

Sept. 9, 1924.

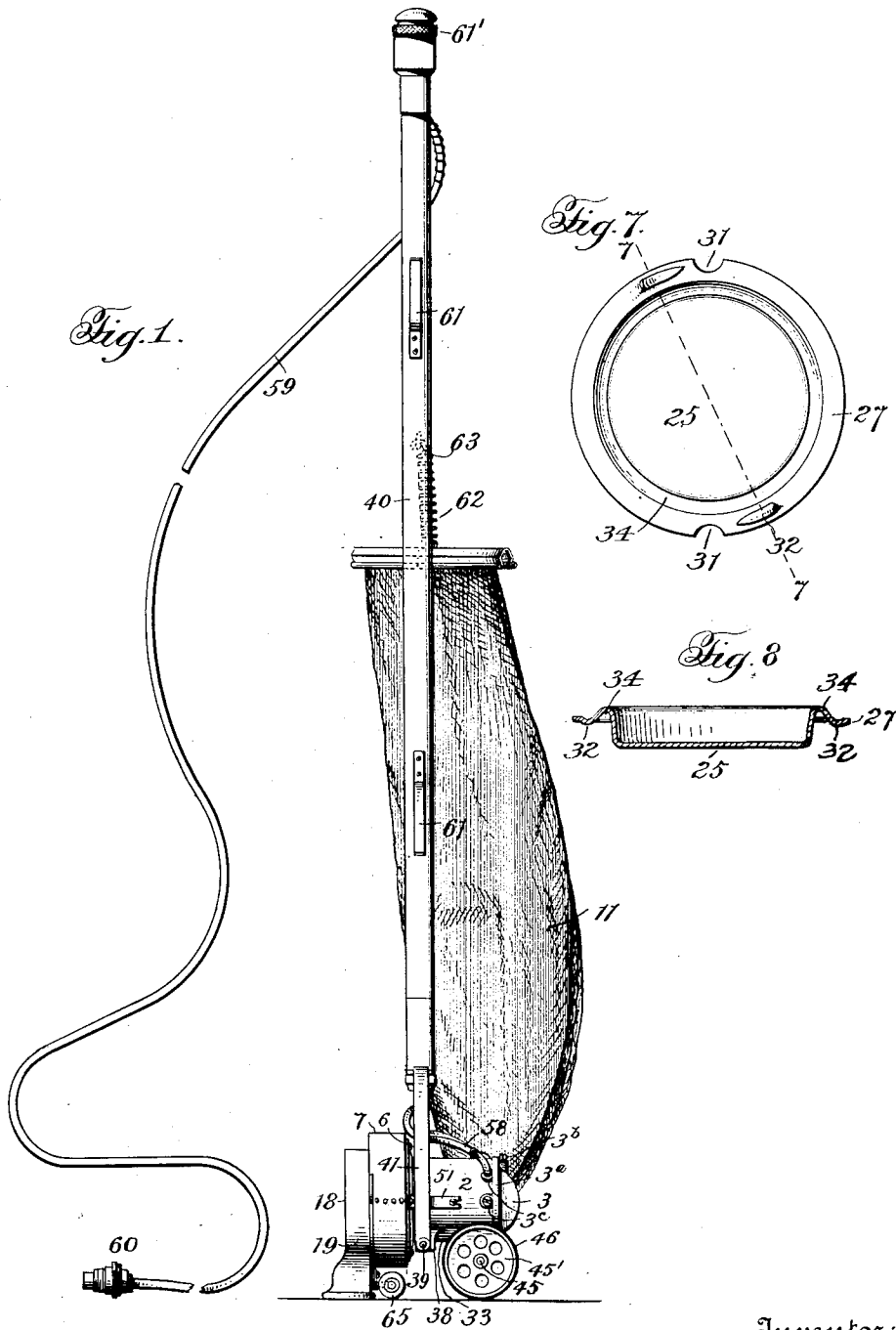
1,507,878

M. S. WRIGHT

VACUUM CLEANING MACHINE

Filed Sept. 21, 1916

4 Sheets-Sheet 1



Witness:
Jas. E. Hutchinson:

By

Inventor:

Morris S. Wright,
Attorney:

Sept. 9 , 1924.

1,507,878

M. S. WRIGHT
VACUUM CLEANING MACHINE

Filed Sept. 21 , 1916 4 Sheets-Sheet 2

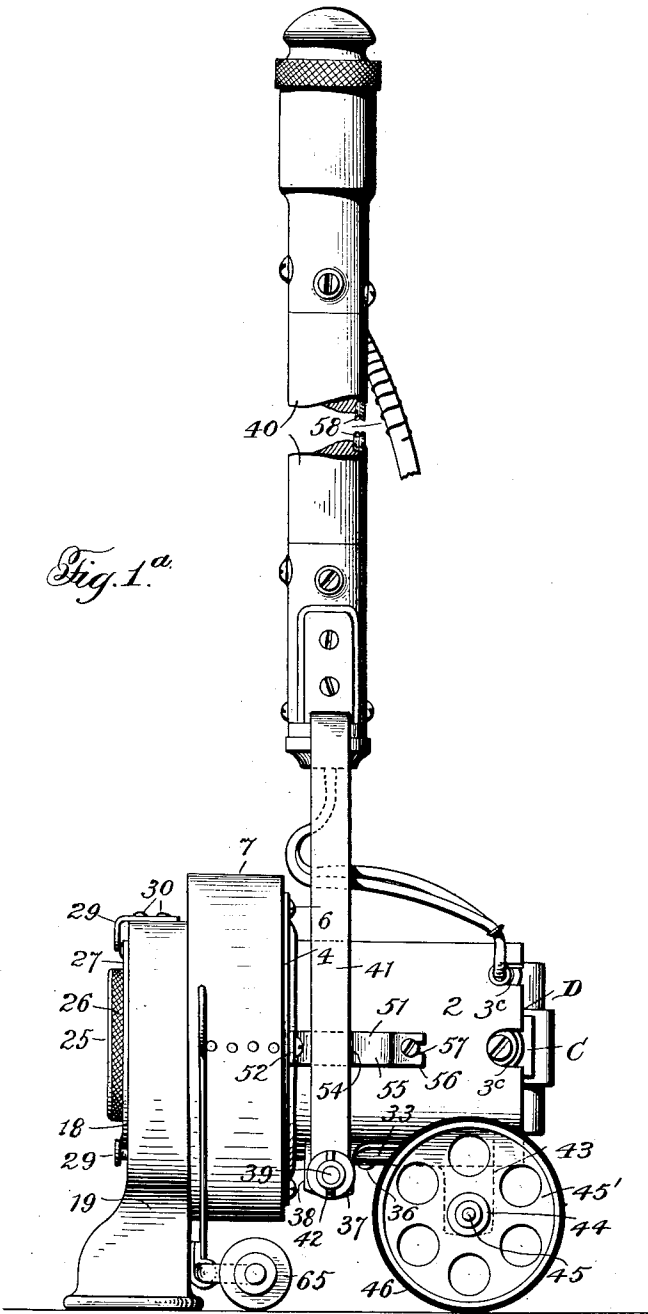


Fig. 1. a.

Witness:
Jas E Hutchinson

By

Inventor:
Morris S. Wright,
Raymond Attorneys:

Sept. 9, 1924.

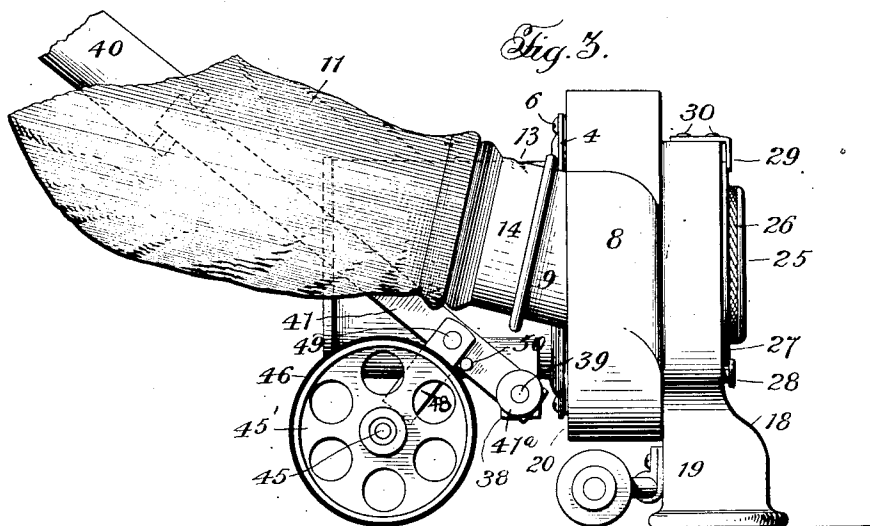
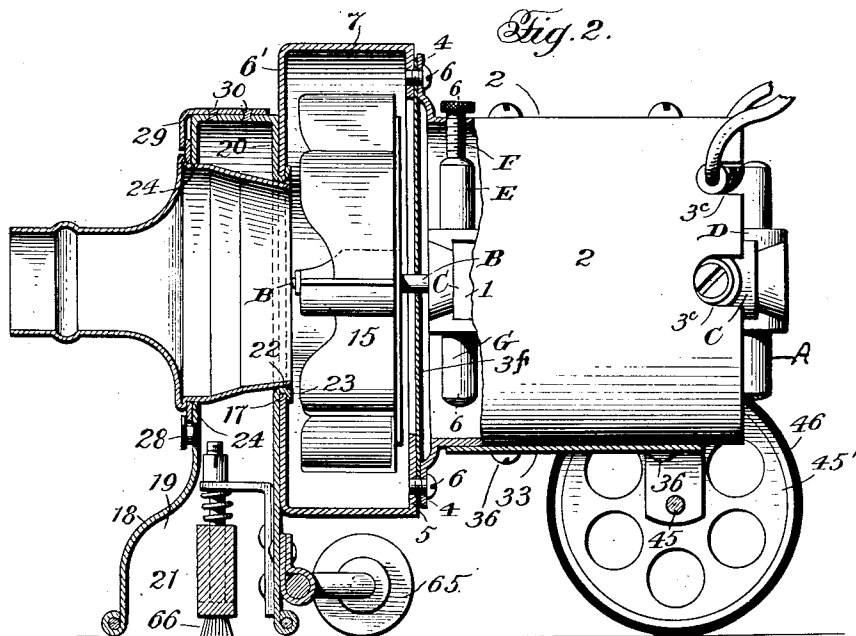
1,507,878

M. S. WRIGHT

VACUUM CLEANING MACHINE

Filed Sept. 21, 1916

4 Sheets-Sheet 3



Inventor:

Witness:
Jas. E. Hutchinson:

334

Morris S. Wright,
By *Quinn & Milnes*, Attorneys.

Sept. 9, 1924.

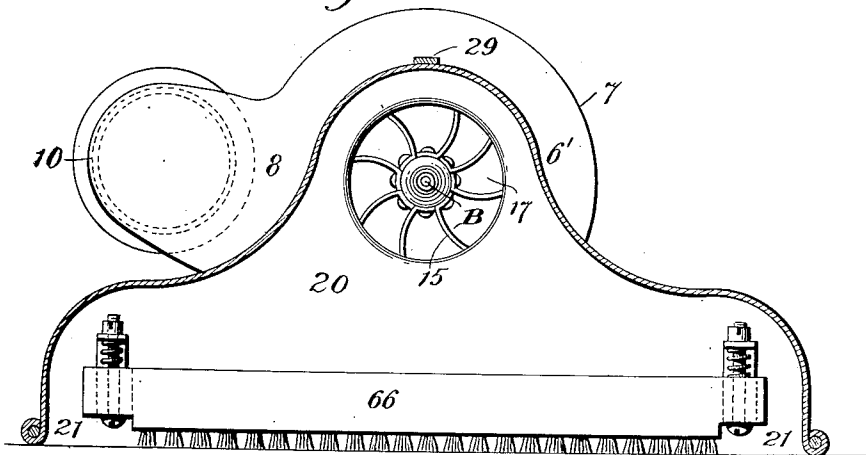
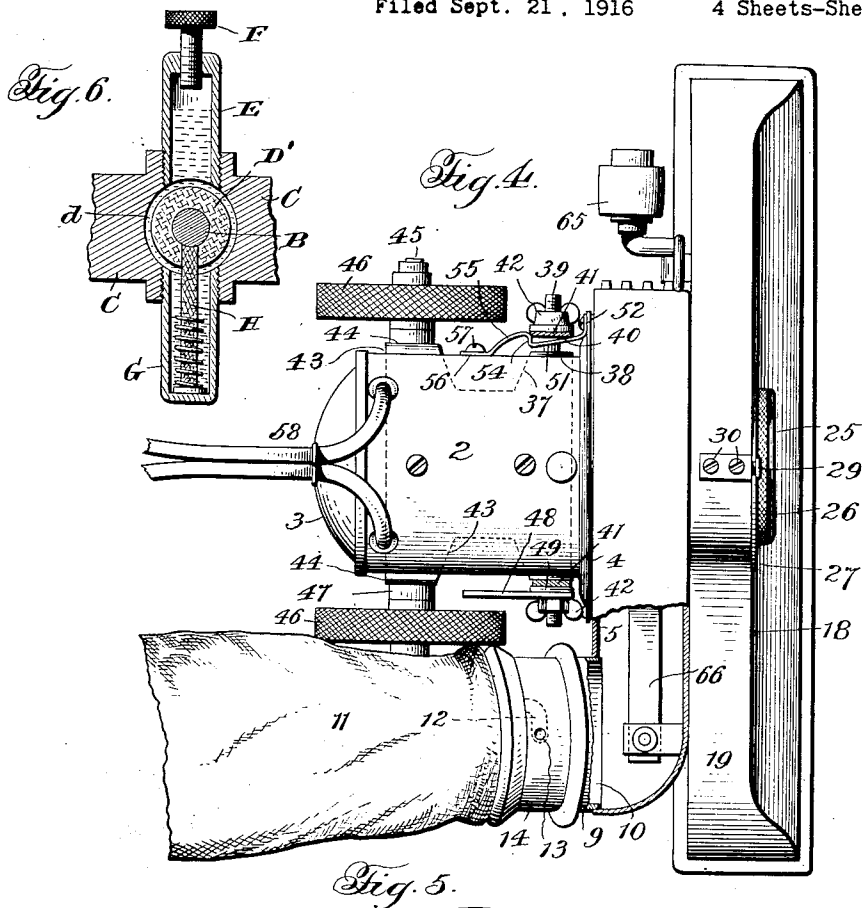
1,507,878

M. S. WRIGHT

VACUUM CLEANING MACHINE

Filed Sept. 21, 1916

4 Sheets-Sheet 4



Inventor:

Witness:
Jas. Hutchinson:

By

Morris S. Wright,
Racine, Wis., Attorneys.

UNITED STATES PATENT OFFICE.

MORRIS S. WRIGHT, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO M. S. WRIGHT COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

VACUUM CLEANING MACHINE.

Application filed September 21, 1916. Serial No. 121,478.

To all whom it may concern:

Be it known that MORRIS S. WRIGHT, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, has invented certain new and useful Improvements in Vacuum Cleaning Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to vacuum cleaning machines of the portable type adapted to be moved over floors, stairs or other surfaces for cleaning and renovating purposes.

It is one of the objects of the invention to provide an improved machine of the character stated, exceedingly compact in design and construction whereby the same may successfully operate under low down articles of furniture and at the same time to provide a machine of this type sufficiently light to be readily moved from place to place in operation, with a minimum expenditure of labor or effort on the part of the operator.

One of the primary objects of the present invention is to provide in operative association with the suction creating means a motor barrel or casing, to the end that access to the motor may be obtained at will, and the motor may be removed as a complete unit from the casing provided therefor, without dismantling its main parts.

The invention includes a novel and improved construction and arrangement of fan casing and nozzle, said parts being preferably formed of sheet metal and novel means of connection between the parts being provided whereby they constitute in effect a single unit.

The invention also includes a novel and improved supporting means or platform for the motor and associated parts.

Another feature of the invention includes a push handle for the machine with novel and improved means of attachment therefor, and associated means for retaining the handle in relatively fixed position when the machine is not in use.

A still further object of the invention is to provide novel electrical connections operatively associated with the handle and motor.

Certain features herein illustrated and described, and not claimed, constitute the subject matter of claims in my copending application for Letters Patent, Serial No.

193,209, filed September 25, 1917, for electric vacuum cleaning machines.

More particularly, the invention includes an electrical vacuum cleaner machine of generally improved construction, neat, simple and comparatively inexpensive in design and construction, of increased efficiency and highly satisfactory for the purposes intended.

Other improvements and novel details in the construction and arrangement of the various members will be appreciated from the description to follow which for a clear understanding of the invention is to be considered in connection with the accompanying drawings which form a part hereof and wherein is disclosed a convenient and satisfactory embodiment of the invention for the purpose of illustration.

In the drawings:—

Fig. 1 is an elevation of the complete apparatus; Fig. 1^a is a similar view on an enlarged scale with parts broken away; Fig. 2 is a detail elevation with parts shown in section of the device, the operating handle being omitted; Fig. 3 a similar view looking from the opposite side of the device; Fig. 4 a plan view of Fig. 3; Fig. 5 a detail sectional view of the nozzle, the fan casing being shown in elevation;

Fig. 6 is a detail sectional view enlarged of a lubricating means for the motor.

Fig. 7 is a front elevation enlarged of a closure cap for the nozzle opening 24.

Fig. 8 is a sectional view substantially on the line 7—7 of Fig. 7.

With more particular reference to the drawings wherein like reference numerals refer to corresponding parts throughout the several views, 1 is a horizontally disposed motor and 2 a cylindrical or tubular casing surrounding the same, said casing being open at its forward end and having a closure cap 3 at the rear end thereof. An outwardly projecting annular flange 4 is provided at the forward end of the casing 2, the same being adapted to abut against the rear wall 5 of a fan casing of somewhat greater diameter than that of the motor casing 2. The flange 4 is secured to said rear wall of the fan casing as by removable screws 6.

The motor is generally indicated by the reference character "A" and is preferably of such construction that the shaft "B" thereof is supported in suitable bearing

brackets "C" connected to the ends of the fields "D". By reason of the construction just described, the motor may be readily slid into place within the tubular casing 2 and the casing forming only indirectly a bearing for the motor said casing may be inexpensively formed of sheet metal. The shaft "B" terminates short of the rear cap 3 and projects forwardly of the front end of the casing passing loosely through a metallic disc washer 3', it being observed that the opening in the washer 3' is of such diameter that the same is relieved of frictional contact with the shaft "B", the brackets "C" as previously noted constituting the bearings for said shaft. The disk washer 3' closes the motor casing 2 against the entrance of dust, the washer being removable and held in place conveniently by the same securing means 6 which connects the motor and fan casings together. The body portion of the fan casing is preferably formed from sheet metal and having a front wall 6', and an annular side wall 7, the latter being secured as by welding to the rear wall 5. The fan casing has a laterally extending drawn part 8 and connected to said part 8 is a rearwardly disposed annular collar 9 surrounding an outlet opening 10 whereby to discharge the dust and dirt through said opening 10 into a suitable dust receptacle 11 having a detachable connection at the open end of the latter with said collar 9. This connection preferably includes bayonet slots 12 on the flange 10 adapted to be engaged by lugs 13 on a collar 14 at the lower end of the dust bag or receptacle 11. A fan 15 is mounted upon the shaft "B" of the motor 1 whereby to be driven by the latter and draw in the dust through the opening 17 in the front wall 6' of the fan casing.

The closure cap 3 is preferably cup-shaped whereby to overlies portions of the motor projecting beyond the body part of the motor casing, said cap having an annular flange 3^a engaging over the end of said body part and detachably secured thereto as by removable bolts 3^b. By reason of this construction, it is only necessary to remove the cap to obtain access to the motor for adjustment and repair purposes. Likewise the motor may be bodily removed from its casing the casing having cutout parts 3^c at its end permitting removal of the motor from the casing without disconnecting the electrical connections.

A convenient means of lubricating the shaft "B" includes a circumferential groove d in suitable bushings "D" in the bracket "C" an inlet oil cup "E" connecting with said groove at the top and normally closed by a removable cap "F" accessible through an opening in the casing 2. Connecting with said groove d is an oil receptacle "G",

in which is positioned a spring held wick as of felt "H" projecting through an opening in the bushings and constantly bearing against the shaft "B" whereby to continuously lubricate the shaft at its bearing.

The nozzle is preferably formed of sheet metal comprising a front wall 18, an integral edge wall 19 and a rear wall 20, the latter being secured to the edge wall 19 as by welding or the like. The parts 18 and 19 are stamped or drawn to the desired shape, and the walls 18 and 20 at the lower edge thereof are separated from one another by an unobstructed space affording a dust inlet opening 21. The rear wall 20 of the nozzle is adapted to abut against the front surface 6' of the fan casing and has an opening 22 affording communication between the nozzle chamber and the interior of the fan casing. The wall 20 surrounding the opening 22 is struck up to form an annular flange adapted to engage over the walls surrounding the openings 17 in the front wall 6' of the fan casing, and bent into contact with the rear surface of said wall 6 of the fan casing as illustrated at 23. This means of connection between the nozzle and fan casing is important in that an air tight engagement is provided without the necessity of drilling the parts for the reception of bolts or the like, which latter are also apt to become loose or lost. Again, the flange 23 affords a continuous smooth surface over which the dust laden particles may readily pass, and without any tendency to accumulate at this point as is the case where other types of connection are provided.

It is desirable at times to cleanse wall surfaces and the like, and with this in view, it is contemplated to provide an opening 24 in the front wall of the nozzle of a diameter preferably slightly greater than that of the opening 17 in the fan casing, a suitable metallic hose attachment being adapted to be applied through the opening 24 and to engage the wall surrounding the opening 17 of the fan casing whereby to provide direct communication between the suction creating medium and the hose and at the same time to cut off communication between the nozzle inlet 21 and the fan casing. It is unnecessary to describe herein in detail the hose coupling mechanism which adapts the device for use in the cleansing of walls in that this feature is made the basis of a separate application for Letters-Patent filed concurrently herewith. A suitable closure for the opening 24 takes the form of a metallic cap 25 having a roughened periphery 26 whereby to be grasped by the fingers of the operator, and an annular flange 27 being provided at the base thereof to contact with the wall 18 of the nozzle. The securing means for the closure cap 25 preferably

includes a headed bolt 28 and a sheet metal yieldable clip 29, the latter having a rearward extension secured as by rivets 30 to the top edge of the nozzle. The head of the bolt 28 and the spring clip formed by the yieldable metallic member 29 are spaced from the front surface 18 of the nozzle whereby to receive therebeneath the flange 27 of the closure cap 25. The retaining members 28 and 29 are preferably oppositely disposed, and the annular flange 27 on the closure cap is provided with oppositely disposed segmental cut-out parts 31 for the reception of the members 28 and 29 in the positioning of the cap. The flange 29 is provided with a struck up peripheral cam projection 32 at one side of each cut-out part 31 whereby as the cap is given a rotatable movement, the cam surfaces are brought into engagement with the undersurface of the retaining members 28 and 29 thereby forcing the cap into air tight contact with the wall 18 of the nozzle. The closure cap 25 is also provided with an annular projection 34 on the rear surface thereof to fit into the opening 24 and engage the wall surrounding said opening in the nozzle. The projection 34 serves as a guide or centering medium in the rotatable movement of the cap to clamp or release the same.

A suitable supporting base or platform for the rear end of the machine is provided, the same comprising a sheet metal body part 33 curved substantially from end to end whereby to conform to the periphery of the motor casing 2 at the base thereof, said body part being secured in place as by bolts 36. Arranged adjacent the forward end of the platform 33 are integral lateral extensions bent outwardly at 37 and thence downwardly at 38, said downward extensions being apertured and adapted to receive suitable shaft bearings 39 for the reception of the lower end of a push handle 40. The bearings 39 preferably take the form of screw threaded bolts, the heads of which are arranged to engage the inner surface of the lugs formed by the downward extensions 38. The push handle 40 is provided at its lower end with a U-shaped or bifurcated bracket, the opposite arms 41 of which have apertures in which are loosely positioned collars or bushings 41^a adapted to loosely engage over the bolts 39, and suitable washers being interposed between the arms 41 and the lugs 38. The engagement between the arms 41 and the bolts is a loose one whereby to provide a pivotal support for the lower end of the handle. Suitable thumb nuts 42 engaging the threaded terminals of the bearings 39 serve to retain the handle in position on the bearings, and by adjusting said nuts 42 any unnecessary play may be taken care of, while at all times the bushings 41^a permit free swinging move-

ment of the handle. The platform 33 adjacent the rear end is provided with additional lateral extensions 43 at opposite sides, the same terminating in downward projections or lugs 44 of a length somewhat greater than the lugs 38 previously described, the lugs 44 being apertured for the reception of a shaft 45 which shaft projects beyond the outer sides of the lugs 44 and is adapted for the reception of supporting wheels preferably of metallic construction 45' and having yieldable treads 46. A suitable washer or lug 47 is interposed between the outer surfaces of the lugs 44 and the hubs of the wheels 45, one of which said bearings in addition to constituting a spacing medium for the wheels, also constitutes an abutment member for limiting the downward swinging movement of the handle 40, one of the arms 41 of the handle being provided with a stop member 48 for this purpose. Said stop member is pivoted at 49 whereby to swing from a position substantially parallel with the longitudinal axis of the arm 41 to a position substantially at right angles thereto, the swinging movement being limited by a stop 50 on said arm 41. When in engagement with the stop 50, the stop member 48 will be in position to contact with the abutment or bearing 47 on the shaft 43 thereby limiting the downward swinging movement of the handle with the result that the machine may be tilted to elevate the nozzle from the surface.

When the machine is not in use, it is desirable to fix the handle in stationary position, and with this in view, suitable releasable retaining means for the handle is provided substantially as follows:—

A spring arm 51 is provided having an angled extension 52 secured in place to the flange 4 of the casing 1 as by one of the retaining screws 6 which secure said casing to the fan casing. The member 51 has a shouldered part 54 connecting with a curved portion 55 which latter terminates in a slotted part 56 engaging under a headed pin or bolt 57 secured to the casing 2. The parts 51, 54 and 55 are spaced from the periphery of the casing 2 whereby the same may readily yield when inward pressure is applied thereto. The shoulder part 54 is spaced from the end 52 a distance slightly greater than the width of the arms 41 of the handle, whereby the shoulder 54 cooperates with the part 52 and the flange 4 of the casing 2 to form a pocket or recess engaging over opposite edges of the adjacent arm 41 to retain the latter in fixed upright position. The curved portion 55 of the retaining clip allows the arm 41 of the push handle to readily ride over the same and spring into place to the rear of the abutment 54, and at the same time because of the yieldability of the retaining clip just de-

scribed, the handle may be forced rearwardly over the abutment 54 when the handle will be free for swinging movement about the pivotal supports 39.

It will be understood that suitable electrical connections are provided for the motor, the said connections being generally indicated by the reference numeral 58. These connections are adapted to have electrical connection with the conduit extending longitudinally of the handle part 40, suitable wiring 59 being provided for connection with an ordinary electric socket through the medium of the plug 60. The handle is provided with suitable supports 61 for the reception of said wiring when the machine is not in use. Also, the handle is provided with a suitable controlling key 61' at the outer terminal thereof. The dust receptacle at the discharge end thereof is adapted to be yieldably supported on the handle through the medium of a spring coupling member 62 having an eye adapted to detachably engage over a hook 63 on said handle. While in some operations the nozzle constitutes the only support for the front end of the machine, the nozzle being in direct contact with the surface, adjustably supported rollers 65 may be provided for raising said nozzle from the surface as desired, and likewise said nozzle may be provided with a spring held brush 66.

The operation will be obvious to those skilled in the art. When the device is not in use, the handle will be in locked engagement in the retaining clip 51 when by exerting rearward pressure thereon the handle will be released for free swinging movement and the machine will have backward and forward movement imparted thereto by said handle. Assuming it is desired to operate over rugs or uneven surfaces the stop member 41 on the handle is moved outwardly or into position to engage the abutment bearing 47 on the wheel shaft 43 when the nozzle may be elevated to permit the machine to ride over the edge of the rug or the like. When operating under low down furniture, the stop member 48 may be moved into a position parallel with the arms 41 when the handle may be lowered to a point within the horizontal plane of the machine whereby to offer no obstruction thereabove. The dust laden air will readily pass through the nozzle through the medium of the motor driven fan and find an escape through the exhaust conduit 8 into the dust receptacle 11, which latter may be removed as described to be emptied.

What I claim is:—

1. In a vacuum cleaning machine, the combination of a horizontally disposed substantially cylindrical casing, a motor therein, a nozzle, a fan operated by the motor and in communication with the nozzle

chamber, a platform for the casing arranged to conform to the periphery thereof, and having downwardly projecting forward side lugs and rearward side lugs, wheel supports for the rear end of the machine supported from said rear side lugs, and a push handle having movable connection with the forward side lugs of the platform at a point between the fan and wheel supports.

2. In a vacuum cleaning machine having a dust inlet nozzle, motor, and an interposed suction means driven by the motor, in combination with a substantially cylindrical casing for the motor, a platform for the casing of integral construction and comprising a body part curved to conform to the lower peripheral portion of the casing and having downwardly extending lugs adjacent the rear end thereof and also having downwardly extending lugs adjacent the front thereof, supporting wheels for the machine having bearings in said rear lugs, and a push handle having a bifurcated lower end the arms of which overlie the sides of the motor casing and are pivotally connected to said front lugs.

3. In a vacuum cleaning machine having a dust inlet nozzle, motor, and an interposed suction means driven by the motor, in combination with a substantially cylindrical casing for the motor, a sheet metal platform for the casing having a longitudinally curved body portion constituting a rest for the casing and secured thereto and also having downwardly bent lugs at its sides adjacent the front and rear end thereof, a push handle having a bifurcated end movably connected to the forward lugs, and wheels supported from the rear lugs adapted to engage the surface.

4. In a vacuum cleaning machine having a dust inlet nozzle, motor, and an interposed suction means driven by the motor, in combination with a substantially cylindrical casing for the motor, a sheet metal platform for the casing having a longitudinally curved body portion constituting a rest for the casing and secured thereto and also having downwardly bent lugs at its sides adjacent the front and rear ends thereof, a push handle having a bifurcated end movably connected to the forward lugs, wheels supported from the rear lugs adapted to engage the surface, and means for spacing the wheels laterally from said lugs whereby the bifurcated parts of the handle may move to a position between the rear lugs and said wheels.

5. In a portable vacuum cleaning machine having the usual dust-intake and vacuum-creating means, the combination of a motor for the vacuum-creating means, a casing for said motor, said casing having an open rear end, and a removable cap for said rear

end permitting access to said motor without disturbing the dust-intake, the motor being so constructed and mounted within the casing that the same may be bodily removed without dismantling any of its parts through said open rear end of the casing.

6. In a portable vacuum cleaning machine having the usual nozzle, vacuum-creating means and casing for the latter, the combination of a motor-casing mounted upon the first-mentioned casing, a motor within said motor-casing operatively connected with said vacuum-creating means, said motor-casing having a removable rear end whereby to permit of access to said motor, and said motor being so constructed and arranged within said casing whereby the same may be bodily removed at will without dismantling its parts through the end opening of its casing.

7. In a vacuum cleaning machine, the combination of a tubular motor casing, a motor positioned within and bodily removable from the said casing and having a driving shaft projecting from the opposite ends thereof, bushings for said shaft adjacent opposite ends thereof, said bushings having a circumferential groove, and an opening therethrough adjacent the base thereof, an oil conduit connecting with said groove adjacent the top thereof, an oil receptacle communicating with the base of said groove, and a spring-held oil feed device positioned in said opening to the bushings and communicating with said oil receptacle, the oil feed conduits being accessible through the motor casing.

8. In a vacuum cleaning machine, the combination of an elongated tubular motor casing, a nozzle, a fan casing interposed between the nozzle and motor casing and directly connected to both, a fan in the fan casing, a motor in the motor casing for driving the fan, said motor casing having a removable rear end wall, and means whereby the motor may be bodily removed from said tubular casing through said end wall, and without dismantling the nozzle and fan casing.

9. In a device of the character described, the combination of a casing adapted to be moved along a working surface and having an electric motor therein, an operating handle terminating in a fork whose arms embrace and detachably engage said casing whereby the casing may be moved about the working surface, said handle having a longitudinal aperture at its lower end between the fork arms, and a separable plug connection having one of its parts located in the apertured end of said handle and having the other part connected to said motor by a flexible conductor.

10. In a vacuum cleaning apparatus, the

combination of a motor, a support therefor, an operating handle terminating in a fork whose arms embrace and movably connect with said support whereby the same may be moved back and forth, said handle having a longitudinal aperture at its lower end between the fork arms, and a separable plug connection projecting through the apertured end of the handle, and connecting with a conduit projecting from the motor, and a controlling key for the motor mounted upon said handle.

11. In a vacuum cleaning machine, the combination of a fan casing, a fan therein, a nozzle in operative association with the fan casing, a motor for operating the fan, and means for supporting the motor on the fan casing whereby the motor may be removed as a complete unit at will, without removing said supporting means, comprising a tubular casing having means at its inner end for engaging the fan casing and having an opening at its outer end of a size to permit insertion and removal of the motor, and means for normally closing said outer end of the casing.

12. In a vacuum cleaning machine, the combination of a fan casing, a fan therein, a horizontally disposed motor operatively connected with the fan, means for supporting the front end of the machine including a nozzle in communication with the fan chamber, and means for supporting the rear end of the machine, comprising a platform underlying the motor and having depending therefrom adjacent opposite ends integral lugs, wheels supported from the rear side lugs of the platform, and a handle having a bifurcated lower end the arms of which are adapted to overlie the motor and engage respectively the forward side lugs of the platform, the said platform being constructed and arranged whereby the engagement between the handle and platform will be at a point rearwardly of the fan casing and forwardly of said supporting wheels.

13. In a portable vacuum cleaning apparatus having a nozzle and vacuum-creating means, the combination of a casing for the vacuum-creating means, a motor casing secured to the first-mentioned casing and having an opening at its outer end and an opening in its side wall communicating with the end opening for the reception of an electric connection, a removable closure for said open end of the motor casing, and a motor positioned in the motor casing for imparting movement to the vacuum-creating means, the motor with its parts and electrical connections being insertible and removable as a whole from the casing upon the removal of said closure.

14. A motor attachment for vacuum cleaning apparatus having the usual dust

inlet nozzle and vacuum-creating means such as a fan, and a casing for the fan, said attachment comprising a cylindrical casing having means for connecting the
5 same with the fan casing, said cylindrical casing having an opening at its rear end, a removable closure wall for said opening, a motor loosely positioned within said casing, a shaft for driving the fan mounted in
10 bearings connected to the field of the motor, the said motor being freely mounted as a unit in said casing, and said motor with its

electrical connections and shaft being bodily removable through the end opening of the cylindrical casing upon the removal of the
15 closure wall while the parts are maintained in connected or assembled condition.

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

MORRIS S. WRIGHT.

Witnesses:

MABEL O. CHADBOURNE,
CLIFFORD L. WRIGHT.