May 5, 1936. N. H. WATTS 2,039,861

VACUUM CLEANER

Filed Oct. 18, 1933

Fig. 1.

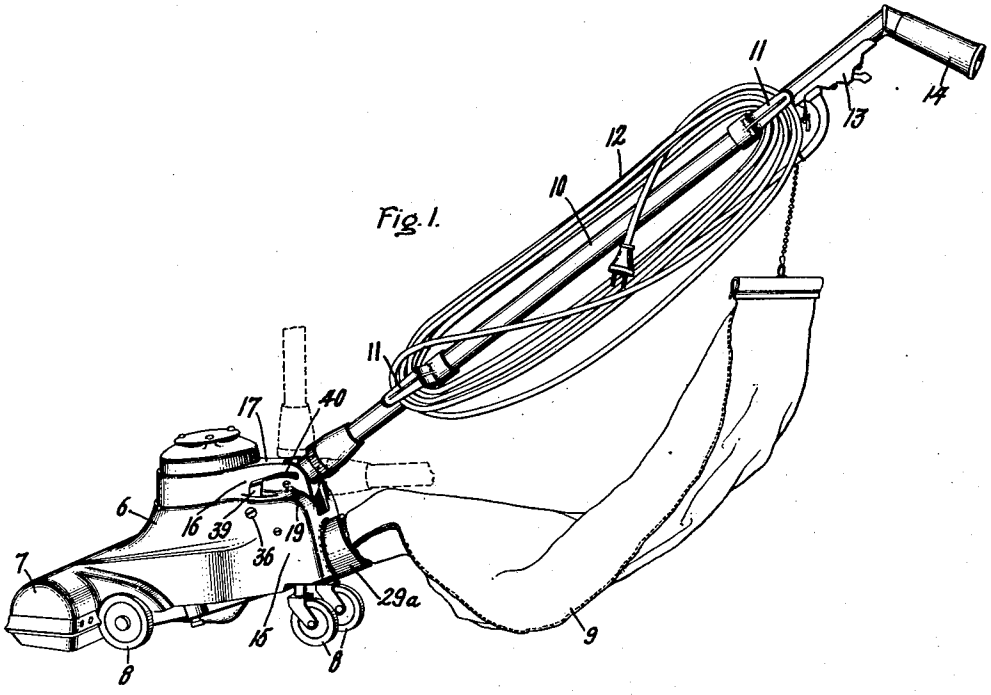



Fig. 2.

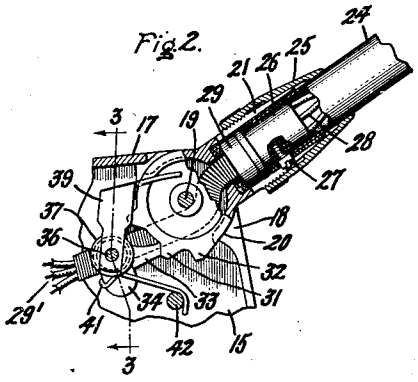



Fig. 3.

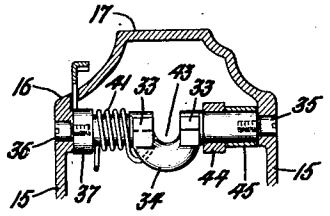



Fig. 4.

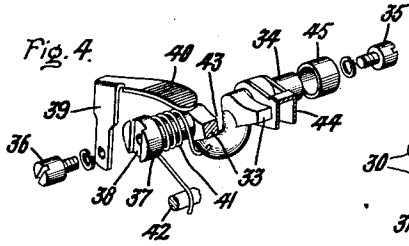
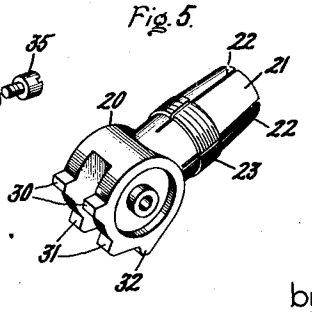



Fig. 5.




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Patented May 5, 1936 2,039,861

# UNITED STATES PATENT OFFICE

2,039,861

## VACUUM CLEANER

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Application October 18, 1933, Serial No. 694,093

3 Claims. (Cl. 15—16)

The present invention relates to electric vacuum cleaners of the portable household type.

One object of the invention is to provide an improved construction and arrangement of handle attaching and locking means whereby the handle may be locked in an upright position, held in an angular position to permit the handle to be used for tilting the cleaner on its rear wheels, and lowered to a predetermined low position.

Another object of the invention is to provide an improved construction and arrangement for pivoting a handle to a vacuum cleaner casing.

Other objects of the invention and the advantages thereof are pointed out in the following specification.

In the drawing, Fig. 1 is a perspective view of an electric vacuum cleaner embodying the invention, the handle being shown in full lines in one position and indicated in dotted lines in two of its other positions; Fig. 2 is a detailed sectional view of the handle pivoting and locking construction; Fig. 3 is a detailed sectional view taken on line 3—3, Fig. 2, looking in the direction of the arrows; Fig. 4 is an exploded view of a part of the locking construction, and Fig. 5 is a perspective view of the pivot head on the handle.

Referring to the drawing, 6 indicates the casing of an electric vacuum cleaner, 7 indicates the suction nozzle, 8 indicates the front and rear supporting wheels, 9 indicates the dust bag, and 10 indicates the pivoted handle used in pushing the cleaner over the surface to be cleaned.

The handle is provided with cord hooks 11 on which electric cord 12 may be wound, and at its upper end with an electric control switch 13 and a grip 14. The construction so far described is to be taken as typical of any suitable electric vacuum cleaner.

The present invention relates particularly to the construction and arrangement for pivoting the handle on the cleaner casing and to the locking means and stop means for the handle. In this connection it is desirable to provide a means for locking the handle in vertical position so that the cleaner may be lifted as a unit; an intermediate stop means for the handle whereby when it is lowered a predetermined amount, the handle is held from further downward movement relative to the cleaner casing so that by pushing down on the handle the cleaner casing may be tilted on its rear wheels to lift the nozzle off the floor, and a final stop means limiting the total downward movement of the handle.

Casing 6 of the cleaner is provided with a rear extension comprising side walls 15 and a top wall 16 having an upwardly projecting central portion 17. At the rear of central portion 17 is an opening which provides side wall ears 18 between which the lower end of the handle is pivoted. Extending between side wall ears 18 and fixed thereto is a shaft 19 which may be in the form of a pin which projects through an opening in one ear and screws into a hole in the other ear. Pivotally mounted on shaft 19 is a head 20 provided with a sleeve 21 which is split longitudinally as indicated at 22 and is provided with a threaded portion 23. The main portion of the handle comprises a metal tube 24, the lower end of which fits inside the sleeve 21 and is gripped therein by a nut 25 which screws on to threads 23, the arrangement being such that the nut compresses sleeve 21 against the tube. In the lower end of tube 24 is a plug receptacle 26 fastened into place by a set screw 27 and to which the lead wires 28 are connected. In the lower end of sleeve 21 is an electrical attachment plug 29 to which the motor leads 29' are connected. The conductors 28 are connected to the motor leads through the plug receptacle 26 and plug 29 when tube 24 is inserted in the sleeve, the plug receptacle being connected to the plug. With the foregoing arrangement, it will be seen that the handle is pivoted on shaft 19.

The lower portion of the rear extension comprises walls which define the air discharge conduit $29^a$ to which the dust bag 9 is connected, the inner end of the conduit connecting with the fan chamber. Conduit $29^a$ is located centrally of the rear extension and directly under the handle pivot. This gives a compact symmetrical arrangement of the parts and one which presents a pleasing appearance.

On head 20 are three pairs of stop lugs or stops 30, 31 and 32, the stop lugs 30 and 31 being spaced a greater distance apart than are the stop lugs 31 and 32. The stop lugs are adapted to be engaged by a pair of pawls 33 formed on a shaft 34. Shaft 34 is pivotally mounted in walls 15 as shown particularly in Fig. 3. One end of shaft 34 is supported in one of the walls 15 by a pin 35, and the other end is supported in the other wall by a pin 36. At the left hand end of shaft 34, as shown in Figs. 3 and 4, is a head 37 provided with a transverse slot 38 in which is fastened by pin 36, the lower end of an arm 39. The upper end of arm 39 projects out through top wall 16 and is provided on its end with an actuating finger or button 40. By pressing downward on the end of actuating finger or button 40, shaft 34 may be turned to move pawls 33 from

engagement with any of the stops 30, 31 or 32. The pawls 33 are normally biased to a position in engagement with the stops by a spring 41 which surrounds the left hand end of shaft 34 and has one end fixed to the shaft and the other end bent over and fixed to a pin 42 in one of the walls 15. Shaft 34 is bowed downwardly at its central portion between pawls 33 as indicated at 43, thus providing a cradle through which the cable comprising lead 29' extends. On the right hand end of shaft 34 an arm 44 is pivotally mounted, the same being held in position by a spacing sleeve 45. Arm 44 has to do with the adjusting means for the rear wheels 8 and possesses no function in so far as the handle adjusting means is concerned. The rear wheel adjusting means forms the subject matter of my application, Serial No. 694,094, filed on even date herewith.

When the handle is moved to its vertical position as indicated by dotted line in Fig. 1, head 20 is moved to a position such that pawls 33 engage stops 30. It will be noted that the rear sides of stops 30, 31, and 32 slope in a direction such that when the handle is raised, the pawls will slide over the stops. When pawls 33 are in contact with stops 30, the handle is locked in a vertical position, any substantial amount of additional forward movement being prevented by the top edge of opening 18 which acts as a stop for limiting further forward movement of the handle. The cleaner may now be lifted readily as a whole by the handle, the engagement of pawls 33 with stops 30 preventing the forward end of the cleaner from swinging downward on the handle pivot 19. In this connection, it will be understood that shaft 19 is at the rear of the center of gravity of the cleaner casing so that when lifted, there is a tendency for the cleaner to tip forward.

To release the handle from stops 30, plate 40 is pressed downward to move pawls 33 out of engagement with stops 30. The handle may now be moved downward to bring the pawls to the rear of stops 30. The handle may now be freely raised and lowered between the rear sides of stops 30 and the forward sides of stops 31, the ends of pawls 33 riding along the surface of head 20 between stops 30 and 31. This is the normal operating range through which the cleaner handle moves on its pivot for average operating conditions. If it is desired to leave the cleaner standing, the handle may be lowered until pawls 33 engage stops 31 when further downward movement of the handle is prevented. This is a position of the handle somewhat below that for normal operation. If it is desired to tilt the cleaner on its rear wheels so as to raise the suction nozzle off the floor, this may be accomplished by pressing downward on the handle while pawls 33 are in engagement with stops 31. It is desirable often to tilt the nozzle of the cleaner off the floor in going over the edges of rugs, for example.

If it is desired to lower the handle still further so as to bring it to substantially horizontal position to enable the cleaner to be pushed under low furniture, plate 40 may be pushed downward to move pawls 33 from engagement with stops 31, to permit the handle to be lowered and to bring pawls 33 beyond stops 31. The handle may now be lowered until pawls 33 engage stops 32, the arrangement being such that the handle may be moved to a substantially horizontal position. Stops 32 are so located that the handle cannot be lowered until it strikes the vacuum cleaner bag. The lowermost position of the handle is indicated in dotted line in Fig. 1. At any time, the handle may be moved upwardly, the pawls 33 sliding over the rear walls of the stops.

By my invention, it will be seen that I have provided a pivoted handle construction wherein the handle is mounted between ears on the top of the vacuum cleaner casing and wherein the stop means for the handle is enclosed within the casing. This gives a neat and attractive appearance to the outside of the cleaner. At the same time it enables me to provide stop means for the handle which is simple in structure and capable of being manufactured and assembled at low cost.

It will be noted that the motor leads 29' are entirely enclosed and that movement of the handle causes but little flexing of such leads. Thus the leads are well protected and subject to but little wear.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a vacuum cleaner, a casing including a hollow rear extension formed by spaced side walls and walls extending between the top and rear edges of the side walls, a discharge conduit between and at the lower ends of the side walls, means connecting said discharge conduit and said side walls whereby said discharge conduit reinforces said side walls, a handle pivoted on said walls, and handle stop means housed within said rear extension.

2. In a vacuum cleaner, a casing including a hollow rear extension formed by spaced side walls and walls extending between the top and rear edges of the side walls, a discharge conduit between and at the lower ends of the side walls, means connecting said discharge conduit and said side walls whereby said discharge conduit reinforces said side walls, a handle pivoted on said walls, handle stop means housed within said rear extension, and means including a lever projecting outside of said walls for controlling said handle stop means.

3. In a vacuum cleaner, a casing including a hollow rear extension formed by spaced side walls and walls extending between the top and rear edges of said side walls and having an opening therein, a discharge conduit between and at the lower ends of the side walls, means connecting said discharge conduit and said side walls whereby said discharge conduit reinforces said side walls, a handle extending through said opening and pivoted on said walls, and handle stop means house within said rear extension.

NOBLE H. WATTS.