



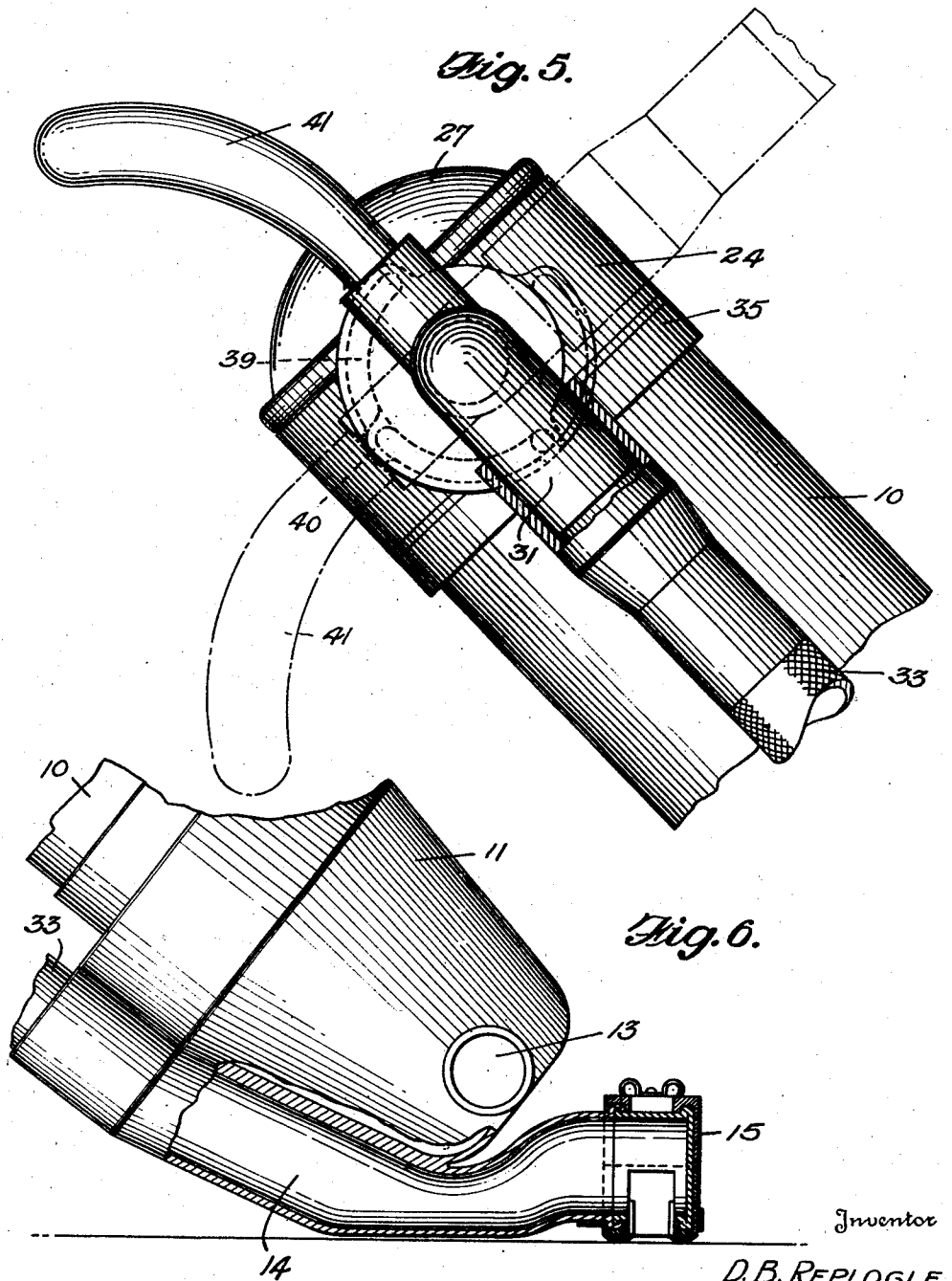
Oct. 10, 1939.

D. B. REPLOGLE

2,175,647

AIR-METHOD CLEANER ANTECHAMBER TYPE

Original Filed Dec. 28, 1936 5 Sheets-Sheet 2



Inventor

D. B. REPLOGLE,

By

Wm. H. Lane.

Attorney

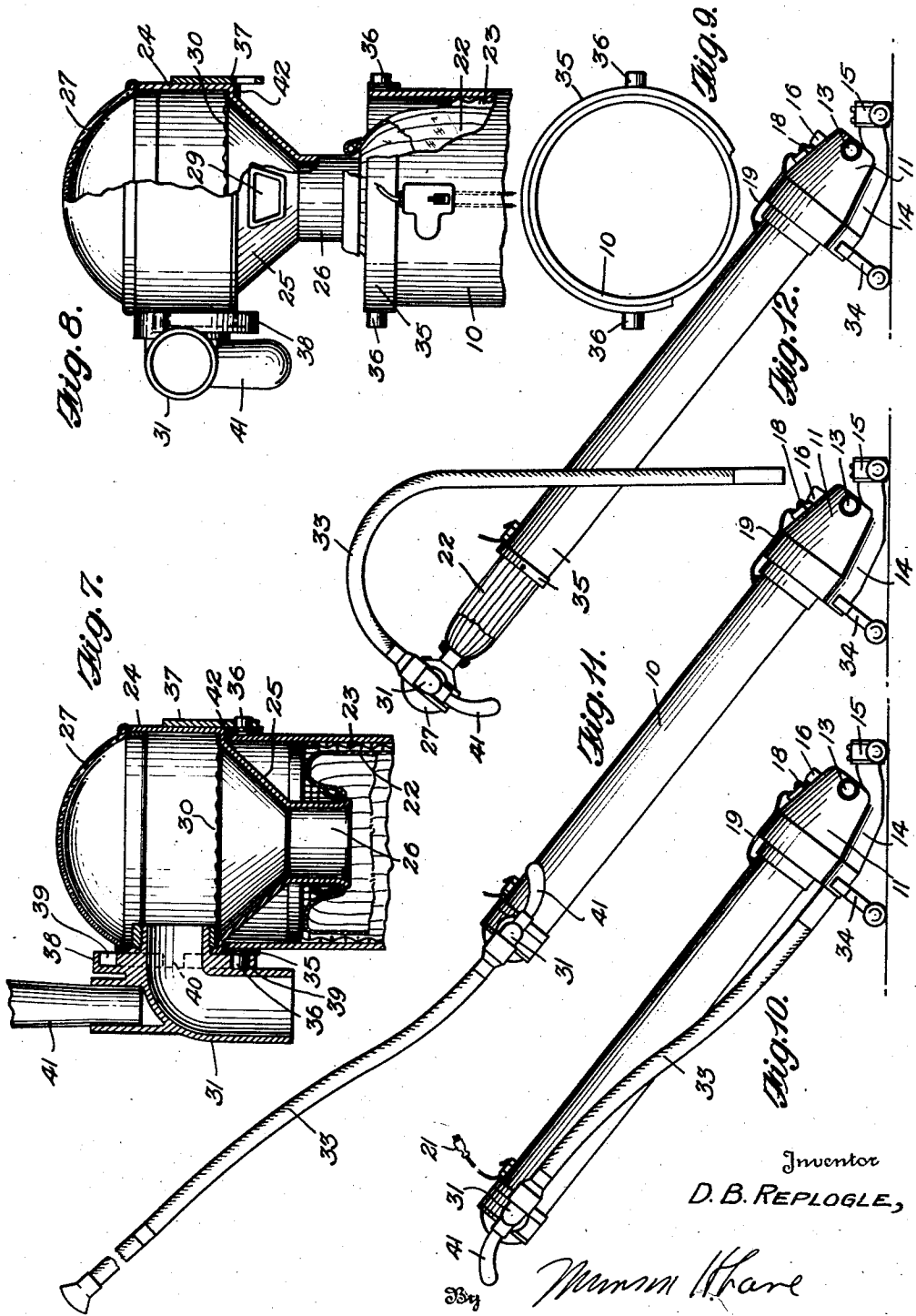
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Inventor  
D. B. REPLOGLE,

*Mumma & Hart*

Attorney



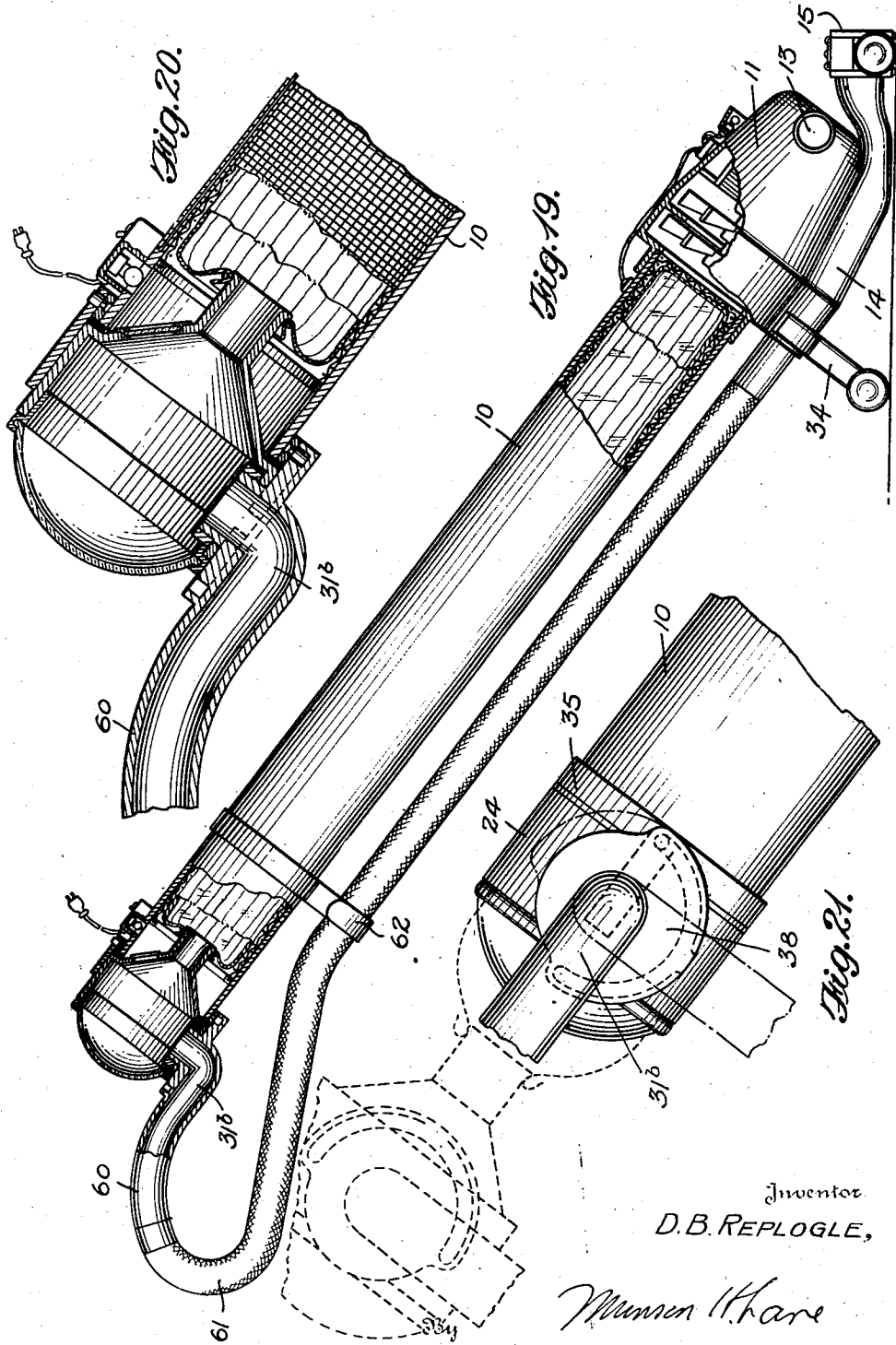
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D. B. REPLOGLÉ

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Inventor  
D. B. REPLOGLÉ,

Munson Khare

Attorney

# UNITED STATES PATENT OFFICE

2,175,647

## AIR-METHOD CLEANER ANTECHAMBER TYPE

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

Application December 23, 1936, Serial No. 118,013  
Renewed August 7, 1939

6 Claims. (Cl. 15-16)

The invention relates to cleaning apparatus and more particularly to portable electric cleaners of the air-method type which are adapted for use with suitably designed tools for ordinary floor cleaning purposes and which may also be employed for cleaning walls, ceilings, furniture and the like.

According to my invention the body of the cleaner includes a relatively slender tubular member which houses an air filter. An enlarged extension or casing is attached at one end of the slender tubular member and serves as a housing for the suction producing means, said casing being provided with discharge outlets at the end remote from the air filter housing.

A rotatable floor tool may be removably carried by the body of the cleaner, its outlet pipe being connected to the power plant casing. At the inner end of the tubular filter casing is a cap or ante-chamber, removable to permit emptying the dirt from the air filter or replacing the old filter by a new one. This cap is provided with an inlet for dust laden air which communicates with a pipe adapted to be connected to the outlet pipe of the floor tool, or to be removed from connection therewith and used for cleaning walls, furniture and the like. Means are provided for locking the cap to the top of the filter housing or caddy when the parts are in sweeping position and for releasing the cap for its removal when the parts are in an intermediate position. This locking and unlocking operation may be accomplished by means of a rotating member which is also adapted to serve as a handle grip for moving the cleaner to and fro across the floor and for withdrawing the cap.

Other features of the invention will be apparent from the accompanying drawings and the following detailed description in which are set forth for the purpose of illustration various specific embodiments of the inventive thought, it being understood that such embodiments are not intended to limit the invention to the precise details therein set forth.

In the drawings:

Fig. 1 is a side elevation of the apparatus in floor cleaning position, parts being shown in section.

Fig. 2 is a section on line 2-2 of Fig. 1 on a larger scale.

Figs. 3a and 3b are plan views of the upper and lower portions of the cleaner respectively.

Fig. 4 is a detailed view showing the clamping mechanism.

Fig. 5 is an enlarged side elevation of the upper

portion of the cleaner illustrating the mode of locking and unlocking the cap or ante-chamber from the caddy.

Fig. 6 is a detailed view showing the enlarged motor housing with the floor tool connected therewith through its outlet pipe.

Fig. 7 is a section on line 7-7 of Fig. 1.

Fig. 8 is a detailed view of the upper portion of the cleaner showing the cap or ante-chamber member partially removed from the caddy.

Fig. 9 is a detailed view showing the chime ring attached to the top of the caddy.

Figs. 10, 11 and 12 are side elevations largely diagrammatic in character illustrating the operation of the cleaner.

Fig. 13 is a side elevation showing a modified form of the cleaner wherein the filter remains within the caddy when the cap is removed.

Fig. 14 is a detailed view of the caddy cap assembly or ante-chamber member.

Fig. 15 is a detailed view showing the mounting on the upper portion of the air filter within the caddy.

Fig. 16 is a top view looking into the caddy in Fig. 15.

Fig. 17 is a view illustrating the locking and unlocking of the ante-chamber member.

Fig. 18 is a side elevation illustrating the mode of emptying the dust from the caddy.

Fig. 19 is a side elevation of another modification.

Fig. 20 is a section showing the interior of the ante-chamber and the upper portion of the caddy.

Fig. 21 is a view illustrating the locking and releasing of the ante-chamber member.

Referring to the modification illustrated in Figs. 1 to 12 inclusive, the cleaner comprises a caddy or body member including a slender tube 10 serving as a housing for the air filter and a somewhat enlarged extension 11 serving as a casing for the power plant 12 which serves to produce suction at one end and a blowing operation at the other. As illustrated the power plant includes an electric motor and multiple fans driven thereby. The caddy members 10 and 11 may be composed of any suitable light weight material as hard fiber, Bakelite or aluminum, but preferably non-conducting materials such as fiber or Bakelite are employed. The joint between the two sections may be made fluid tight but separable by shrinking the nipple on the extension member over the end of the tube 11, this being accomplished by soaking and subsequently drying the nipple where the parts are composed

of hard fiber or hygrometric material, as more particularly described in my application Serial No. 97,057 filed August 20, 1936.

As shown the extension member 11 is provided with a pair of laterally extending outlets 13 to either or both of which extension tubes may be applied and the device employed as a blower as for example when it is desirable to blow the dust into close proximity with the floor tool. In the embodiment shown an outlet pipe 14 for the floor tool 15 is formed integrally with the motor casing as by casting. The floor tool 15 is preferably reversible and of the double mouth type illustrated in my application Serial No. 105,789 filed October 15, 1936, which application may be referred to for details of construction of said floor tool.

At the lower end of the motor casing adjacent the reversible floor tool there is provided a casing 16, the interior of which may be formed as a reflector which contains a lamp 17 adapted to illuminate the floor while the sweeping takes place. The lamp is provided with an extension cord 18 which in turn may be supplied from the cord 19 that supplies current to the power plant. Suitable plugs may be provided so as to permit separation of the members 10 and 11 of the caddy. As shown current is supplied through a conductor 20 passing through the tube 10 which in turn is provided with a plug 21 adapted to be attached to an extension cord supplied from the wall socket or the like. Where the tubular members 10 and 11 are composed of non-conducting material it will be apparent that all danger of short circuiting is avoided.

The tubular member 10 may be light, small and neat in appearance. Such a tube is very cheaply constructed particularly where hard fiber is employed and is adapted to receive a high polish. The tube may be replaced at any time and is readily attached or detached from the member 11 permitting repairs to the motor and access to the air filter. Any suitable air filtering and dust collecting means may be employed within the tube 10 but I prefer to use the combination of an inner paper dust collecting bag 22 and an outer reinforcing net fabric 23 which may be of coarse mesh cloth, wire, or the like and which serves to prevent direct contact of the inner bag with the walls of the casing, thus insuring a free flow of air.

As shown the upper end of the tube 10 is provided with a cap or ante-chamber member generally designated by the numeral 24. In the embodiment now being described the inner bag 22 is attached to the cap or ante-chamber member but may be separate therefrom as illustrated in a modification to be later described. The cap or ante-chamber member includes a funnel 25 having a reduced neck 26 to which the mouth of the paper bag is suitably attached in such a manner as to permit ready removal of the bag and ready replacement of a new bag.

The ante-chamber member or cap may be provided with a transparent top 27 to permit viewing the interior and if desired a lamp 28 may be employed for illuminating the interior. A lower transparent window 29 in the wall of the funnel 25 may also be employed. Preferably a netting 30 extends across the interior of the cap to prevent solid particles from entering the bag.

At one side of the cap or ante-chamber is mounted a rotatable L or nipple 31 which communicates with the interior of the cap and through which dust laden air enters. As shown

a deflector 32 is provided at the mouth of the nipple and within the cap which is adapted to impart a whirling motion to the air and particles of dust entering the cleaner. To the nipple there is attached a tubular extension 33 preferably in the form of a flexible hose having a rigid portion at the remote end thereof which is adapted to serve as a nozzle or as a connection to the outlet pipe 14 of the floor tool, the connection being removable. A wheeled bracket 34 may be connected to the pipe 14 to serve as a support for the weight of the cleaner, this wheeled bracket acting in cooperation with the wheels at the ends of the floor tool. Suitable means are provided for locking and unlocking the ante-chamber or cap. The cap is adapted to be locked when the cleaner is in working position and unlocked when it is desired to remove the cap for emptying or replacing the air filter.

As shown the housing 10 is provided with a chime ring 35 at the upper end thereof (Fig. 9), such ring being provided with a pair of laterally extending lugs 36. The cap member is provided with a loop 37 adapted to fit over one of the lugs. The rotatable nipple or L-member 31 has associated and rotatable therewith a clamping ring 38 having a cam groove 39 within which the other lug 36 is adapted to fit, there being an opening 40 adjacent the center of the cam groove to permit the lug to enter or to be withdrawn. A handle grip 41 may be associated with the clamping mechanism such grip serving also for moving the cleaner to and fro across the floor and serving also as a handle for withdrawing the cap when released from the caddy. This handle also serves to lift the end of the hose pipe 33 from its socket in the end of the floor tool outlet pipe 14 when the handle is turned downwardly as indicated in Fig. 11. A suitable gasket 42 of rubber or the like material is inserted between the cap and the top of the caddy, said cap being compressed as the handle grip is rotated with its cam action. When the lug 36 is at one or the other end of the cam groove the gasket will be tightly compressed and a fluid tight fit insured.

The operation of the cleaner is indicated in Figs. 10, 11 and 12. In Fig. 10 the cleaner is shown in working position for ordinary floor sweeping purposes, the handle grip being turned upwardly and the end of the suction pipe 33 being inserted in the floor tool outlet pipe. The cleaner may be drawn to and fro across the floor to perform the ordinary sweeping operation.

In Fig. 11 the handle grip has been moved to the downward position and the tube 33 may then be employed with suitable extension tools for cleaning walls, ceilings, furniture and the like.

When it becomes necessary to remove the cap for emptying or replacing the cleaner bag, the handle grip is moved to a position intermediate the two positions shown in Figs. 10 and 11 as illustrated in Fig. 12. This permits the lug 36 to be withdrawn through the opening 40 in the cam groove. The cleaner bag may then be separated from the ante-chamber or cap member and replaced by a new bag, the old one being destroyed together with the contents thereof.

The arrangement shown in Figs. 13 to 18 inclusive is similar to the embodiment previously described. In this form however the L-member 31a is located below the cap instead of at one side as in the previously described embodiment. In this modification the dust collector is shown as adapted to remain with the caddy when the cap is removed. Any suitable form of dust collector

may be employed but as shown such dust collector includes an inner paper bag 50 and an outer receptacle 51 of coarse mesh material such as cloth, wire or the like. The cap is adapted to be removed or replaced in a manner similar to that described in the previous embodiment, by simply rotating the handle grip 41a in the proper direction. Also the extension pipe 33a is adapted to be separated from the floor tool outlet pipe in a similar manner.

In Figs. 19 to 21 inclusive a further modification is illustrated. This modification is similar to the other two forms illustrated except that the L-member 31b is extended as at 60 to form a suction handle to which the flexible tube 61 is attached, said tube serving as a cushion in the event the cleaner is dropped, so as to prevent breaking of the handle. A hook or the like 62 attached to the filter housing may be employed for holding the flexible tube. It will be apparent that the lower end of the flexible tube is adapted to be applied to or removed from the socket at the end of the floor tool outlet pipe in the manner previously described and the cleaner may be used either for floor sweeping purposes or for cleaning walls, ceilings, furniture and the like.

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

For example, it will be obvious that various forms of floor tools may be employed with the apparatus, as substitutes for the one herein specifically illustrated, suitable types being shown for example in my Patents Nos. 1,167,219 dated Jan. 4, 1916; 1,345,550 dated July 6, 1920; 1,994,868 dated Mar. 19, 1935, and in Replogle and Queen Patents Nos. 1,994,872 dated Mar. 19, 1935; 2,012,287 dated Aug. 27, 1935; 2,017,770 dated Oct. 15, 1935. Moreover the tool herein illustrated may be employed with suitable waxing and polishing attachments as set forth in my Patent No. 2,051,058 dated Aug. 18, 1936. Where a tool is employed having a stub outlet pipe and an oblique joint permitting reversal of the tool, the stub pipe may be attached to the pipe 14, permitting removal and replacement of the tool as illustrated for example in my application Serial No. 56,384 filed December 27, 1935, now Patent 2,146,763, and in my application Serial No.

95,414 filed Aug. 1, 1936. Whenever desired one floor tool may be substituted for another. This may be readily accomplished where the floor tools are made removable and interchangeable as contemplated in my various patents and pending applications.

I claim:

1. In a suction cleaner, an air filter adapted to be connected to a source of suction, a housing for said air filter, a removable cap for said housing, an air inlet pipe section carried by said cap and movable relative thereto, and means actuated by movement of said pipe section relative to the cap for locking or unlocking said cap with reference to the housing.

2. A suction cleaner as set forth in claim 1, wherein the air inlet pipe is mounted at one side of the cap.

3. In a suction cleaner comprising an air filter adapted to be connected to a source of suction, a housing for said air filter, a removable cap for said housing, a handle grip portion carried by said cap and movable relative thereto, and means actuated by movement of said handle grip relative to the cap for locking said cap to said housing; the improvement wherein the handle grip portion is hollow and serves as an inlet for dust laden air entering the housing.

4. A suction cleaner as set forth in claim 3, wherein a suction pipe is connected to said housing grip member at one end and the other end is connectible with a floor tool rigidly connected to the body of the cleaner.

5. A suction cleaner comprising a housing containing an air filter, adapted to be connected to a source of suction, a floor tool rigidly connected to said housing, a suction pipe communicating at one end with said air filter, and a movable handle connected to the suction pipe which handle in one position permits the suction pipe to be connected to said floor tool and in another position serves to withdraw the pipe end from communication with the floor tool.

6. A suction cleaner as set forth in claim 5, wherein the housing is provided with a removable cap having an inlet for dust laden air from said suction pipe, said handle being carried by said cap, and means actuated by movement of said handle for locking or unlocking the cap to or from said housing.

DANIEL BENSON REPLOGLÉ.