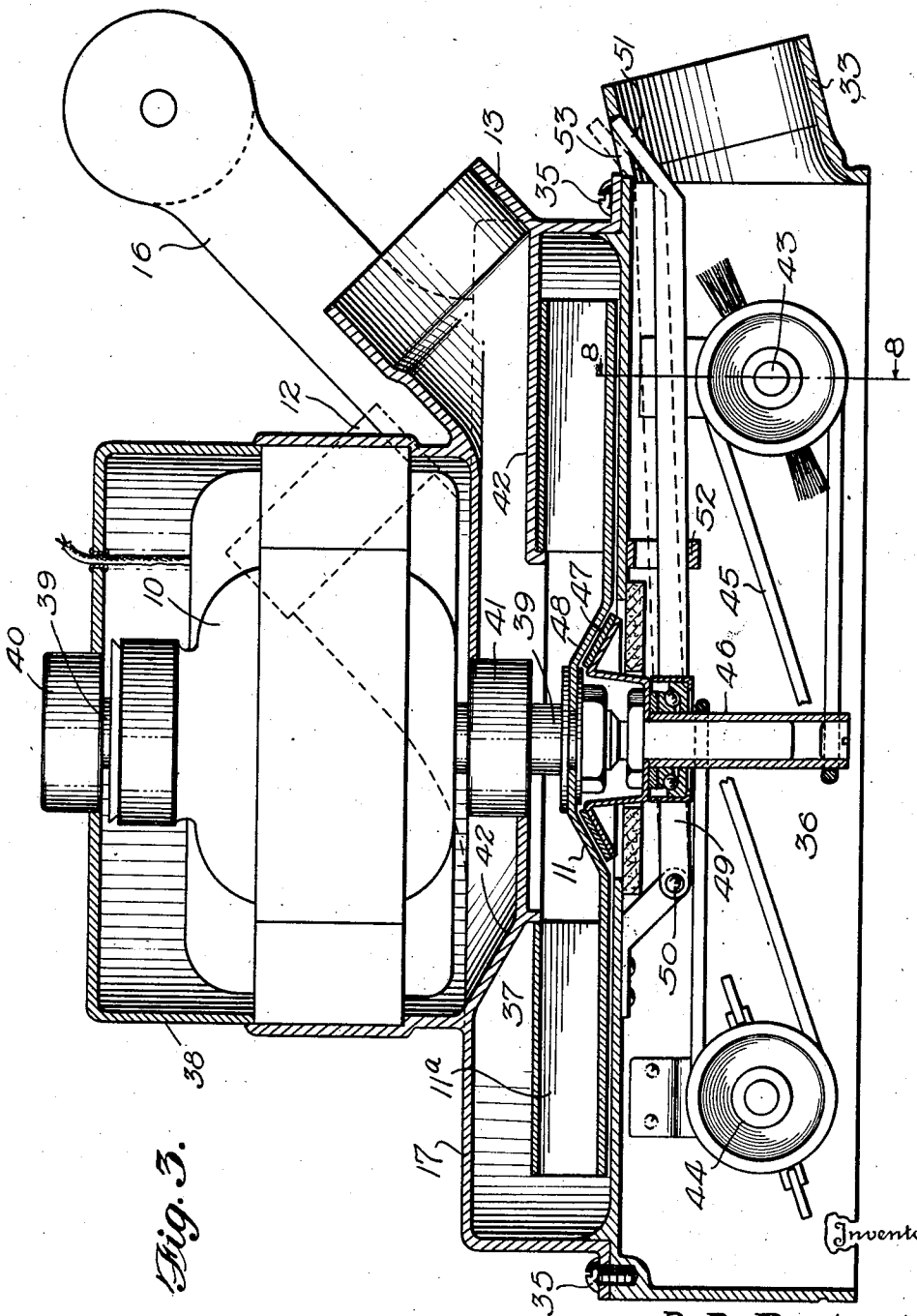

Fig. 3.

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By Marion Hare

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Aug. 13, 1940. D. B. REPLOGLE 2,210,950

SUCTION CLEANER

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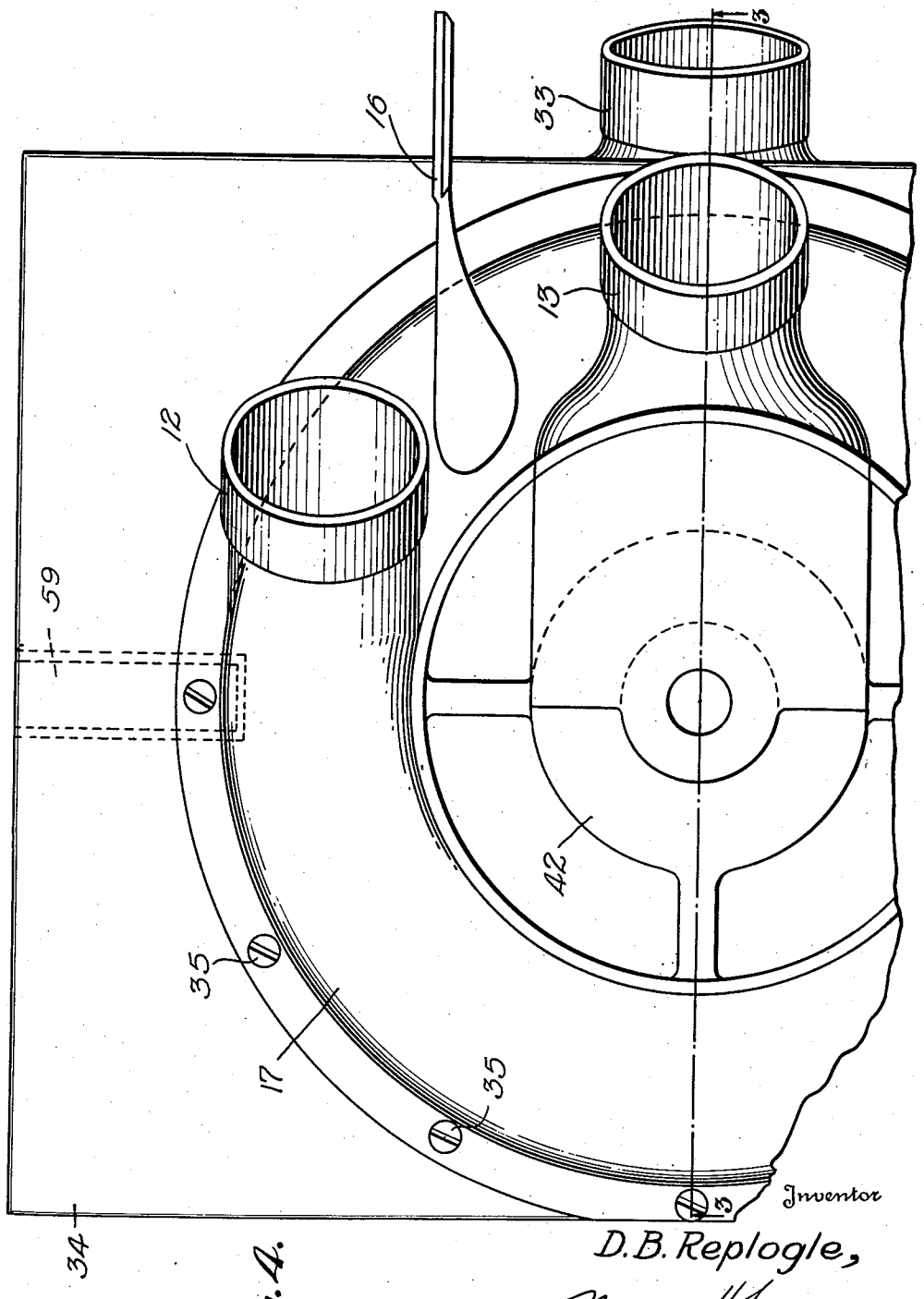

Fig. 4.

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Aug. 13, 1940. D. B. REPLOGLE 2,210,950

SUCTION CLEANER

Filed Aug. 5, 1936 6 Sheets-Sheet 4

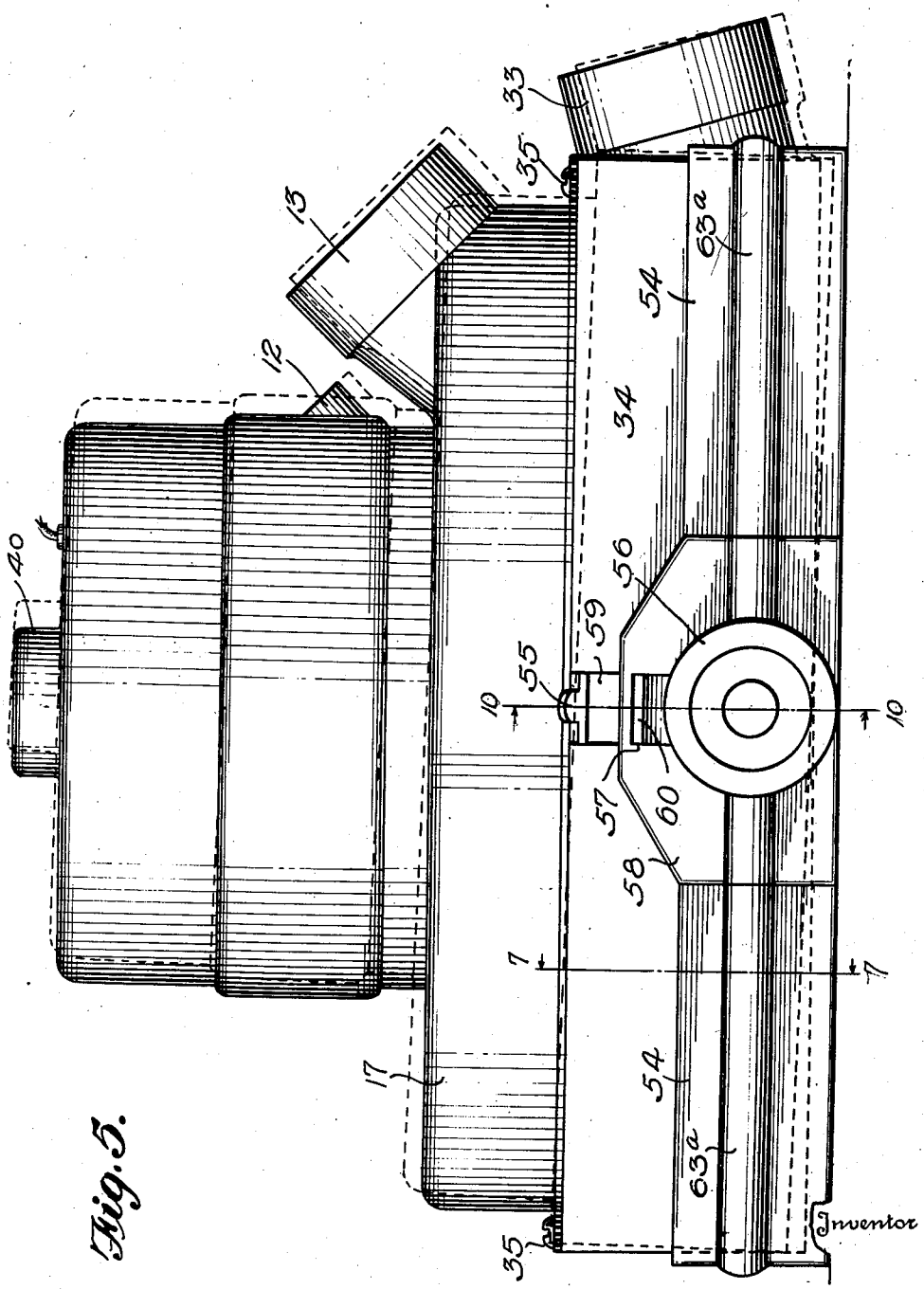

Fig. 5.

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Aug. 13, 1940. D. B. REPLOGLE 2,210,950

SUCTION CLEANER

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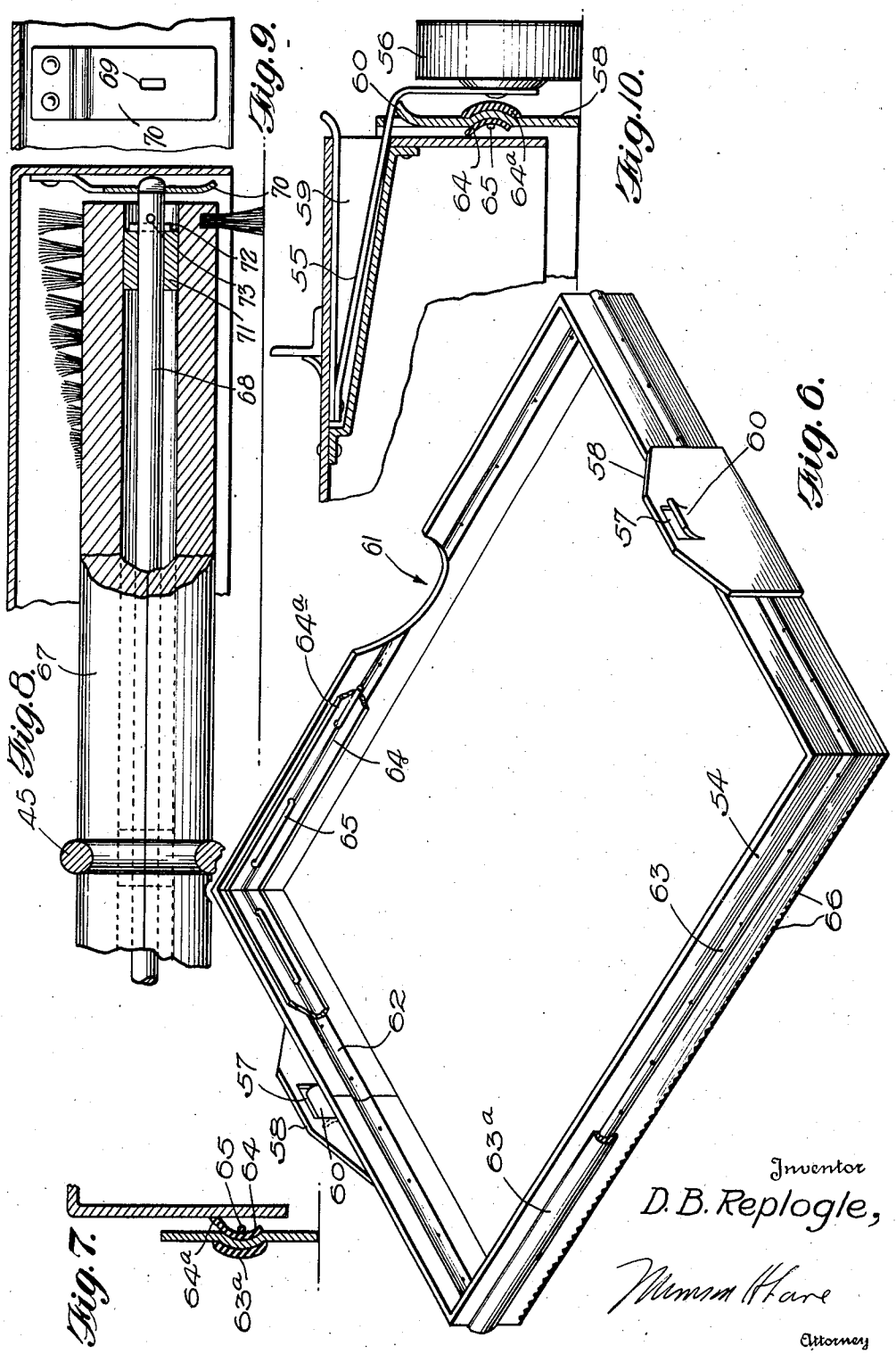

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SUCTION CLEANER

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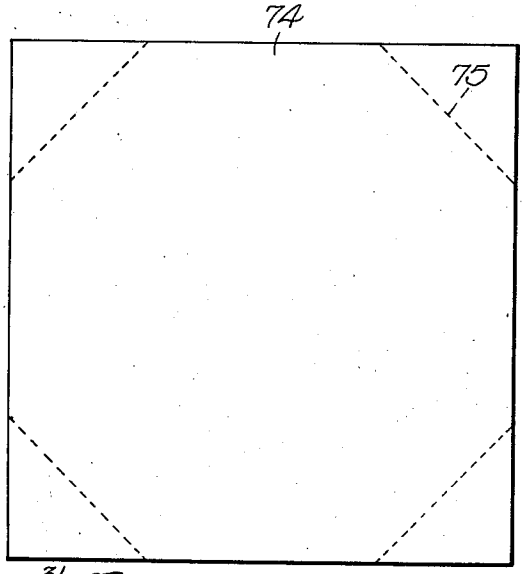


Fig. 12.

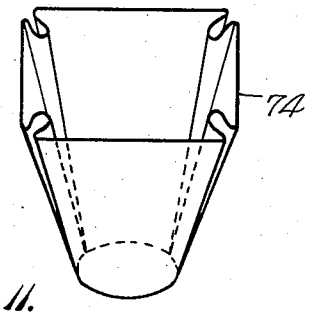
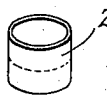
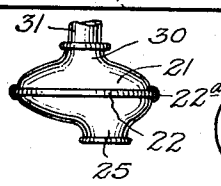


Fig. 11.

Fig. 15.





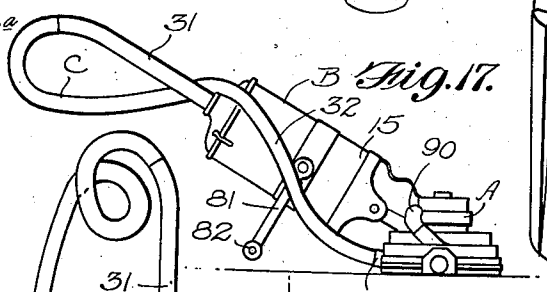


Fig. 17.

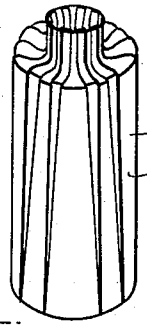


Fig. 13.

Fig. 16.

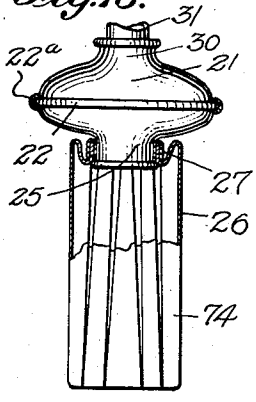


Fig. 14.

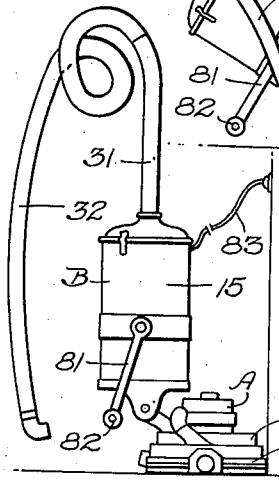


Fig. 19.

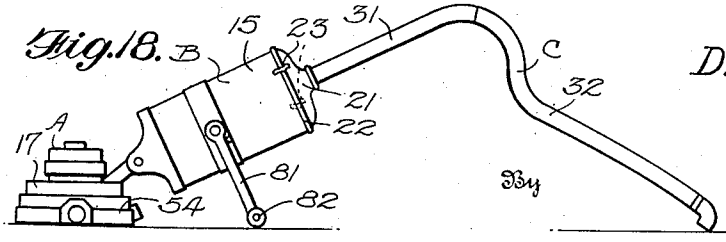


Fig. 18.

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Patented Aug. 13, 1940

2,210,950

UNITED STATES PATENT OFFICE

2,210,950

SUCTION CLEANER

Daniel Benson Replogle, Berkeley, Calif., assignor to The Ohio Citizens Trust Company, as trustee, Toledo, Ohio, a corporation of Ohio

Application August 5, 1936, Serial No. 94,439

18 Claims. (Cl. 15—9)

The invention relates to cleaning apparatus and more particularly to portable electric cleaners of the air-method type which may be selectively employed for floor cleaning purposes or, by the use of suitable extension devices may be employed for cleaning walls, draperies or the like.

One of the objects of the invention is to provide a floor tool for such apparatus, equipped with a pair of rotatable agitators, namely a brush and a beater, rotating in opposite directions. One of the effects of this arrangement is that the beater tends to move the nap of the carpet or other floor covering in one direction and the brush in the opposite direction while the combined action of the two agitators is to leave the nap standing substantially upright after having been thoroughly cleaned, especially when the brush and beating action is combined with the action of an air stream.

A further object of the invention is to provide an air-method cleaner with a hose detachable at the floor tool or suction box wherein the detachment of these hose auomatically disconnects the agitating devices from the source of power when the hose is to be used independently of the floor tool or suction box which houses the beater and brush.

Other objects will be apparent from a consideration of the accompanying drawings and the following detailed description, in which are set forth illustrative embodiments of the invention.

In the drawings:

Fig. 1 is a side view of the assembled device, parts being shown in elevation while the bag holder is shown in section for the purpose of disclosing the interior;

Fig. 2 is a fragmentary top plan view of the same portions being broken away for the purpose of illustrating details of construction;

Fig. 3 is a vertical sectional view of the floor tool taken on line 3—3 of Fig. 4;

Fig. 4 is a plan view of the floor tool with the motor dome and motor removed;

Fig. 5 is a side elevation of the floor tool with a surface engaging skirt attached thereto;

Fig. 6 is a perspective view of the skirt shown detached from the floor tool;

Fig. 7 is a detailed sectional view on line 7—7 of Fig. 5 showing the seal interposed between the skirt and the suction box;

Fig. 8 is a fragmentary view, partly in section and partly in elevation, showing a portion of the revolving brush and the mounting of the same in the suction box, the section being taken on the line 8—8 of Fig. 3;

Fig. 9 is a detailed view showing the yielding mounting for the brush shaft;

Fig. 10 is a fragmentary section on line 10—10 of Fig. 5 showing the roller support for the suction box and skirt;

Fig. 11 shows a rectangular paper sheet from which a seamless dust collector bag is to be formed;

Fig. 12 is a perspective view illustrating a step in the production of the bag;

Fig. 13 is a perspective view illustrating the bag at a further stage of manufacture;

Fig. 14 is a view showing the paper bag assembled with an outlet cap having a transparent cover;

Fig. 15 is a perspective view showing a rubber band which may be employed for securing the bag to the cap;

Fig. 16 is a detailed view of the cap;

Fig. 17 is a diagrammatical side view of the assembled cleaning apparatus illustrating one method of utilizing the same for floor cleaning purposes;

Fig. 18 is a diagrammatical side view of the assembled device illustrating the use of the hose extension pipe for floor cleaning purposes;

Fig. 19 is another diagrammatical view showing a method of operating the cleaner.

The apparatus comprises several principal elements which will be described in detail. The first of these is a wheeled floor tool A which encloses the power plant and suction producing means in the upper portion thereof, and a suction box or nozzle in the lower portion having agitating means actuated by the power plant. The second principal element is the dust collecting and air filtering device B which is swingingly and detachably connected to the floor tool and is equipped with a rigid suction pipe projecting therefrom which serves the function of a handle grip whereby the wheeled cleaner may be moved to and fro across the floor. The third principal element is a flexible, hollow extension member C, communicating with the filter element B which may either be connected to an outlet pipe leading from the suction box or nozzle or may be detached from said tool and used with or without auxiliary extension devices or tools for cleaning walls, ceilings, furniture or even the floor itself.

Referring to the drawings in detail, the floor tool A houses within its upper portion a suitable power plant or suction producing means which includes a motor 10 and a centrifugal fan 11 driven thereby having blades 11a at its periphery. This arrangement of elements is best shown in

Fig. 3. Air is discharged from the fan casing 17 through an outlet 12 shown in Fig. 4 and air is drawn into the fan casing through a centrally discharging intake 13. This intake, as best shown in Figs. 1 and 2, has connected thereto a flexible hose 14 or other equivalent connecting means, as, for example, the swinging elbow joint or a pair of such joints as illustrated in my Patent No. 2,009,435, dated July 30, 1935. The flexible hose 14 is connected at its opposite end to a tank or caddy 15 which houses the dust collecting and air filtering unit. The tank is preferably cylindrical in form and may be of metal, hard fibre, "Bakelite," or other suitable material. The caddy or housing 15 is swingingly connected to the floor tool by any suitable means. As shown in Fig. 2, a pair of bracket arms 16 are connected to the fan casing 17 and project upwardly and rearwardly therefrom on each side of the air inlet 13 and the hose 14. Corresponding arms 18—18 are carried by a removable cap 20 at the base of the caddy and these are hingedly connected at 19 to the arms 16. The connection 19 is preferably adjustable and may be made sufficiently tight so that the weight of the caddy and dust collecting means housed therein will be supported substantially rigidly, or the joint may be loosened to permit the caddy and handle projecting therefrom to be moved up and down to permit sweeping under furniture or other low objects.

The end of the caddy opposite the removable cap 20 is closed by a transparent cover 21 which may be of glass, Celluloid or other suitable material. This cover is shown as having a flange 22 covered by a U shaped rubber band 22*a* serving as buffer and as gasket, and may be detachably secured to the caddy proper by any suitable means as, for example, stirrup clamps 23—23. The lower half of the cap or cover is irregular in form and is provided with an eccentric opening 24 in a neck or nipple 25. Over this nipple the mouth portion of a dust collector bag 26 is drawn, such bag being preferably composed of porous paper or the like. The mouth of the bag is detachably secured by suitable means, as for example, by a folded over rubber band 27, the details of which are shown in Figs. 14 and 15.

Owing to the eccentric mounting of the nipple 25 a space is left in the upper portion of the caddy for a lamp 28 which serves to illuminate the transparent cap and to show the operator the quantity of dust being drawn into the filter.

A sustaining outer receptacle or bag 29, of wire, matting, or other coarse mesh netting is mounted within the caddy by the use of a suitable collar which frictionally fits the interior of the caddy or may be secured thereto by suitable fastening means, screws or the like. The collar may be of wood, hard fibre, leather, card board, or other suitable material. The inner paper bag is preferably seamless and is adapted to be withdrawn from the caddy as the cap 21 is removed.

The top of the cap 21 is provided with an opening 30 into which is fitted a tubular member 31 which is preferably rigid and is adapted to serve as the handle grip portion whereby the cleaner as a whole may be moved across the floor. The handle may be composed of hard fibre, "Bakelite," metal, or other suitable material and is preferably cemented or otherwise permanently secured to the cap 21 so that the handle serves as a means for withdrawing the cap and inner dust collecting bag from the caddy.

To the upper end of the tube 31 may be connected a flexible hose 32 to which may be secured any suitable cleaning tools, suction nozzles or extension devices. As shown in Fig. 1, the end of the hose 32 is fitted within an outlet pipe 33 of the floor tool nozzle, which nozzle is shown as formed by securing a rectangular box or casing 34 below the fan casing 17 by means of suitable fastening device 35, as illustrated in Figs. 3, 4 and 5. The suction box or casing 34 is fluid-tight and constitutes a true suction nozzle, the interior 36 of which is entirely cut off from the fan chamber 37 within the casing 17.

The details of construction of the floor tool A are best shown by reference to Figs. 3, 4 and 5. As illustrated, the fan casing 17 is substantially circular in form with a reduced housing 38 or top constituting the motor dome.

The motor shaft 39 is vertical and is provided with upper and lower bearings 40 and 41, respectively. As shown in Fig. 4 the lower bearing 41 is supported by a spider 42 which carries the inlet passage 13 leading to the fan motor. It will be noted that air from the inlet 13 enters the fan centrally, adjacent the lower bearing 41 and serves to cool said bearing. This construction would not be permissible were it not for the fact that the entering air has already been filtered, thus removing dust, lint and particles of string which would otherwise wrap around the motor shaft and interfere with its operation. The fan itself may be of a comparatively large size, say of a diameter of 10 inches or more, and it is preferably provided near the periphery with a rather large number of blades 11*a*, say a dozen or more. Where such a large diameter fan is used, the speed of the motor may be slowed down and the power is absorbed by the greater number of blades giving impulse to the moving air. Within the suction box 36 are preferably mounted a pair of rotatable agitators 43 and 44 which are adapted to be actuated in opposite directions by the motor shaft when a suitable clutch operated by inserting the end of the hose pipe 32 in the outlet 33 is actuated. As shown, the agitator 43 is in the form of a beater carrying flexible beating strips. For driving the agitators a belt 45 is wound about a sleeve or pulley 46 surrounding an extension of the motor shaft. This sleeve is provided with a cone clutch member 47 adapted to engage a similarly shaped portion 48 of the fan shroud. The clutch member 47 is carried by a spring lever 49 pivoted at 50 and having an up-turned resilient portion 51 at the end opposite the pivot. The lever 49 tends to drop by gravity until caught by a bracket 52 carried by the top of the suction box, thereby disengaging the clutch so that the agitators remain inoperative, but when the end of the hose 32 is inserted within the box outlet 33, this end engages the upturned cam portion 51 forcing it through a slot 53 in the outlet pipe, at the same time raising the lever 49 and engaging the clutch members 47 and 48.

The suction box 34 is preferably provided with a skirt 54 which is shown attached to the suction box in Fig. 5 and in Fig. 6 is shown detached and in detail. The skirt conforms in shape to the perimeter of the box but is slightly larger and is yieldingly supported on the box at two points by means of the spring shanks 55 of supporting rollers 56 with which the box is equipped. The rollers are mounted at opposite ends of the box and their shanks extend through slots 57 in upstanding ears 58 located at opposite ends of the skirt and into

end pockets 59 in the suction box. The assembly is best illustrated in Figs. 5 and 10. The rollers and supports may be of the type shown in my Patent 1,541,280, dated June 9, 1925, and in my Patent 1,994,868, dated March 19, 1935. Tabs 60 are struck out from the ears 58 in forming the slots 57 and these struck out tabs engage a portion of the roller shanks and serve to space the rollers at proper distance from the skirt.

The skirt may be of hard fiber, "Bakelite," or other suitable material that will not mar or soil the floor covering which it is adapted to engage. One side of the skirt is arcuately cut away as at 61 to allow for the outlet pipe 33 of the suction box and groove 62 is pressed out from the interior of the skirt forming a rib 63 on the outside over which a rubber bumper 63a is applied to prevent marring the furniture of other objects with which the tool may contact. Around the inside of the skirt a strip 64 is secured by means of staples 65, said strip having an inwardly projecting sealing edge 64a which is adapted to engage the outside of the suction box casing, as illustrated in Fig. 7 to form a fluid-tight connection. The lower edge of the skirt may be serrated, or notched, or grooved on one or more sides or ends as at 66 to permit air to enter to prevent sealing the skirt air-tight upon the floor or other surface.

In Fig. 8 I have shown details of construction of one of the agitators with which the suction box is equipped. As illustrated, it comprises a wooden roller 67 which is actuated by the belt 45. To the roller, bristles or beater elements may be applied, depending upon the type of agitator employed. Through the interior of the roller 67 extends a fixed shaft 68, the ends of which are tapered and squared and are adapted to be engaged in rectangular slots 69 formed in yielding flat springs 70 secured to the ends of the suction box or casing. As shown, the agitator is equipped with suitable end bearings, one of which is illustrated at 71, and end collars 72 held in place by pins 73. The mounting of the other agitator is similar and need not be described.

In Figs. 11 to 13 are illustrated the steps which may be employed in making the inner dust collector bag shown assembled in Fig. 1. Starting with a seamless square sheet of porous paper 74, the corners may be cut off along the dotted lines 75 forming an octagonal sheet. If desired a sixteen-sided sheet may be formed by again cutting off the corners of the octagonal sheet. The trimmed sheet is then pressed in at the center forming a cup-shaped member as illustrated in Fig. 12, after which the sides are fluted and the open end drawn into a mouth, as illustrated in Fig. 13. The bag so formed is seamless and being formed of porous paper is readily adapted to serve as a dust collecting and air filtering element. The bag 26 may then be secured to the dust cap 21, shown in Figs. 1, 14 and 16.

It will be noted that the paper bag is folded along its longitudinal edges and is somewhat collapsed lengthwise. Consequently when the bag is placed within the outer open mesh cage or receptacle 29 (Figs. 1 and 2) and air drawn thereinto, the bag will expand and engage the outer cage, as disclosed in my Patent 1,416,876, the cage serving to reinforce the paper bag to prevent breakage thereof just as in my aforesaid patent.

The operation of the cleaner apparatus will now be described. The fan motor 10 having been started, dust laden air will be drawn into the dust collector from any suitable tool attached to the end of the hose pipe 32, whether it be from the suction box 34 or from extension tools or the like connected to the hose as illustrated in my Patent 1,533,271, dated August 14, 1925, and also in Figs. 18 and 19 of the present drawings. The quantity of dust in the air entering the air filter will be clearly visible to the operator owing to the presence of the transparent cap illuminated by the lamp 28. The dust, lint, strings or other debris having been separated from the air by the filtering paper bag 26 which is supported by the outer bag 29, clean air is drawn centrally into the fan casing 17 through the inlet 13 cooling the lower bearing 41 of the motor, and is then discharged peripherally through the exhaust outlet 12. A short rubber extension 90 may be connected to the exhaust outlet 12 and arranged to direct the air against the motor dome for cooling the same as illustrated in Fig. 17. For this purpose a 90° rubber dusting tool, such as is disclosed in my Patent 1,994,871, dated March 19, 1935, may be employed.

A collapsible hinged bracket 81 may be secured to the body of the caddy, as illustrated in Figs. 18 and 19, such bracket having rollers 82 which cooperate with rollers on the suction box and support the cleaner and permit it to be moved to and fro across the floor, with a tubular member 31 serving as a handle grip when hose 32 is withdrawn from floor tool outlet 33 as in Fig. 18. The cleaner body may be clamped at any desired angle with reference to the floor tool, it being shown clamped in a vertical position in Fig. 19 with the electric cord 83 plugged into the wall.

When the suction box 34 is to be utilized for floor cleaning purposes, the end of the hose 32 is fitted into the outlet pipe 33 thereby engaging the turned up end 51 of the spring lever 49 and bringing clutch members 47 and 48 into engagement so that the agitators 43 and 44 will be actuated by the motor 10. Since the beater and brush are belted to rotate in opposite directions there will be no strain on the bearing of the pulley or on the motor shaft. The agitators may revolve at a relatively slow rate owing to the small diameter of the pulley or sleeve 46 to which they are belted. This permits the motor to drive the fan 11 at a sufficient peripheral speed to produce the necessary suction. The large diameter of the fan also makes possible the relatively slow rotation of the agitators.

When the cleaner is used upon a carpet with a deep nap, the beater tends to brush the nap in one direction and the brush to move it in the opposite direction. The combined action of the two is to leave the nap standing erect after the dust has been thoroughly cleaned therefrom.

By reason of the yielding connection between the skirt or floor engaging member 54 and the casing of the suction box, it is possible to tilt the floor tool slightly forwardly or rearwardly about the centrally mounted roller supports by simply raising or lowering the handle 31. While the main portion of the floor tool is tilted the mouth of the skirt, or surface engaged member 54, remains substantially flush with the surface being cleaned, as illustrated in Fig. 5. When the tool is tilted rearwardly by lowering the handle, the agitator 43 will be brought into frictional contact with the surface being cleaned and consequently will tend to move the apparatus forwardly, thus relieving the operator in whole or in part of the labor of pushing the cleaner. On the other hand, when the handle is raised, the

front agitator 44 will tend to move the apparatus in the opposite direction.

When a sufficient amount of dust has been collected from the filtering device, which can be determined by inspection through the transparent top of the cleaner, the cover may be withdrawn through the agency of the handle 31, the cap 21 carrying with it the inner paper bag 26 which is then separated from the cap by removing the rubber band 27 whereupon the paper bag and contents may be thrown away, burned or otherwise destroyed and a fresh bag attached to the cap and replaced in the caddy.

The amount of dust remaining on the surface being cleaned may be determined by the operator by simply glancing at the transparent cap during the cleaning operation and if the air being drawn in is relatively clear, it will be apparent that the surface has been adequately cleaned.

The invention has been described in detail for the purpose of illustration, but it will be obvious that variations and modifications may be resorted to without departing from the spirit of the invention.

I claim:

1. A suction cleaner including a nozzle, agitating means within the nozzle, a source of power, a conduit communicating at one end with a source of suction and having its other end detachably connectible to the nozzle, and means adapted to be actuated by contact with the end of said conduit for automatically connecting or disconnecting said agitator to or from said source of power according as the conduit is connected to or disconnected from the nozzle.

2. A suction cleaner including a nozzle, agitating means within the nozzle, a source of power carried by said nozzle, an elongated conduit communicating at one end with a source of suction and adapted to be detachably connected at its other end to said nozzle, and means for automatically connecting or disconnecting said agitator to or from said source of power according as the detachable end of the conduit is connected to or disconnected from said nozzle.

3. A suction cleaner including a nozzle, agitating means within the nozzle, a source of power, an elongated conduit communicating at one end with a source of suction and adapted to be detachably connected at its other end to said nozzle, a two-part clutch interposed between the agitating means and said source of power, and means for automatically engaging or disengaging the parts of said clutch according as the detachable end of said conduit is connected to or disconnected from said nozzle.

4. A suction cleaner including a floor tool or nozzle, suction producing means, air filtering means, and a suction pipe communicating at one end with the air filtering means, its other end being adapted to be selectively connected to or disconnected from said floor tool or nozzle, an agitator within said floor tool, means including an electric motor for actuating said agitator, and means for rendering said actuating means operative or inoperative according as the suction pipe is connected to or disconnected from the floor tool.

5. A suction cleaner comprising a dust collecting and air filtering device connected at one end to a source of suction, and having an intake for dust laden air at the other end, a suction pipe connected at one end to said intake and including a flexible portion and a suction floor tool adapted to be detachably connected to the free end of said flexible portion and having agitating means therein, power means also carried by said floor tool for actuating the agitating means, and means for automatically connecting or disconnecting the agitating means to or from said power means according as the flexible tube is connected to or disconnected from said floor tool.

6. A suction cleaner including a nozzle, a source of suction, including a fan and a fan motor, an agitator within said nozzle adapted to be actuated by said motor, an elongated conduit including a flexible portion, communicating at one end with said source of suction and adapted to be detachably connected at its other end to said nozzle, and means adapted to be actuated by contact with the detachable end of said conduit for automatically connecting or disconnecting said agitator to or from said motor according as the conduit is connected to or disconnected from the nozzle.

7. In a suction cleaner, a floor tool including a source of suction and a suction nozzle having a discharge outlet for dust laden air, a rigid suction conduit communicating with said source of suction and mechanically connected to the floor tool, said conduit constituting means for propelling the cleaner across the floor, air filtering means within the conduit, and a flexible tube connected at one end to the inlet end of said conduit, and adapted to be detachably connected at its other end to said nozzle outlet or to be separately used for cleaning purposes.

8. In a suction cleaner, a floor tool including a source of suction and a suction nozzle having a discharge outlet for dust laden air, a rigid suction conduit communicating with said source of suction and mechanically connected to the floor tool, said conduit constituting means for propelling the cleaner across the floor, air filtering means within the conduit, and a flexible tube connected at one end to the inlet end of said conduit, and adapted to be detachably connected at its other end to said nozzle outlet or to be separately used for cleaning purposes, agitating means within said nozzle, and means for automatically rendering said agitating means inoperative when the flexible tube is detached from the nozzle.

9. In a suction cleaner, a floor tool including a source of suction and a suction nozzle having a discharge outlet for dust laden air, a rigid suction conduit communicating with said source of suction and mechanically connected to the floor tool, said conduit constituting means for propelling the cleaner across the floor, air filtering means within the conduit, and a flexible tube connected at one end to the inlet end of said conduit, and adapted to be detachably connected at its other end to said nozzle outlet or to be separately used for cleaning purposes, agitating means within the nozzle, power means for actuating said agitating means, a clutch interposed between the power means and said agitating means and means for automatically engaging or disengaging said clutch according as the flexible tube is connected to or disconnected from said nozzle.

10. In a suction cleaner, a floor tool including suction producing means having a suction inlet and a discharge outlet, a suction nozzle constituting the mouth portion of the tool and having an outlet for dust laden air, a rigid suction conduit connected to said floor tool and communicating with said suction inlet, air filtering means within the conduit, and a flexible hose connected

at one end with the intake of said conduit, and adapted to be detachably connected at its other end with the discharge outlet of said nozzle, or to be separately used for cleaning purposes.

11. In a suction cleaner, a floor tool including suction producing means having a suction inlet and a discharge outlet, a suction nozzle constituting the mouth portion of the tool and having an outlet for dust laden air, a rigid suction conduit connected to said floor tool and communicating with said suction inlet, air filtering means within the conduit, and a flexible hose connected at one end with the intake of said conduit, and adapted to be detachably connected at its other end with the discharge outlet of said nozzle, or to be separately used for cleaning purposes, a motor for actuating said suction producing means, agitating means within said nozzle, adapted to be actuated by said motor, a clutch interposed between said motor and said agitating means, and means for engaging or disengaging said clutch according as the flexible hose is connected to or disconnected from said nozzle.

12. In a suction cleaner, a floor tool comprising suction producing means having a suction inlet and a discharge outlet, a nozzle portion separated from the suction producing means by a fluid tight wall, and having an intake mouth and a discharge outlet for dust laden air, a rigid conduit connected to the floor tool and communicating at one end with said suction producing means, air filtering means within said conduit, and a pipe connecting the air intake end of said conduit with the discharge outlet of said floor tool nozzle.

13. In a suction cleaner, a floor tool comprising suction producing means having a suction inlet and a discharge outlet, a nozzle portion separated from the suction producing means by a fluid tight wall, and having an intake mouth and a discharge outlet for dust laden air, a rigid conduit connected to the floor tool and communicating at one end with said suction producing means, air filtering means within said conduit, and a pipe connecting the air intake end of said conduit with the discharge outlet of said floor tool nozzle, said floor tool constituting a separate unit from said conduit and being separable therefrom.

14. A suction cleaner, including a nozzle, having a discharge outlet adapted to be connected to a source of suction, agitating means within the nozzle, a source of power for actuating said agitating means, means including a flexible hose for selectively connecting the discharge outlet with said source of suction, a two part clutch interposed between said agitating means and said source of power, and means for automatically engaging or disengaging the parts of said clutch according as the nozzle outlet is connected to or disconnected from the source of suction.

15. A suction cleaner, including a nozzle, having a discharge outlet adapted to be connected to a source of suction, agitating means within the nozzle, a source of power for actuating said agitating means, means for selectively connecting the discharge outlet with said source of suction, a clutch interposed between said agitating means and said source of power, and means for automatically engaging or disengaging said clutch according as the nozzle outlet is connected to or disconnected from the source of suction, said last named means comprising a hinged lever carrying one part of the clutch.

16. In a suction cleaner, a wheeled floor tool, including a fan casing in the upper part thereof and a suction nozzle in the lower portion, with a fluid tight separating wall therebetween, the fan casing having an inlet opening for filtered air and a discharge outlet, and the nozzle having an outlet opening, a dust collecting and air filtering device connected at one end to the fan inlet, a rigid suction pipe connected to said dust collecting element and adapted to serve as a handle for moving the apparatus to and fro across the floor, and a flexible tube connected to the suction pipe and adapted to be connected to the outlet opening of said suction nozzle or to be separately used for cleaning purposes.

17. A suction cleaner comprising a floor tool including a fan and a fan casing having an air inlet and an outlet, a fan motor housed above the fan casing, and a suction box below the fan casing but separated therefrom by a fluid tight wall, and having an outlet opening for dust laden air, agitating means in said suction box adapted to be actuated by said fan motor, dust collecting and air filtering means outside of said floor tool detachably connected at one end to the fan inlet, a flexible suction pipe communicating at one end with the inlet end of the filtering means, and adapted to be detachably connected at its other end to the outlet of the suction box or to be separately used for cleaning purposes, and means for automatically engaging or disengaging the agitating means to or from the motor according as the flexible suction pipe is connected to or disconnected from the suction box.

18. A floor tool for a suction cleaner, comprising a fan casing in the upper portion thereof, a suction nozzle in the lower portion, and a fluid tight wall dividing the two portions into two separate chambers, the fan casing having a suction inlet and a discharge outlet, and the suction nozzle having an inlet mouth and a discharge outlet, a fan motor above said fan casing having an extension of its shaft projecting through said fluid tight wall into said nozzle, and rotating agitating means within the nozzle actuated from said motor shaft extension, said agitating means comprising a pair of rotating floor engaging members located one in front of and one in rear of the motor shaft extension.

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