F. E. ROBERTSON.

SUCTION CLEANING APPARATUS.

APPLICATION FILED AUG. 7, 1915.

1,415,053. Patented May 9, 1922.

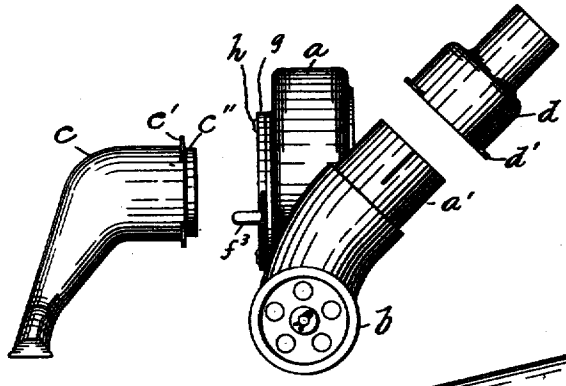



Fig. 1




Fig. 4

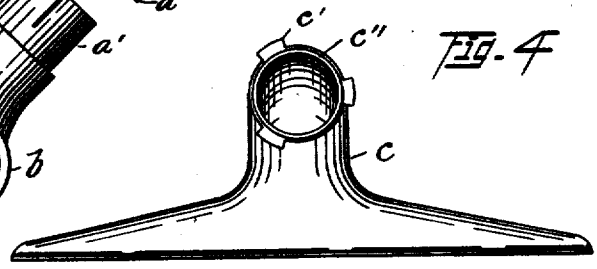



Fig. 3

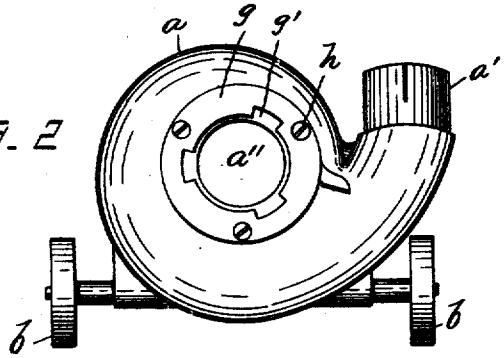



Fig. 2

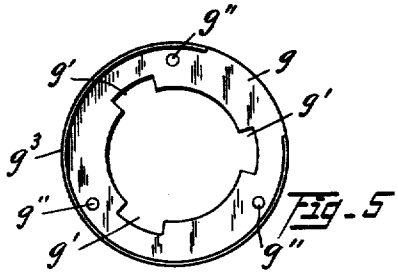



Fig. 5

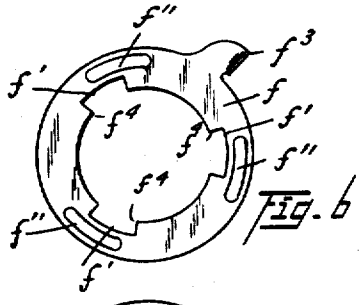



Fig. 6

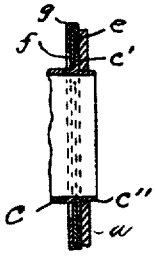



Fig. 8

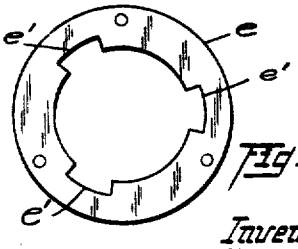



Fig. 7

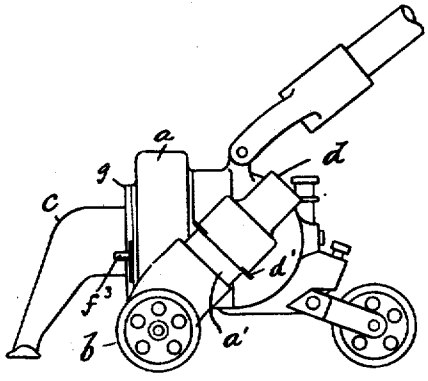



Fig. 9

Inventor
Frank E. Robertson

By Albert [illegible]
Attorney

# UNITED STATES PATENT OFFICE.

FRANK E. ROBERTSON, OF CLEVELAND, OHIO, ASSIGNOR TO THE P. A. GEIER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## SUCTION CLEANING APPARATUS.

1,415,053. Specification of Letters Patent. Patented May 9, 1922.

Application filed August 7, 1915. Serial No. 44,283.

*To all whom it may concern:*

Be it known that FRANK E. ROBERTSON, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, has invented certain new and useful Improvements in Suction Cleaning Apparatus, of which the following is a specification.

My invention relates to improvements in suction cleaning apparatus, and more particularly to a portable suction cleaner with which it is desirable to employ alternative or interchangeable tools. My improvements relate principally to a flush-connecting device for the vacuum cleaning nozzle, and one which is adapted to afford an air tight joint therefor. Alternatively there may be attached a coupling for a suction hose, which coupling preferably may be used as well upon the blower outlet of the vacuum cleaning device.

For the purpose of storing and shipping vacuum cleaners, it is desirable to place the same in a small compass, provided the device may be assembled by an unskilled person, without the use of tools. This is in addition to the desirable feature of affording an alternative hose connection, which may be applied to the vacuum cleaner, and both of these functions are secured by the structural features which I may better explain in connection with the accompanying drawings, wherein:—

Fig. 1 is a view in side elevation of a vacuum cleaning appliance embodying my invention, with its connections in position for attachment.

Fig. 2 is a front view of the fan chamber and its substantially flush connecting appliance or socket.

Fig. 3 is a rear view in elevation of the suction cleaning nozzle.

Fig. 4 is a similar view of the hose-connector.

Figs. 5, 6 and 7, respectively, are plan views of the members forming the connecting appliance.

Fig. 8 is a fragment in vertical section, showing the connecting appliance with the suction nozzle terminal in position for use, and Fig. 9 is an outline view in elevation of the complete vacuum cleaning device.

Throughout the several figures of the drawings, I have employed the same character of reference to indicate similar parts.

The fan casing $a$, and its blower outlet $a'$, preferably comprise a hollow aluminum casting which is supported upon the wheels $b$. The suction cleaning nozzle $c$, and the hose-connector $d$, are adapted to fit alternatively thereon. These members are separable, but are readily attachable to the casing, as indicated by the said relative positions in Figs. 1 and 9.

The suction cleaning nozzle $c$, has a mutilated rearward flange member or members $c'$, and a rear sleeve $c''$, which are adapted to fit closely upon and within the casing, as will be explained. The hose-connector $d$, likewise has a mutilated flange member or members $d'$ for accomplishing the same purpose; said hose-connector in addition, being of such inner diameter, that it will fit closely over the blower outlet $a'$ of the vacuum cleaning apparatus. The assembled relation of the parts is shown in Fig. 9.

The extremely simple connecting appliance for alternatively attaching the vacuum cleaning nozzle or the hose-connector, will be readily understood by making reference to Figs. 5, 6 and 7, showing the members which are secured about the inlet opening $a''$ of the fan chamber $a$. These are essentially annular in form, and their openings are slightly larger than said inlet opening, but of such diameter that the suction cleaning nozzle will fit easily therein, while its extension $c''$, fits closely within said opening to form substantially a seal for said nozzle, when it is in position for use. This is well shown in the enlarged section.

The inner annulus $e$, is cut-away throughout arcs of approximately 30°, positioned 120° apart to form sockets or receptacles $e'$ for the mutilated flange members $c'$, $d'$, respectively, upon the nozzle and hose-connector. The annulus $f$, is similarly constructed, although slightly wider cut-away portions $f'$ and corresponding slots $f''$ are provided therein, while a protruding thumb piece $f^3$, for its actuation, is integral with the body of said member. A heavier reinforcing or cover member $g$, completes the said flush-connecting appliance, while the corresponding cut-away arcs $g'$ and screw-holes $g''$, together with an outer flange $g^3$ will be found therein. The cover member, I may say, while desirable, is not absolutely essential to the construction shown.

This flush connection, as best seen in Fig. 1, permits a flat front plate for the fan chamber to be used, offering no projections to interfere when storing, packing or shipping the suction cleaner. Moreover, the suction nozzle may be properly shaped and proportioned to avoid eddy-currents therein, which materially increases its effectiveness, while enabling one to attach and detach it almost instantaneously without tools.

As mounted upon the casing *a*, the connecting appliance affords a socket, wherein the rear of the suction cleaning nozzle, with its mutilated flange members or extensions is adapted to fit; said flange members being of slightly greater thickness than the annulus *e*, and fitting accurately within the sockets *e'*, afforded therein, while the former closely fits rearwardly within the inlet opening *a''* of the fan chamber.

Upon rotating the member *f*, by means of its thumb piece in a clockwise direction, after the nozzle has been thus inserted in position, it is seen that the corners $f^4$ thereof, which preferably are slightly flared, will ride above the flange members *c'* and serve to wedge them well within their sockets *e'*, to the end that a sealing or tight fitting attachment may be provided for the vacuum cleaning nozzle. The reverse movement of the thumb piece $f^3$ instantly frees said nozzle and the hose-connector *d* may be substituted therefor.

Accordingly, the device may be assembled and disassembled without the use of tools, while the wedging action of the rotatable member *f* is sufficient to compensate for any slight wear between the parts. Also, the attaching screws *h*, may be set a little more tightly in the casing *a*, to take up further wear. Thus the device is adapted for the use of house-wives or servants and requires no tools or mechanical adaptability for the instant attachment and detachment of the different connecting members.

An important incident of my improved flush connection for the nozzle or other implements of a suction-cleaner is found in the immediate adjustment thereof in their proper predetermined position with respect to the casing and contained fan, in which they are held rigidly against angular movement or turning. The position likewise is established as between the nozzle and the floor on which it operates, so that the spacing is uniform along the entire slot of the nozzle. Moreover, the efficiency of the fan suffers no impairment, by reason of the fact that the floor nozzle, which is the implement principally used, is coupled directly to the fan chamber and its duct may be properly proportioned to direct the air currents therein, without the disadvantage attendant upon an extended tubular connection or an intermediate or expansion chamber.

Having now described the preferred embodiment of my invention, I claim as new, and desire to secure by Letters Patent, the following:—

1. A suction cleaning appliance of the class described, having a substantially flat front face centrally open to the fan and a removable suction nozzle, of a flush connecting mechanism provided upon the front face adjacent to the opening and adapted separably to secure the nozzle in position, substantially as set forth.

2. In suction-cleaning apparatus, the combination with a fan-chamber and fan, of an alternative implement adapted for connection either with the inlet or the blower openings thereof and equipped with a mutilated flange, and a connecting-appliance for the inlet-opening, comprising a female mutilated disk wherein said flange fits closely and a superposed rotatable disk equipped with wedging members adapted to be brought into partial register with the mutilated flange, substantially as set forth.

3. In suction-cleaning apparatus, the combination with the fan-chamber and its enclosed fan, of a connecting appliance substantially flush with the inlet opening of said fan-chamber; comprising a flat recessed socket and a superposed rotatable member equipped with wedging parts adapted to register above said recesses, and a removable implement having extensions adapted closely to fit within the recesses of the socket, substantially as set forth.

4. In suction-cleaning apparatus, the combination with the fan-chamber and its enclosed fan, of a connecting appliance substantially flush with the inlet opening of said fan-chamber; comprising a flat recessed socket and a superposed rotatable member equipped with wedging parts adapted to register above said recesses and a superposed reinforcing cover-member, and a removable implement, having extensions adapted closely to fit within the recesses of the socket, substantially as set forth.

5. A suction cleaning appliance of the class described having a fan casing substantially flat in front with a central inlet opening and a separable cleaning nozzle, of a flush connecting mechanism therefor between the casing and the nozzle having interlocking members adapted accurately to position and secure the separable nozzle upon the fan casing in register with the inlet opening, substantially as set forth.

6. A suction cleaning appliance of the class described, having a removable cleaning nozzle and an alternatively attachable implement or connection for its lower outlet, of a flush connecting mechanism associated therewith between the casing and the nozzle and adapted removably to secure the nozzle or the connection in register with the in-

let opening of the appliance, substantially as set forth.

7. Coupling means for suction-cleaning implements, comprising a casing having an inlet opening and a receiving seat with substantially flush detents in fixed position upon its front wall, a suction-cleaning implement having corresponding flush detents and adapted to fit said receiving seat in predetermined position with respect to the casing, and a wedging member adapted removably to secure the implement in position, substantially as set forth.

8. Suction-cleaning apparatus, comprising a casing having an inlet opening and a recessed seat with peripheral recesses, a suction-cleaning floor implement having peripheral flange members corresponding to said recesses and adapted to fit upon the recessed seat in substantially flush relation and in predetermined position with respect to the casing, and a rotatable wedging member adapted to engage said flange members and form a flush coupling, substantially as set forth.

9. Suction-cleaning apparatus, comprising a suction-fan casing having an inlet opening equipped with a stationary plate recessed in fixed position, a suction-cleaning nozzle having a multilated flange closely fitting said opening and recess, in substantially flush relation and thereby adapting said nozzle to be adjusted upon the casing in fixed position, and a rotatable sheet metal wedging member adapted to engage the multilated flange and secure the nozzle in place upon the casing, substantially as set forth.

10. The combination with the casing of a suction-cleaning fan; said casing having a front inlet opening and a receiving seat with peripheral engaging members, substantially flush flange members fitting the same, a floor nozzle carried thereon and adapted to be connected in predetermined position thereby, and a wedging member removably securing the same to the receiving seat, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK E. ROBERTSON.

Witnesses:
FRANK BUBUA,
ALBERT LYNN LAWRENCE.