

March 6, 1962

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3,023,838

CARRYING HANDLE FOR SUCTION CLEANER

Filed April 1, 1958

2 Sheets-Sheet 1

FIG. 1

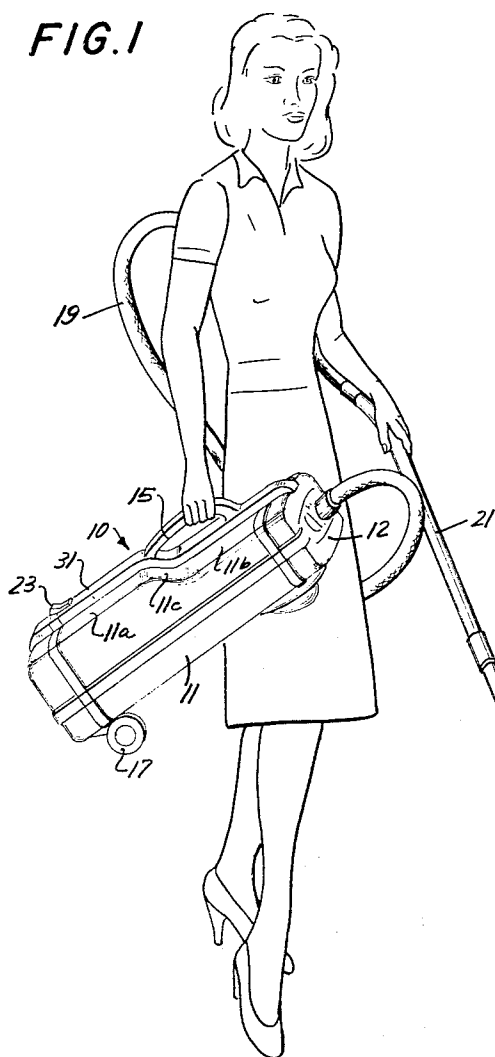


FIG. 2

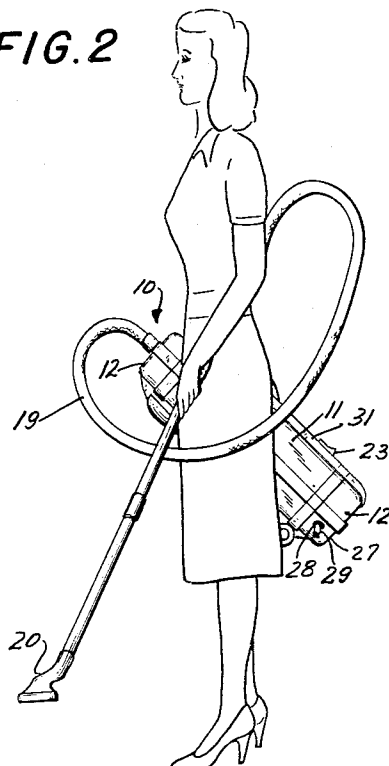


FIG. 3

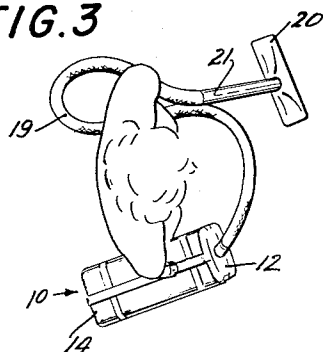
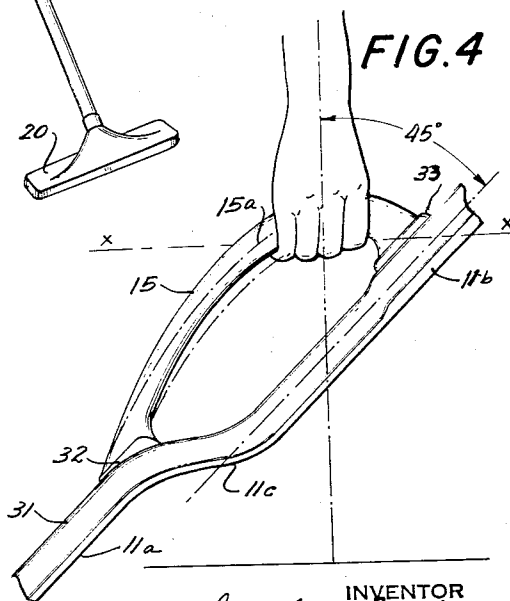


FIG. 4



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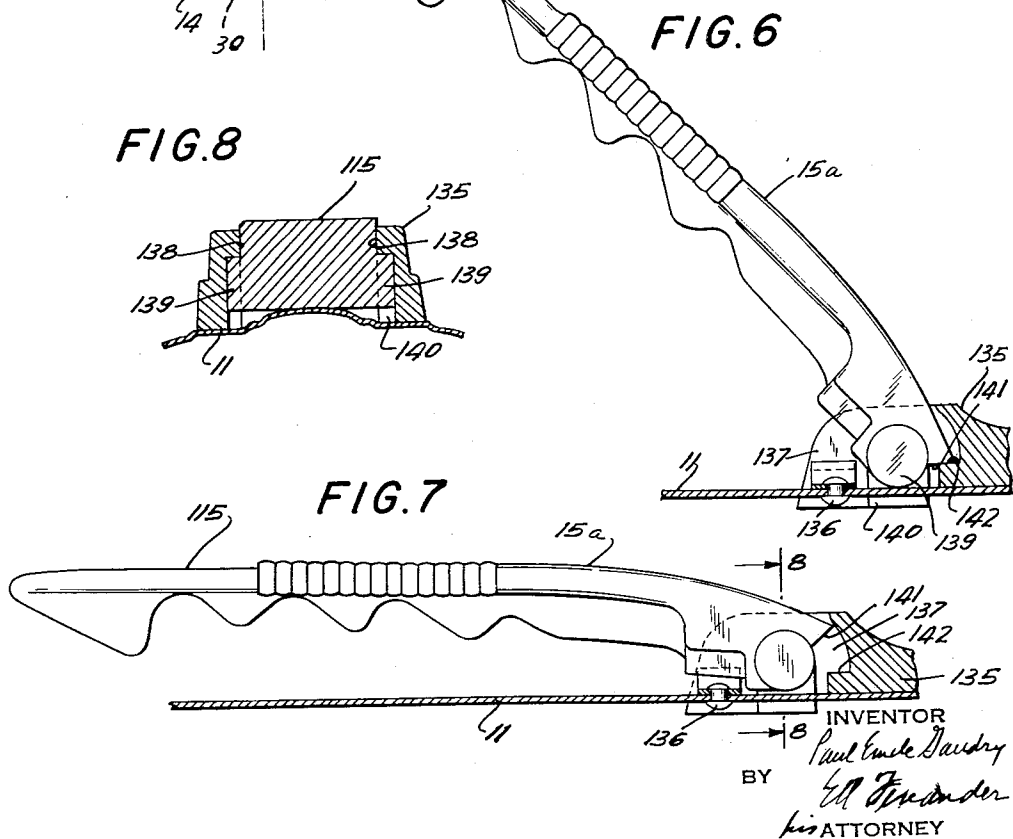
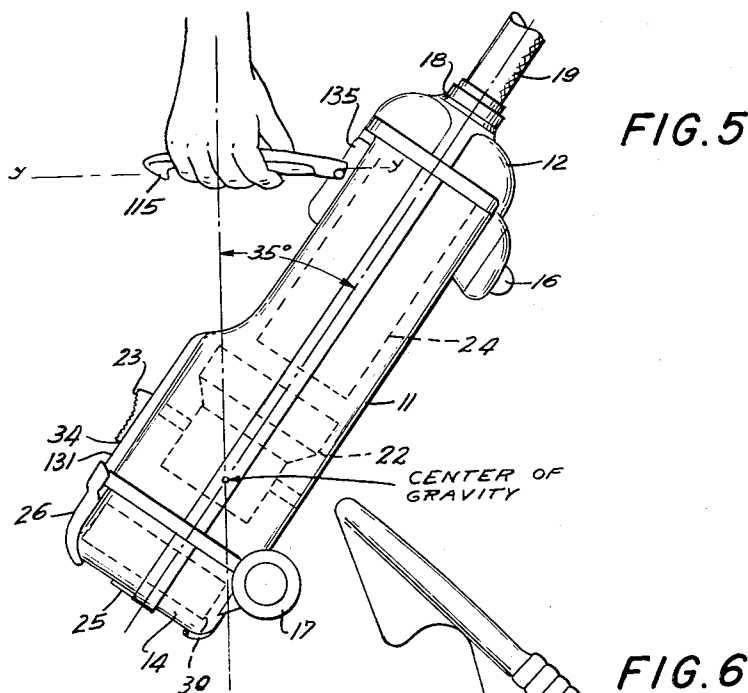


FIG. 8

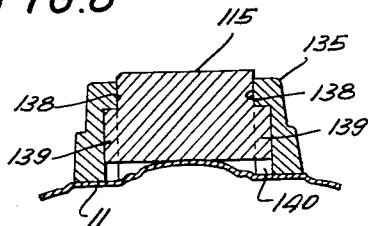
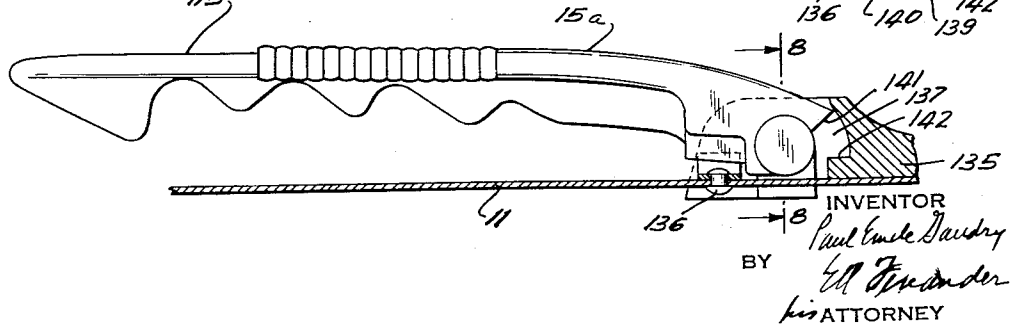


FIG. 7



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CARRYING HANDLE FOR SUCTION CLEANER
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Filed Apr. 1, 1958, Ser. No. 725,724

7 Claims. (Cl. 183—37)

My invention relates to suction cleaners and is especially concerned with a carrying handle for a suction cleaner.

In the use of elongated suction cleaners of the horizontal type having a flexible hose connected at one end to the suction inlet of the cleaner and at the opposite end to a wand to which a cleaning tool is connected, it is often desirable that all of the suction cleaning apparatus just referred to be transported from one place to another without disconnecting the parts. To carry suction cleaning apparatus as a unit without disconnecting the parts, an individual usually grasps the wand in one hand at one side of the body and the handle of the suction cleaner in the other hand at the opposite side of the body.

It has usually been the practice for elongated suction cleaners to have a handle which is fixed to the casing of the cleaner at a region of balance, so that the cleaner is held in an essentially horizontal position. When carrying suction cleaning apparatus which includes a suction cleaner having a handle fixed in this manner, the ends of the flexible suction hose are supported at a relatively low level near the hands of the individual and the central part of the suction hose therefore tends to contact and drag along the floor. Even if the end of the suction hose connected to the upper end of the wand should be at a higher level than the end of the hose projecting forward from the air inlet end of the suction cleaner, there still is an objectionable tendency for the central part of the suction hose to contact and drag along the floor. This is particularly true when all of the suction cleaning apparatus parts are moved as a unit on a stairway from one floor to a higher floor. Also, there is an objectionable tendency for the hose to project out in front of the individual, making the apparatus bulky to carry and difficult to maneuver around furniture, in narrow passages and through doorways.

The object of my invention is to provide an improved handle for carrying an elongated suction cleaner.

Another object is to provide an improved handle for supporting an elongated suction cleaner at an acute angle of about 30 to 45 degrees to the vertical with the center of gravity of the cleaner beneath and in vertical alignment with the hand grip provided by the handle.

Further objects and advantages of the invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the invention, reference may be had to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a front perspective view illustrating my improved suction cleaning apparatus and the manner in which it can be carried;

FIG. 2 is a side elevational view of the suction cleaning apparatus illustrated in FIG. 1;

FIG. 3 is a top plan view of the suction cleaning apparatus shown in FIGS. 1 and 2;

FIG. 4 is an enlarged fragmentary side elevational view of parts shown in FIG. 1 to illustrate details;

FIG. 5 is a fragmentary side elevational view of suction cleaning apparatus like that shown in FIGS. 1 to 4 illustrating a modification of the invention;

FIGS. 6 and 7 are enlarged side elevational views, part-

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ly broken away and in section, illustrating parts shown in FIG. 5 in different positions; and

FIG. 8 is a sectional view taken at line 8—8 of FIG. 7.

Referring to the drawings, I have shown my invention applied to a horizontal tank-type suction cleaner 10 comprising a casing 11, a front end cover 12 and rear end cover 14. The casing 11 is provided with a handle 15 and wheels 16 and 17 to facilitate movement thereof on a supporting surface, the wheels 17 being at opposing sides of the casing 11 and the single caster wheel 16 at the front end of the casing being disposed between the side walls of the cleaner.

The front end cover 12, which is removably secured to the end of casing 11 in any suitable manner (not shown) is provided with an inlet 18 to which a flexible suction hose 19 is removably connected. A suitable cleaning tool like a nozzle 20, for example, is connected to an elongated wand or tube 21 which in turn is connected to the outer free end of the suction hose 19 and through which air flows into the front end of the casing by a suitable motor-fan unit 22 disposed therein. The motor-fan unit 22 is connected in an electrical circuit having a switch (not shown) provided with a manually operable control member 23 at the top of the casing 11. Dirt entrained in air drawn into the inlet 18 is separated from air when it passes through a dust collecting member 24, and air from which dirt has been removed is discharged from the casing through an opening 25 in the rear end cover 14.

The rear end cover 14 may be pivotally mounted in any suitable manner (not shown) for rocking movement about an axis coinciding with the axis of the rear wheels 17. A latch 26 may be provided at the top of the rear end cover 14 for releasably latching the end cover at the rear end of the casing 11.

Referring to FIG. 2, an opening 27 is formed in a side wall of the rear end cover 14 through which is adapted to pass an electrical cord 28 at the outer free end of which is provided a conventional electrical plug 29 which arrests inward movement of the cord through the opening. The cord 28 is arranged to be wound on a reel 30 rotatably mounted within the rear end cover. The inner end of the cord 28 is connected in any suitable manner (not shown) to the motor-fan unit circuit. The reel 30 may be of a type on which the cord 28 is automatically wound when it is released, suitable mechanism being provided to render the reel ineffective to retract the cord 28 when all or any part thereof is unwound from the reel. Cord winding structure of the type just referred to is illustrated and described fully in copending Raymond Descarries application Serial No. 725,732, filed April 1, 1958, to which reference may be had if desired, further description and illustration of the cord reel 30 and operating mechanism therefor not being believed necessary for an understanding of my invention.

Referring to FIGS. 1 to 4, the top of the casing 11 includes two wall portions 11a and 11b at different elevations which are joined by a sloping wall portion 11c. A trim strip 31, which conforms to the top of the casing 11 and includes two sections at different elevations extends lengthwise of the casing top and is fixed thereto in any suitable manner. The trim strip 31, which is of inverted U-shape, is provided with elongated slots 32 and 33 in which the ends of the handle 15 are anchored. The trim strip is also provided with a slot 34 through which the switch control member 23 extends, as best shown in FIG. 5.

The handle 15 desirably is formed of a material, such as a suitable plastic, for example, to provide a hand grip which essentially keeps its shape and yet is slightly flexible and resilient in character to facilitate carrying the suction cleaner in a manner which will be explained

presently. The forward part of the handle 15 gradually becomes thicker at 15a at the region at 33 at which it is anchored to the trim strip 31. The extreme forward part of the handle projecting from the trim strip is practically perpendicular thereto and merges into a part forming the hand grip portion in FIG. 4 having a pronounced radius of curvature. From the hand grip portion in FIG. 4 the handle 15 slopes downwardly more or less gradually toward the trim strip section at the higher elevation, the rear end of the handle being anchored to the trim strip at the opening 32 therein. By providing a handle 15 of the character just described and like that shown most clearly in FIG. 4, a hand grip 15a is provided for the suction cleaner which is essentially horizontal, as indicated by the dotted line x—x, and at an acute angle to the longitudinal axis of the suction cleaner 10.

In FIGS. 5 to 8 I have shown another form of handle 115 for the suction cleaner which is generally like the suction cleaner 10 in FIGS. 1 to 4 with like parts referred to by the same reference numerals, the motor-fan unit 22 and dust collecting member 24 of the suction cleaner 10 being diagrammatically illustrated only in FIG. 5. The suction cleaner in FIGS. 5 to 8 differs from the form of suction cleaner just described in that a trim strip 131 extends lengthwise of the section of the casing top at the higher elevation only, a part 135 of the handle 115 being fixed at 136 to the forward end of the casing with the handle extending rearwardly therefrom to the forward end of the trim strip 131 when it is in its down position illustrated in FIG. 7.

The handle part 135 forms a bracket or body portion fixed directly to the top part of the casing at 136. The bracket 135 is formed with a cavity or recess 137 having spaced apart inner vertical walls 138 forming a gap in which the hinge end of the handle 115 is movable. The opposing sides of the handle 115 are provided with pins 139 which may be formed integrally therewith and project outwardly therefrom. Below the vertical walls 138, at the region at which the handle 115 is angularly movable, the opposing sides of the body portion 135 are formed with notches 140 which receive and position the pins 139 beneath the vertical walls 138, the latter serving as overhanging ledges for retaining the handle in the bracket 135. Since the notches 140 extend to the bottom of the bracket 135, the handle 115 is first positioned on the bracket with the pins 139 disposed in the notches 140, after which the bracket is secured at 136 to the top of the casing 11.

At the vicinity of the pins 139 about which the handle 115 is movable, the latter is provided with a surface 141 extending radially outward from the pivotal axis which is arranged to engage a part 142 formed at the forward end of the bracket cavity 137 and serves as a stop to limit upward movement of the handle 115, as illustrated in FIG. 6.

Referring to FIG. 5, it will be seen that the handle 115 is generally like the handle 15 shown in FIGS. 1 to 4 in that it provides a hand grip for the suction cleaner which is essentially horizontal, as indicated by the dotted line y—y and at an acute angle to the longitudinal axis of the suction cleaner.

The center of gravity of an elongated suction cleaner of the general type illustrated and described herein usually is located in a zone which is about one-third of the length of the cleaner from the air outlet end. This will vary, of course, with different constructions and special features which are embodied in the cleaner, such as holders for cleaning tools and accessories, and a cord winder which may be either detachably mounted at the end of the cleaner or provided within the cleaner as cord winder 30 diagrammatically illustrated in FIG. 5.

The handle 15 is fixed to the casing 11 at a position of "unbalance," that is, the handle is longitudinally offset with respect to the center of gravity of the suction cleaner 10, the center of gravity being nearer to the rear

end cover 14 than to the front end cover 12, as shown in FIG. 5. Therefore, when the suction cleaner 10 is raised by its handle, the cleaner will assume an inclined position with the air inlet end 18 inclined upward. As a result, an individual's hand will always tend to slide upward along the handle to the hand grip portion 15a in FIG. 4 irrespective of where handle 15 is grasped.

The hand grip portion 15a is considerably nearer to the air inlet 18 than to the air outlet 25, and, when the suction cleaner is being held at this region of the handle, the center of gravity of the cleaner is beneath the hand grip region 15a and in vertical alignment therewith. With the handle arrangement illustrated and just described, the suction cleaner is inclined at an acute angle to the vertical with its center of gravity not only in alignment with the hand grip portion 15a of the handle but also with the arm of the individual when it is extended vertically downward at the side of the body in carrying the suction cleaner.

To find a good hand grasp region of the handle 15 provided by the invention is more or less automatic because the hand naturally slides along the handle 15 until it reaches a position of balance at the hand grip portion 15a where the center of gravity is beneath and in vertical alignment therewith. On the other hand, to find a good hand grasp region of the handle of a tank-type suction cleaner located above the vicinity of the center of gravity of the cleaner is often a case of trial and error, especially when the center of gravity of the cleaner is changed by the addition of a tool holder or cord winder as accessories.

The handle 115 in FIGS. 5 to 8 is like the handle 15 in FIGS. 1 to 4 in that an individual does not need to find by trial and error the most comfortable region at which to grasp it to carry the suction cleaner. Irrespective of the region at which the handle 115 is grasped, the suction cleaner automatically tilts upon being raised from a supporting surface and takes a position wherein the center of gravity is beneath and in vertical alignment with the region of the handle grasped by the individual.

In FIGS. 1 to 4 the angular position of the hand grip portion 15 with respect to the longitudinal axis of the suction cleaner is essentially constant, this being changed slightly when the dead weight of the cleaner is being supported by the handle. This is so because, as explained above, the handle 15 when formed of plastic is slightly resilient and may flex slightly when carrying the weight of the cleaner. In FIGS. 5 to 8, an individual initially raises the handle 115 from its horizontal position illustrated in FIG. 7 in order to grasp it, and when the handle reaches its uppermost position it is then effective to carry the full dead weight of the cleaner. As is shown in FIG. 5, the handle 115 is in the horizontal position indicated by the dotted line y—y when the cleaner is in its normal carrying position.

With the suction cleaner 10 inclined to the vertical, as best shown in FIG. 2, the overall vertical extent of the cleaner is appreciably greater than the horizontal extent at the side of an individual's body, so that the suction cleaner does not project forward or rearward as much as it would if it were being carried in a horizontal position. In the embodiment of FIGS. 1 to 4 it will be seen that the angle of inclination of the cleaner to the vertical is about 45°, as indicated in FIG. 4, while in FIG. 5 this angle of inclination is about 35°. It has been found that an angle of inclination which is in a range of from about 30° to 45° is satisfactory.

In FIGS. 1 to 3 the suction cleaner 10, suction hose 19, wand 21 and nozzle 20, which are connected to one another, form what may be referred to as a suction cleaning apparatus unit. When the suction cleaner 10 is being held at an acute angle to the vertical at one side of the body and the wand is held at the opposite side of the body, the flexible suction hose 19 of the unit takes a shape like that of a catenary, as seen in FIG. 2 in side elevation, the hose having inwardly bent ends whose

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extreme outer portions project upwardly at both sides of the body and forward and rearward of the body at the suction cleaner and wand sides, respectively.

With this carrying arrangement, the suction hose 19 is positioned across the front of the body and between the wand 21 and the side of the body adjacent thereto. Since the air inlet end 18 of the suction cleaner 10 is inclined upward and forward at one side of the body and the suction hose end of the wand 21 is inclined rearward and upward at the other side of the body, the suction hose is always positioned across the front of the body at a relatively high level, thereby permitting an individual to walk freely in furnished areas of rooms and walk up and down stairs without the central part of the hose tending to contact and drag along the floor or staircase.

Further, the suction cleaner 10, hose 19, wand 21 and nozzle 20 are kept comfortably about and relatively close to an individual, as illustrated in FIG. 5, thereby making it easy to maneuver in narrow passages and doorways and between closely positioned pieces of furniture. In the top plan view illustrated in FIG. 5, it will be observed that the hose 19 and suction cleaner 10 have an S-shape with a portion of the hose concealed from view by the arm at the wand side of the body.

While particular embodiments of the invention have been shown and described, such variations and modifications are contemplated as fall within the true spirit and scope of the invention, as pointed out in the following claims.

I claim:

1. An elongated tank-type suction cleaner having a casing provided with an air inlet and an air outlet removed therefrom, a handle at a wall of the casing, said handle comprising an elongated member, means for pivotally mounting said member at the wall for angular movement about an axis perpendicular to the longitudinal axis of the cleaner, said member being movable from a first position alongside of the wall to a second higher position at an acute angle to the wall, and means to arrest movement of said member when it reaches the second higher position, said member in the second higher position providing a hand grip at said acute angle to the wall which assumes a substantially horizontal position when the cleaner is lifted and carried.

2. A suction cleaner as set forth in claim 1 in which said pivotal mounting means comprises a hollow body at the wall and structure for fixing said member within said body for angular movement therein, said member having a surface angularly movable therewith, and a part within said body in the path of movement of said surface and serving as a stop to arrest movement of said member at the second higher position to provide said hand grip at an acute angle to the wall.

3. In an elongated suction cleaner having an air inlet and an air outlet at opposite sides of its center of gravity, a handle, means for fixing said handle to the top of the cleaner at a region of unbalance which is disposed forward from the center of gravity of the cleaner toward the inlet, said handle including a hand grip which is at the immediate vicinity of said handle fixing means, said handle comprising an elongated member and said fixing means comprising structure for pivotally mounting said member at the top of the cleaner for angular movement about an axis perpendicular to the longitudinal axis of the cleaner, said member being movable from a first position alongside of the cleaner and adjacent thereto to a second higher position at an acute angle to the longitudinal axis of the cleaner, and means to arrest upward movement of said member at the second higher position, said hand grip assuming a substantially horizontal position when the cleaner is lifted and carried and said member moves to its second higher position, and said fixing means fixing said elongated member to the top of the cleaner at the region of unbalance which will position the center of gravity of the cleaner directly beneath the hand grip in vertical

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alignment therewith and the longitudinal axis of the cleaner will be at an acute angle of about 30 to 45 degrees to the vertical with the air inlet end of the cleaner inclined upward when the hand grip assumes the substantially horizontal position responsive to lifting and carrying of the cleaner.

4. An elongated tank-type suction cleaner having a casing provided with an air inlet and an air outlet at opposite ends thereof, said casing having a low section and a higher section which extend from the air inlet and air outlet toward a region intermediate the ends of the casing and a section therebetween having a sloping top, the outer end of the low section being adjacent to the inlet and the outer end of the higher section being adjacent to the outlet, dust collecting means in the low section, air moving means in the higher section, a handle, means for fixing said handle to the top of said low section at a region of unbalance of the cleaner, said handle including a hand grip which is at the immediate vicinity of said handle fixing means, said handle comprising an elongated member and said fixing means comprising structure for pivotally mounting said member at the top of said low section for angular movement about an axis perpendicular to the longitudinal axis of the cleaner, said member in a first position being alongside the top of said low section and having its outer free end at the vicinity of said sloping top, said member being movable from the first position at the top of said low section to a second higher position at an acute angle to the longitudinal axis of said casing, and means to arrest movement of said member when the latter reaches the second higher position, said hand grip assuming a substantially horizontal position when the cleaner is lifted and carried and said member moves to its second higher position.

5. A suction cleaner as set forth in claim 4 in which said fixing means structure pivotally mounts said elongated member to the top of said low section at the region of unbalance of the cleaner which will position the longitudinal axis of the cleaner at an acute angle of about 30 to 45 degrees to the vertical with the inlet end of the casing inclined upward when said hand grip assumes the substantially horizontal position responsive to lifting and carrying of the cleaner.

6. In an elongated suction cleaner having an air inlet and an air outlet at opposite ends thereof and dirt collecting means and air moving means therebetween, the dirt collecting means being disposed adjacent to the inlet and the air moving means adjacent to the outlet and the center of gravity of the cleaner being nearer to the outlet than to the inlet, a handle, means for fixing said handle to the top of the cleaner at a region of unbalance between its center of gravity and the inlet, said handle comprising an elongated member including a hand grip which is at the immediate vicinity of said handle fixing means and along a line at an acute angle to the longitudinal axis of the cleaner, said hand grip assuming a substantially horizontal position responsive to lifting and carrying of the cleaner, and said fixing means fixing said elongated member to the top of the cleaner at the region of unbalance which will position the center of gravity of the cleaner directly beneath the hand grip in vertical alignment therewith and the longitudinal axis of the cleaner will be at an acute angle of about 30 to 45 degrees to the vertical with the air inlet end of the cleaner inclined upward when said hand grip assumes the substantially horizontal position responsive to lifting and carrying of the cleaner.

7. An elongated tank-type suction cleaner having a casing provided with an air inlet and an air outlet at opposite ends thereof, said casing having a low section and a higher section which extend from the air inlet and air outlet toward a region intermediate the ends of the casing and a section therebetween having a sloping top, the outer end of the low section being adjacent to the inlet and the outer end of the higher section being adjacent to the outlet, dust collecting means in the low sec-

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tion, air moving means in the higher section, a handle, means for fixing said handle to the top of said low section at a region of unbalance of the cleaner, said handle comprising an elongated member including a hand grip which is at the immediate vicinity of said handle fixing means and along a line at an acute angle to the longitudinal axis of the cleaner, said hand grip assuming a substantially horizontal position responsive to lifting and carrying of the cleaner, and said fixing means fixing said elongated member to the top of said casing at the region of unbalance which will position the center of gravity of the cleaner directly beneath the hand grip in vertical alignment therewith and the longitudinal axis of the cleaner will be at an acute angle of about 30 to 45 degrees to the vertical with the air inlet end of the casing inclined upward when said hand grip assumes the sub-

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stantially horizontal position responsive to lifting and carrying of the cleaner.

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