June 4, 1940. B. C. BECKER 2,202,979

SUCTION CLEANER

Filed Nov. 29, 1937

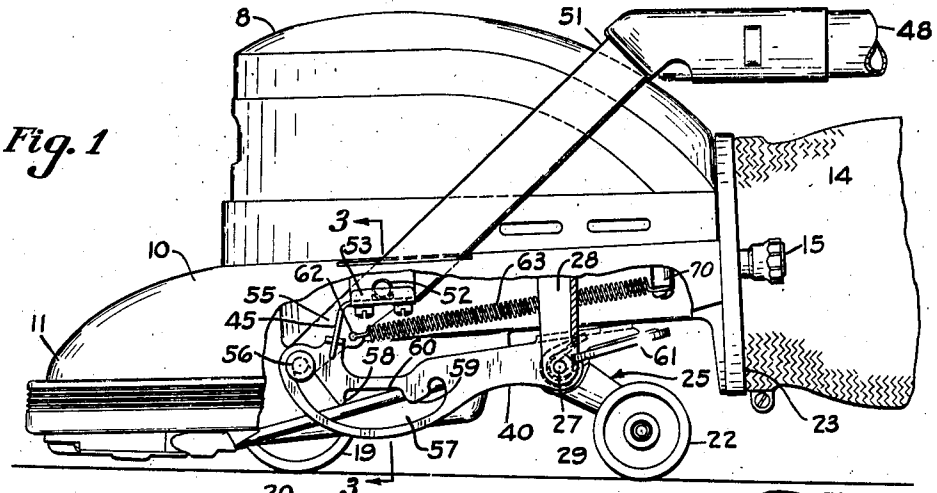

Fig. 1

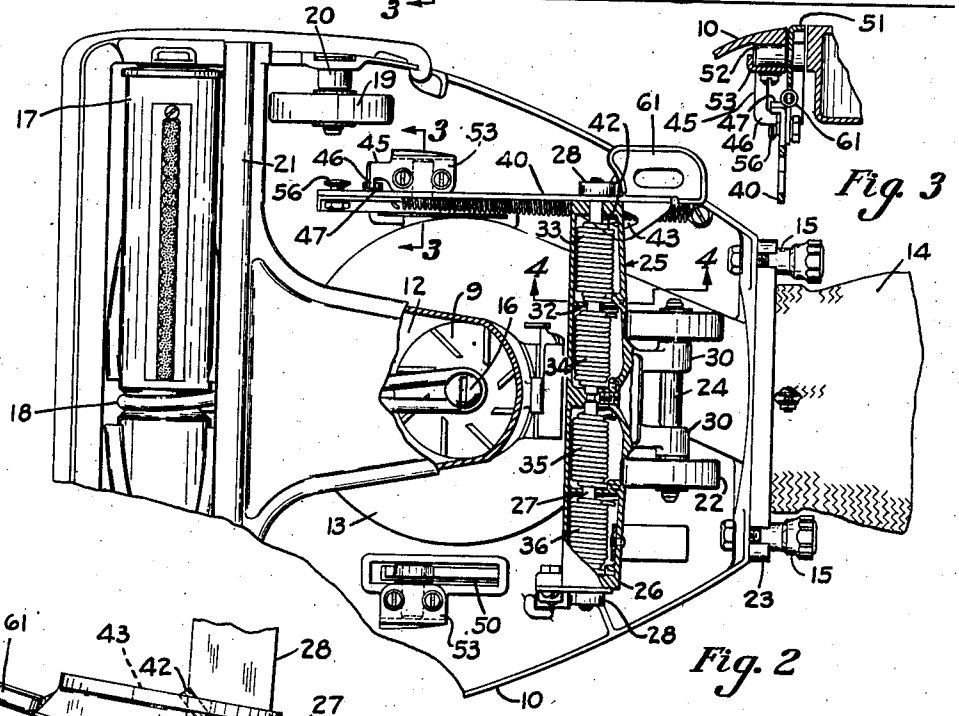

Fig. 2

Fig. 3

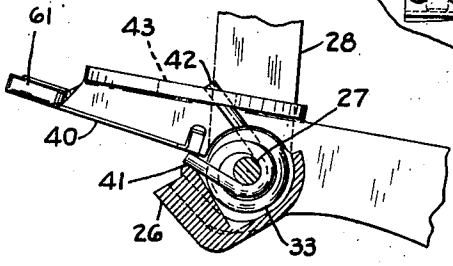

Fig. 4

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SUCTION CLEANER

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Application November 29, 1937, Serial No. 177,000
In Great Britain September 17, 1937

4 Claims. (Cl. 15—16)

This invention relates to suction cleaners in general, and more particularly to means for controlling the operative positions of the cleaner handle.

An object of the invention is to provide a new and improved suction cleaner. Another object of the invention is to provide tension means for supporting the normal cleaner weight and for also urging handle control means to different operative positions. Another object of the invention is to provide tension means for counterbalancing the weight of the cleaner. A further object is to provide an improved handle bail cooperable with the handle control means. Other objects and advantages of the invention will become apparent from the specification and drawing, wherein:

Fig. 1 is a side elevational view of a suction cleaner embodying the improved features, the casing being partly broken away to illustrate the construction;

Fig. 2 is a bottom plan view of the cleaner with parts in section to illustrate the tension means for supporting the normal weight of the cleaner and to control the handle control mechanism;

Fig. 3 is a section along the line 3—3 of Figures 1 and 2; and

Fig. 4 is a section along the line 4—4 of Fig. 2.

The suction cleaner herein disclosed comprises a main casing 10 having a nozzle 11 communicating with an air passage 12 connected to a fan chamber 13 which exhausts into a filter bag 14 attached to the cleaner casing 10 by means of bolt and nut connections 15. Within the fan chamber 13 is a fan 9 mounted on a motor shaft 16 which extends vertically into the motor housing 8. Disposed in the nozzle 11 is an agitator 17 driven by a belt 18 extending through the air passageway 12 to a pulley on the motor shaft 16. The body of the cleaner is supported upon a pair of front wheels 19 journalled on fixed rods 20 located rearwardly of the rear lip 21 of the nozzle 11. A pair of rear wheels 22 are located forwardly of the outlet 23 to the filter bag 14 and are journalled on the ends of a relatively short shaft 24 supported in a rear caster assembly 25.

The rear caster assembly 25 comprises an elongated hollow beam 26 extending transversely beneath the casing 10 and is journalled for limited rocking movement on a shaft 27 supported at its outer ends by a pair of vertical arms 28, 28 formed integral with the bottom wall of the casing 10. The beam 26 is arranged symmetrically with respect to the center line of the cleaner body and at its central portion is provided with rearwardly and downwardly extending arms 30 for supporting the shaft 24. Enclosed within the hollow beam 26 is a plurality of torsion springs 33, 34, 35 and 36, one of said springs being located in each of several compartments into which the beam is divided longitudinally by transverse webs 32. The springs are coiled around the bearing shaft 27, each having one end suitably anchored against the underside of the relatively stationary casing 10 and the other end exerting pressure upon the beam 26 at a point offset from its axis and in a direction to rotate the beam 26 clockwise on its supporting shaft as viewed in Figure 1, that is, in a direction to raise the rear portion of the cleaner body upwardly and to tilt the nozzle portion downwardly when the weight of the cleaner is supported by the wheels in contact with the floor surface.

Journaled on the beam shaft 27 exteriorly of one end of the beam 26 is a handle control lever 40. The torsion spring 33 has one end 41 exerting pressure upon the beam 26 as indicated in Figure 4 and its opposite end 42 is anchored in an opening 43 of the handle control lever 40. The torsion spring 33 not only acts to support the normal weight of the cleaner by exerting a force tending to rotate the caster assembly 25 in a clockwise direction as viewed in Figure 1, but also operates to rotate the handle control lever 40 in a counter-clockwise direction as viewed in Figure 1. Counter-clockwise movement of the handle control lever 40 is limited by means of a member 45 secured to the underside of the main casing 10 and having a lateral projection 46 which engages a lug 47 extending transversely from the handle control lever 40.

The cleaner is provided with a handle 48 having bifurcated arms 50 and 51 pivoted to the cleaner casing 10 by means of pins 52 removably secured to the underside of the cleaner casing by brackets 53. The bail arm 51 is provided with an extension 55 extending below its pivot point 52 and is provided at its extreme end with a pin 56 for movement in an irregular slot 57 in the handle control lever 40. The slot 57 is provided along its upper defining edge 60 with projections 58 and 59 to control the range of movement of the handle to different operative positions. The pin 56 is normally in contact with the upper defining edge 60 of the slot 57 due to the fact that the torsion spring 33 at all times urges the handle control lever 40 in counter-clockwise direction. The rear end of the handle control lever 40 is provided with a flat horizontal portion 61 which

extends beyond the casing 10 whereby the operator may step on the same to move the handle control lever 40 against the tension of the spring 33 for adjustment of the handle.

A counter-balancing spring 63 has one end connected to the bail arm 51 at a point 62 below the pivot point 52, and its opposite end is fixedly secured to a stud 70 at the rear end of the casing 10 rearwardly of the shaft 27, that is, rearwardly of the pivotal axis of the rear wheels 22. The balancing spring 63 corrects the forward downward tilting of the cleaner nozzle, due to the suction created, since it transmits the pressure exerted by the operator on the handle to the rear end of the cleaner, thereby exerting a downward component of force on the rear wheels 22 tending to lift the nozzle 11 from the surface undergoing cleaning. The spring 63 also tends to move the handle 48 to a vertical position.

The nozzle 11 is adjusted relatively to the surface undergoing cleaning by means of a nozzle adjusting means arranged at the opposite end of the hollow beam 26 as described in my Patent 2,177,974, filed August 23, 1937.

From the foregoing it will be perceived that the four tension members 33, 34, 35 and 36 support the normal weight of the cleaner, tending to urge the rear wheels 22 downwardly with respect to the cleaner casing 11, and that the torsion spring 33 also exerts a force on the handle control lever 40 in a counter-clockwise direction as viewed in Figure 1. In order to move the handle to any one of its operative positions, the operator merely steps on the foot pedal 61 to move the lever 40 in a clockwise direction as viewed in Fig. 1, against the tension of the torsion spring 33, which permits the operator to move the handle to any desired position. When pressure is removed from the handle control lever 40 the torsion spring 33 moves it in counter-clockwise direction to engage the pin 56 to lock the handle in an adjusted position.

I claim:

1. In a suction cleaner, a body, wheel supporting means pivotally mounted on said body, wheels carried by said supporting means, tension means acting on said supporting means and body to support the normal cleaner weight, a handle pivoted on said cleaner and movable to different operative positions, and foot operated handle control means pivotally mounted on said cleaner and operable against said tension means to control the operative positions of said handle.

2. In a suction cleaner, a body, wheel supporting means pivotally mounted on said body, wheels carried by said supporting means, spring means arranged about the pivotal axis of said supporting means and acting on said body and supporting means to support the normal cleaner weight, a handle pivoted on said cleaner and movable to different operative positions, and handle control means carried by said cleaner and operable against said spring means to control the operative positions of said handle.

3. In a suction cleaner, a body having a nozzle at its forward end, wheel supporting means pivotally mounted on said body toward the rear end of the latter, wheels carried by said supporting means, resilient means acting on said supporting means and body to support the normal cleaner weight, means for creating suction in said nozzle, said suction tending to pull said nozzle downwardly toward the surface undergoing cleaning and to effect a reduction in the weight supported by said resilient means, a handle pivotally mounted on said body and movable to different operative positions, said handle having an extension projecting below the handle pivotal axis, and tension means connected to said handle extension below the handle pivotal axis and extending rearwardly and connected to said casing rearwardly of the pivotal axis of said supporting means for counterbalancing said downward pull of suction at said nozzle and said effect of said suction on said resilient means when the operator is propelling said cleaner by said handle.

4. In a suction cleaner, a body having a nozzle at its forward end, wheel supporting means pivotally mounted on said body toward the rear end of the latter, wheels carried by said supporting means, resilient means acting on said supporting means and body to support the normal cleaner weight, means for creating suction in said nozzle, said suction tending to pull said nozzle downwardly toward the surface undergoing cleaning and to effect a reduction in the weight supported by said resilient means, a handle pivotally mounted on said body between said nozzle and said pivotal axis of said supporting means and movable to different operative positions, and tension means connected to said handle and connected to said body rearwardly of the pivotal axis of said supporting means for counterbalancing said downward pull of suction at said nozzle and said suction effect on said resilient means when the operator is propelling said cleaner by said handle.

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