April 5, 1932. H. R. BALLOU 1,852,100

SUCTION CLEANER

Filed Aug. 15, 1931

Fig. 1.

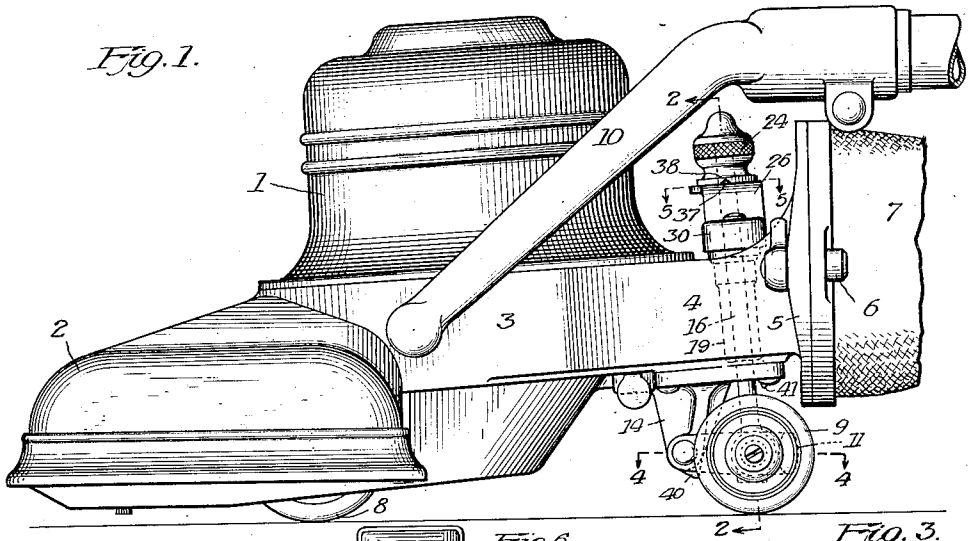


Fig. 2.

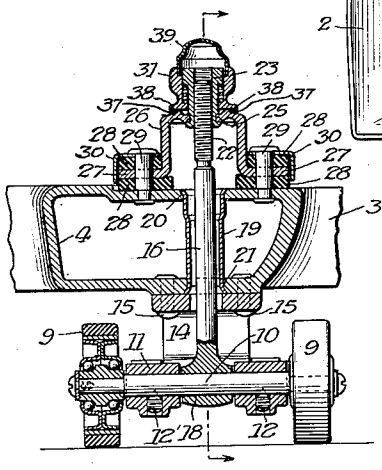


Fig. 6

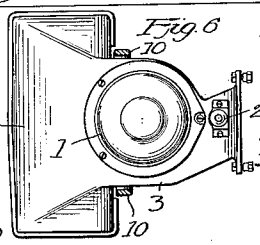


Fig. 3.

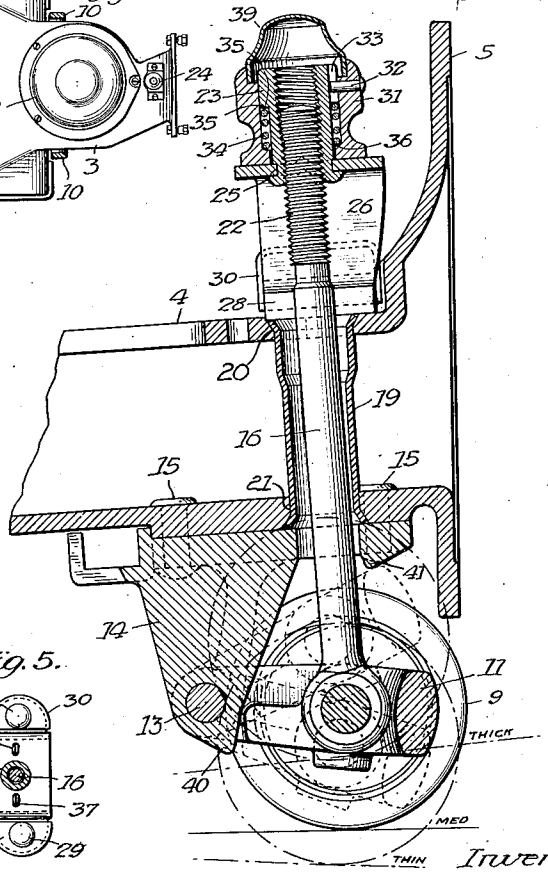


Fig. 4.

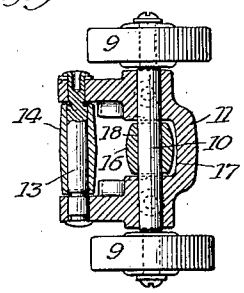
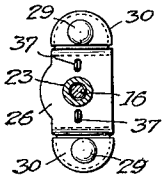


Fig. 5.



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UNITED STATES PATENT OFFICE

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SUCTION CLEANER

Application filed August 15, 1931. Serial No. 557,304.

The present invention relates to suction cleaners in general and particularly to new and novel means for adjusting the nozzle height of a suction cleaner. More specifically the invention comprises the provision of a new and improved rear-castor-height-adjusting means in a suction cleaner which is characterized by its simplicity and location relative to the cleaner body which protects it from injury through contact with articles of furniture, etc.

It is an object of the present invention to provide new and improved nozzle-height-adjusting means in a suction cleaner. A second object is the provision, in a suction cleaner, of new and improved rear-castor-height-adjusting means. A still further object is the provision, in a suction cleaner, of a centrally located rear castor adjustment. A still further object is the provision, in a suction cleaner, of rear-castor-adjusting means which are located centrally of the cleaner and part of which extends through the exhaust outlet of the cleaner. These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawings.

In the drawings, in which a preferred embodiment of the present invention is disclosed:—

Fig. 1 is a side view of a modern suction cleaner with the present invention embodied therein;

Fig. 2 is a section upon the line 2—2 of Figure 1;

Fig. 3 is an enlarged section upon the line 3—3 of Fig. 2;

Fig. 4 is a section upon the line 4—4 of Fig. 1;

Fig. 5 is a view looking in the direction of the arrows upon the line 5—5 of Figure 1;

Fig. 6 is a reduced plan view of the cleaner showing the relative position of the height-adjustng means on the body.

In the modern suction cleaner, it is necessary to provide means to adjust the height of the cleaner nozzle relative to the surface covering undergoing cleaning. With the cleaner in use upon a relatively thick surface covering, and therefore one characterized by long pile, it is necessary to raise the cleaner nozzle to compensate for the sinking into the said covering by the front supporting wheels. On a surface covering which is relatively thin, and therefore characterized by relatively short pile, the front supporting wheels have little opportunity to sink thereinto and it becomes necessary to lower the nozzle in order to bring the lips thereof into operative relationship with the said covering. This adjustment of the nozzle may be accomplished in one of several ways. The nozzle may be raised or lowered by raising or lowering both front and rear wheels, by adjusting only the front wheels, or by adjusting only the rear wheels. The present invention comprises the provision of new and novel adjusting means for raising and lowering the rear wheels of the cleaner.

The positioning of the nozzle relative to the surface covering by means of raising and lowering the rear supporting wheels to accomplish the pivoting of the cleaner body about the front supporting wheels as an axis is broadly old, and is well known. Heretofore many means have been used to accomplish the adjustment of the rear wheels such as sliding the wheel mounting vertically relative to the cleaner body, or mounting the wheel or wheels upon a pivoted arm whose position is controlled by manually operable means. In the majority of these adjustment means for the rear wheels, however, a part of the adjustment, usually that part which is adapted to be grasped by the hand of the operator to accomplish the adjustment, has been positioned at the side of the cleaner where it was readily accessible. In such a location the adjusting means is often contacted by articles of furniture with resulting injury thereto and often to the adjusting means itself through being bent. In the adjusting means for a rear castor constructed in accordance with the present invention, the means are positioned centrally of the cleaner body, the controlling elements and the hand-contacting parts being positioned in the longitudinal center line of the cleaner and, in fact, extending from below the cleaner

up through the exhaust outlet and being positioned upon the top thereof immediately in the rear of the motor casing. This construction has the obvious advantage of being in a protected position where it cannot contact walls, articles of furniture, etc.

Referring again to the drawings, a modern suction cleaner is disclosed which comprises a motor casing 1 which houses a suitable driving motor for the unshown suction-creating fan of the suction cleaner; a nozzle 2; a fan chamber 3, above which the motor casing 1 is positioned; and an exhaust outlet 4 which is provided at its end with an enlarged flange 5 to which is attached, by suitable means such as 6, the dust bag 7. The nozzle end of the cleaner is supported by front wheels 8, 8 of which only one is shown, there being a corresponding member upon the opposite side of the cleaner. At the rear of the cleaner immediately below the exhaust outlet 4 are positioned the rear castors or supporting wheels 9, 9, the controlling or adjusting means for which comprise the present invention. As in the usual suction cleaner a pivoted handle 10 is provided by which the cleaner may be propelled over the surface covering undergoing cleaning by the operator.

The spaced supporting wheels 9, 9 are rotatably mounted upon the transversely extending rear axle 10 which is itself non-rotatably seated in the pivoted U-bracket 11, said axle being non-rotatably and detachably held relative thereto by means of the removable set screws 12, 12. The bracket 11 is pivotally mounted upon the ends of transversely-extending pin 13 carried by the lower portion of bracket 14 which is itself rigidly secured to the underside of the exhaust passageway 4 by means of rivets 15, 15 etc. Midway between the supporting wheels 9, 9 in substantially the longitudinal center line of the cleaner and enclosing the wheel axle 10, is the lower end of the vertically extending shaft 16. The pivoted bracket 11 is provided with a cut-away or recessed portion 17 at its mid-portion to permit the seating of shaft 16 upon the axle 10, the shaft being provided with bore 18 to receive the shaft. Shaft 16 extends substantially vertically and passes upwardly through the exhaust passageway 4 which is provided with a tube or passageway 19. Tube 19 may be made of sheet metal or similar material and is sealed at its upper and lower ends in the openings 20 and 21 in the passageway 4 to prevent the leakage of the dirt-laden air to the exterior atmosphere. Tube 19 is of somewhat larger diameter or size than the shaft 16 to permit that member a slight transverse or swinging movement upon the adjustment of the supporting wheels. The upper end of the shaft 16 is threaded, as at 22, and is seated in screw-threaded relationship within the rotatable inner portion 23 of the manually rotatable nut member, indicated generally by the reference character 24.

The manually rotatable member 24 comprises the inner rotatable element 23 which is provided with a circumferential channel which is seated in the opening 25 in the transversely extending section of the bracket 26. The side arms of bracket 26 have horizontally extending feet 27, 27 each of which are seated between rubber cushions 28, 28 secured by means of the rivets 29, 29 and overlying cups 30, 30, to the top of the passageway 4. The exterior of adjustable nut member 24 comprises an enclosing knurled cylindrical portion 31 which is non-rotatable relative to, but axially slidable upon, the inner member 23 by means of its pin and groove relationship therewith; the pin 32 carried by member 31 being slidable in the vertical groove or slot 33 in the exterior of member 23. A spiral spring 34 is positioned between the outer circumferential shoulder 35 on member 23 and the inner circumferential shoulder 36 on the enclosing member 31 which serves at all times to force the member 31 downwardly against the upper surface of bracket 26 thereby functioning to maintain the projecting V-shaped lugs 37, 37 carried by that member in the seats 38, 38 provided in the bottom surface of member 31 to prevent unintended rotation. A cap 39 is provided which completes the exterior of the rotatable member 24 and which seats within the top of member 31 and in effect forming a part thereof.

In the adjustment of the rear supporting wheels by means of the adjustment constructed in accordance with the present invention the operator first lifts the outer knurled member 31 of the nut 24 in order to disengage the lugs 37, 37 from their cooperating notches 38, 38. This vertical movement of the enclosing member 31 effects a slight compression of the spiral spring 34 and the sliding of pin 32 in the slot 33. With the V-shaped lugs 37, 37 disengaged from their cooperating seats it is possible for the operator then to rotate the nut resulting in the rotating of the inner member 23, which encloses the upper threaded end 22 of shaft 16. Member 24 is rotated either clock-wise or counter clock-wise depending upon whether it is desired to raise or lower the rear supporting wheels. Upon the rotation of the nut member 24 shaft 16 is raised or lowered through the advancing upwardly or downwardly of its threaded end 22 in the vertically-stationary member 23. Upon being raised or lowered the shaft 16 functions to pivot the bracket 11 about its supporting pin 13 on the stationary bracket 14. This movement of bracket 11 obviously results in the raising or lowering of the supporting wheels 9, 9 as is clearly evidenced in Figure 3. The limits of the pivotal movement of the bracket 11,

and so the vertical adjustments of the wheels 9, 9, is determined by the projecting lugs 40 and 41 on the bracket 14. Upon the pivoting of bracket 11 downwardly its side arms are contacted by the lug 40 upon reaching a certain definite lower position and likewise, upon being pivoted upwardly, the transversely-extending portion of bracket 11 is contacted, at a definite upper position by the downwardly extending V-shaped lug 41 to prevent further upward movement. It is to be noted that the provision of the resilient mountings for the feet of the side arms of the bracket 26 results in the reduction of shock transmitted to the cleaner body from the supporting wheels, insures quieter operation, and permits a slight tilting of the bracket upon the vertical adjustment of shaft 16.

I claim:—

1. In a suction cleaner, a body comprising a nozzle, a fan casing and an exhaust outlet, means to raise and lower said nozzle comprising a supporting wheel, means movably mounting said wheel on said body, means connected to said mounting means extended upwardly through said exhaust outlet, and means on said exhaust outlet to vertically adjust said last-mentioned means.

2. In a suction cleaner, a body including an exhaust outlet, supporting means for said body comprising a wheel, means movably mounting said wheel under said exhaust outlet, a substantially vertical shaft connected to said mounting means, a hollow tube in said outlet enclosing said shaft, and manually rotatable means mounted on the top of said exhaust outlet to raise and lower said shaft through said tube to effect the vertical adjustment of said wheel relative to said body.

3. In a suction cleaner, a body including an exhaust outlet, a bracket secured to the underside of said outlet, spaced supporting wheels, means rotatably mounting said wheels on said bracket, means connected to said mounting means extended upwardly through the interior of said exhaust outlet, means preventing air-leakage from said outlet at the points of entrance and exit of said upwardly-extending means, and means positioned on the top of said exhaust outlet to raise and lower said upwardly-extending means to effect the vertical adjustment of said wheels relative to said body.

4. In a suction cleaner, a body including an exhaust outlet, a bracket secured to the underside of said outlet, spaced supporting wheels, means rotatably mounting said wheels on said bracket, a substantially vertical shaft pivotally connected to said mounting means and extended upwardly through said exhaust outlet in substantially the longitudinal center line of said cleaner, said shaft having a threaded upper end, and rotatable interiorly threaded means mounted on the top of said exhaust outlet in threaded relationship with said shaft adapted to raise or lower said shaft upon being rotated.

5. In a suction cleaner, a body including an exhaust outlet, a bracket secured to the underside of said outlet, spaced supporting wheels, means rotatably mounting said wheels on said bracket, a substantially vertical shaft extended upwardly through said exhaust outlet in substantially the longitudinal center line of said cleaner adapted to raise and lower said wheels, said shaft having a threaded upper end, a resiliently mounted bracket on the top of said exhaust outlet, an interiorly threaded manually rotatable member carried by said bracket in threaded relationship with said shaft and adapted to raise or lower same upon being rotated, and means preventing unintended rotation of said manually rotatable member.

6. In a suction cleaner, a body including an exhaust outlet, a bracket rigidly secured to the underside of said outlet, spaced supporting wheels, means pivotally mounting said wheels on said bracket, a substantially vertical shaft pivotally connected to said means and extended upwardly through said exhaust outlet in substantially the longitudinal center line of said cleaner, said shaft having a threaded upper end, a U-shaped bracket, resilient means seating said bracket on the upper surface of said exhaust outlet, a manually rotatable interiorly threaded member seated on said bracket in screw threaded relationship with said shaft and adapted to raise and lower said shaft upon being rotated, and means to prevent unintended rotation of said manually rotatable member.

7. In a suction cleaner, a body comprising a nozzle, a fan casing and an exhaust outlet, means to raise and lower said nozzle including a supporting wheel and means connected to said wheel extended upwardly through said exhaust outlet and means on said exhaust outlet to vertically adjust said last-mentioned means.

Signed at Cleveland, in the county of Cuyahoga and State of Ohio this 24th day of July A. D., 1931.

HARRY R. BALLOU.