Dec. 24, 1940. C. BURKHARDT 2,225,621

SUCTION CLEANER

Filed Jan. 31, 1934 4 Sheets-Sheet 1

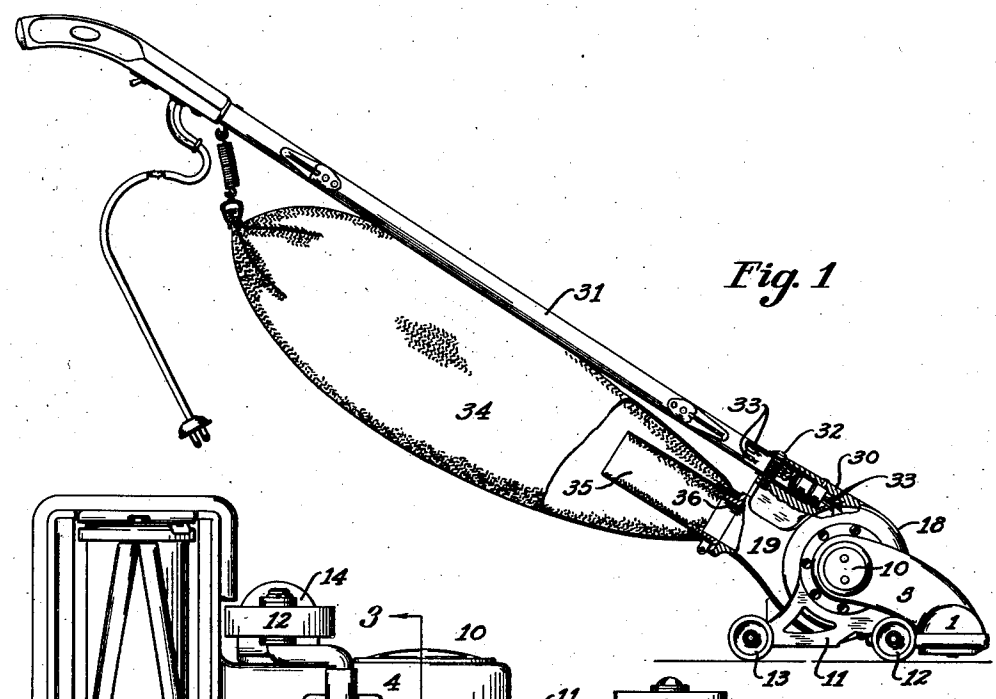


Fig. 1

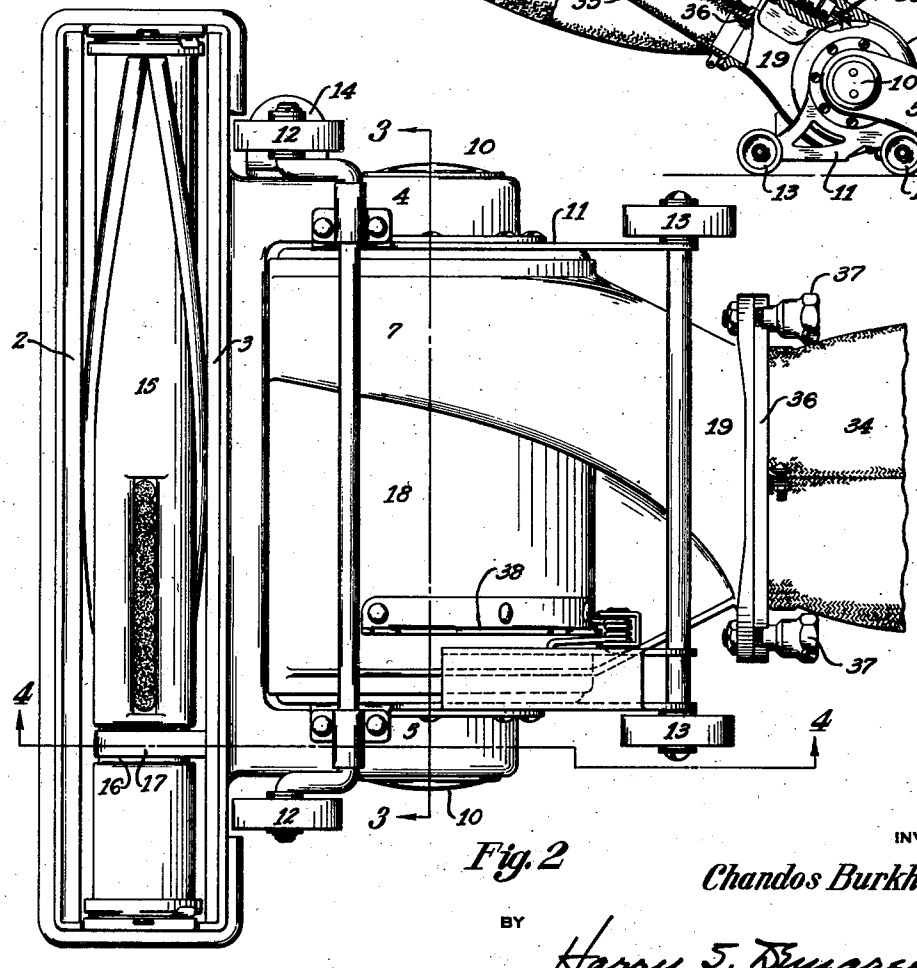


Fig. 2

INVENTOR

Chandos Burkhardt

BY

Harry S. Bucarse

ATTORNEY

Dec. 24, 1940. C. BURKHARDT 2,225,621

SUCTION CLEANER

Filed Jan. 31, 1934 4 Sheets-Sheet 2

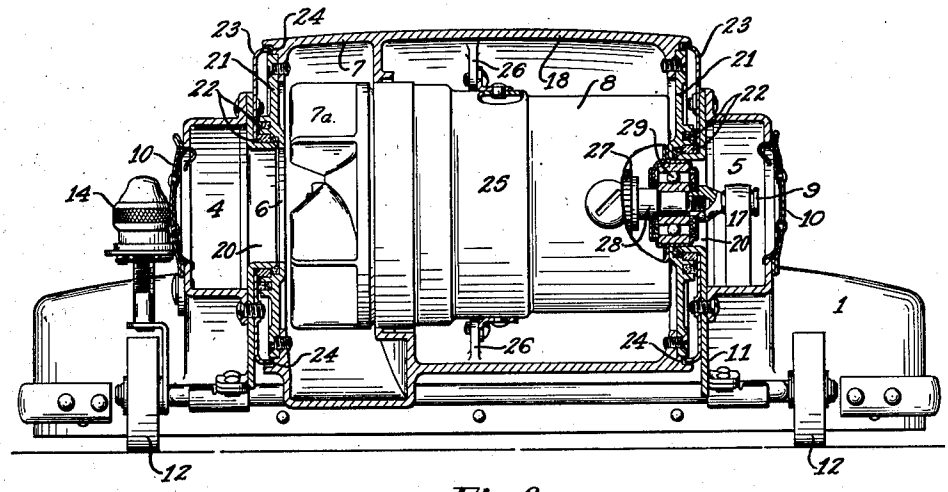


Fig. 3

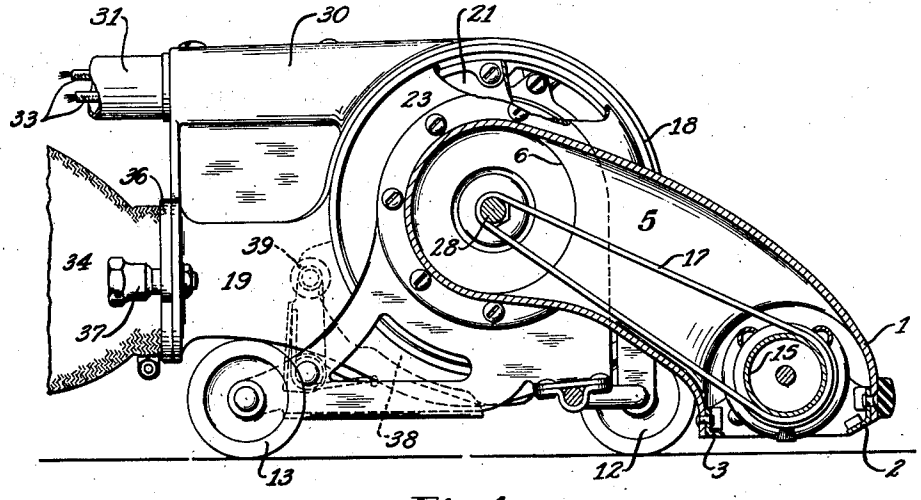


Fig. 4

INVENTOR

Chandos Burkhardt

BY

Harry E. Dwaree

ATTORNEY

Dec. 24, 1940. C. BURKHARDT 2,225,621

SUCTION CLEANER

Filed Jan. 31, 1934 4 Sheets-Sheet 3

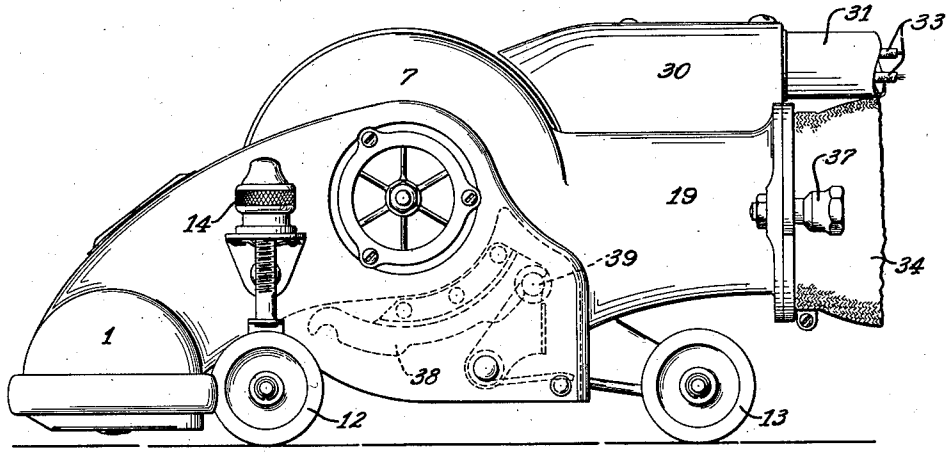


Fig. 5

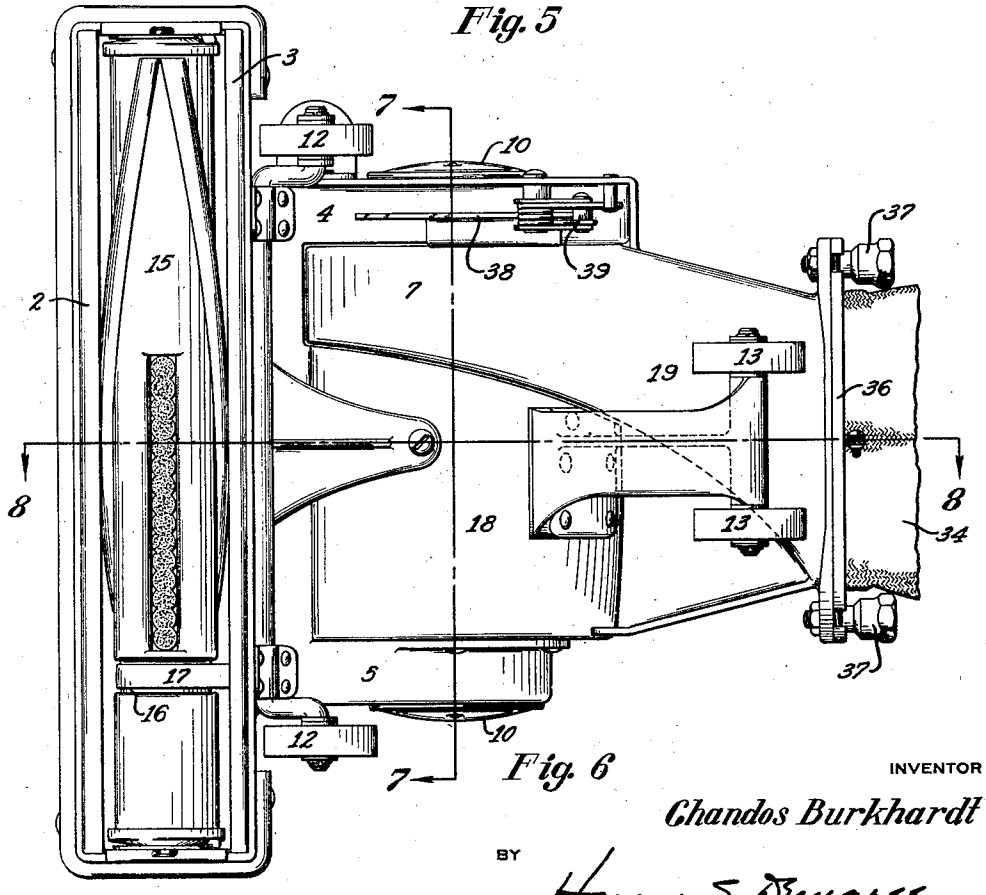


Fig. 6

INVENTOR

Chandos Burkhardt

BY

Harry S. Duarte

ATTORNEY

Dec. 24, 1940. C. BURKHARDT 2,225,621

SUCTION CLEANER

Filed Jan. 31, 1934 4 Sheets-Sheet 4

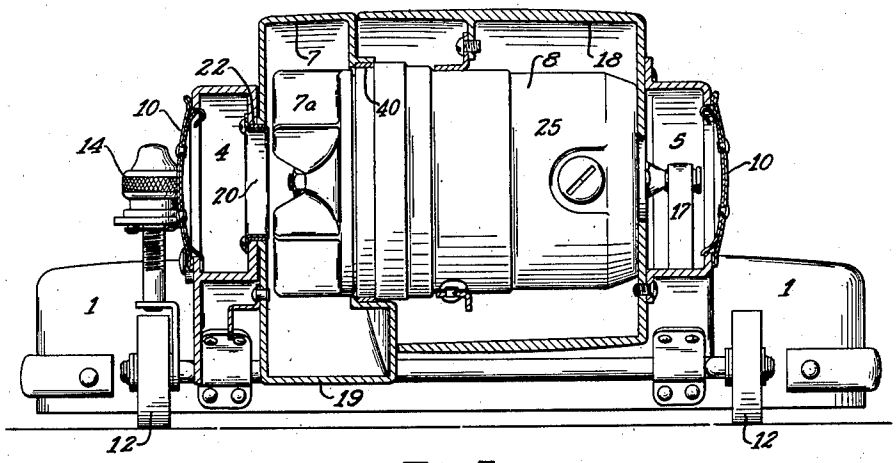


Fig. 7

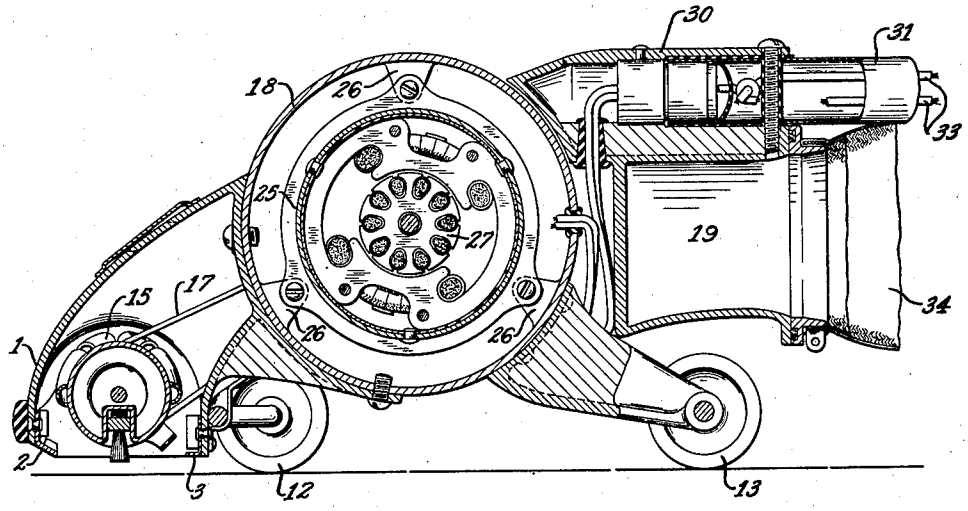


Fig. 8

INVENTOR

Chandos Burkhardt

BY

Harry S. Demarse

ATTORNEY

Patented Dec. 24, 1940 2,225,621

UNITED STATES PATENT OFFICE

2,225,621

SUCTION CLEANER

Chandos Burkhardt, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application January 31, 1934, Serial No. 709,073

30 Claims. (Cl. 15—6)

The present invention relates to suction cleaners in general and particularly to new and novel improvements in the relationship between the parts of a suction cleaner designed for on-the-floor cleaning. More specifically the invention comprises a suction cleaner in which no relative movement takes place between the dust bag and the cleaner handle which supports it.

It is an object of the persent invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved suction cleaner in which the handle, the fan chamber and the dust bag are mounted for pivotal movement as a unit about the motor axis. Still another object is the provision of a suction cleaner in which the motor and the fan chamber are mounted for pivotal movement about the axis of the motor. A still further object is the provision of a suction cleaner in which the cleaner handle is rigidly attached to the motor and the fan chamber, the three elements being pivotally connected to the remainder of the machine in a novel manner. A still further object is the provision of a suction cleaner in which the nozzle is formed with a supporting frame and pivotally carries the remainder of the machine in a novel manner. Still another object is the provision of a suction cleaner in which a movably mounted body, including the nozzle, pivotally supports the remainder of the cleaner including the motor, fan chamber, exhaust outlet, handle and the dust bag, means being provided to retain resistingly the pivotally mounted parts in an angular position or within a range of angular positions. Another object is the provision of a suction cleaner in which the fan chamber is movable relative to the suction nozzle and to the driving motor. These and other more specific objects will appear upon reading the following specification and claims, and upon considering in connection therewith the attached drawings to which they relate.

Referring now to the drawings, in which the same reference characters refer to the same parts throughout:

Figure 1 is a side elevation, partly in section, thru a suction cleaner constructed in accordance with the present embodiment of the invention;

Figure 2 is a bottom view of the cleaner shown in Fig. 1;

Figure 3 is a section upon the line 3—3 of Fig 2;

Figure 4 is a view looking in the direction of the arrows upon the line 4—4 of Fig. 2;

Figure 5 is a side view of a suction cleaner constructed in accordance with a second embodiment of the invention;

Figure 6 is a bottom view of the embodiment shown in Fig. 5;

Figure 7 is a section upon the line 7—7 of Fig. 6;

Figure 8 is a section upon the line 8—8 of Fig. 6;

The usual suction cleaner comprises a nozzle and suction-creating means which are operatively connected thereto. The nozzle and the means are movably mounted and are adapted to be propelled over the surface-covering undergoing cleaning. In operation the suction-creating means draw cleaning air through the nozzle, lifting the surface covering up into contact with the nozzle lips, and also into contact with the agitator positioned within the nozzle where such an element is provided. The inrushing air passes under the nozzle lips and also thru the surface covering removing the embedded foreign matter from the covering, and the matter dislodged by the agitator, and depositing it within a filtering bag. The filter or dust bag is commonly connected at its lower end to the exhaust outlet of the suction-creating means, and at its upper end to the cleaner handle which is normally pivoted to the body of the machine. The usual dust bag is made of cloth and in the normal relationship existing between the cleaner parts in a common cleaner, that is, the handle pivoted to a rigid body comprising the nozzle, fan chamber and motor, is perfectly satisfactory. This is true because the cloth bag is adapted to withstand strains and stresses imposed as the handle, carrying the upper end of the bag, pivots relative to the cleaner exhaust outlet to which, as stated, the lower end of the bag is attached.

Paper bags have been found to be desirable as their low cost makes feasible their destruction when filled with foreign material, thereby rendering unnecessary the distasteful cleaning operation required with the cloth dust bag. Paper bags, however, when used with the common machine described above, have been found to be of relatively short life, due to the bending taking place at their point of attachment to the cleaner exhaust outlet. With a view to making the use of paper dust bags completely satisfactory the present suction cleaner has been invented, and presents a relationship of parts in which no movement takes place between the exhaust outlet of the cleaner and the pivoted handle. Accordingly no bending movement takes place at any part of the dust bag as the bag is connected only to the

handle and to the outlet. The specific construction of the invention is hereinafter fully set forth.

Referring again to the drawings, and to Figures 1 to 4, inclusive, in particular, a preferred embodiment of the invention is disclosed. The cleaner nozzle 1 is provided with front and rear surface-contacting lips 2 and 3, as in the usual cleaner. Two passageways 4 and 5, formed integrally with the nozzle, extend rearwardly from the nozzle mouth, defined by the lips 2 and 3, the passageway 4 opening directly to the eye 6 of the fan chamber 7, while the passageway 5 extends to a point at the opposite end of the motor shaft and encloses belt-driving pulley 9. Both passageways are provided with removable cap members 10, 10 at their ends.

The nozzle 1 is provided with rearwardly extending rigid arms forming a frame 11. The nozzle frame is movably supported upon spaced pairs of front and rear wheels 12, 12 and 13, 13, the former being provided with height-adjusting means 14 so that they can be raised or lowered relative to the nozzle and frame for the purpose of raising and lowering the nozzle lips relative to the surface covering undergoing cleaning.

As in the usual suction cleaner a rotary agitator 15 is positioned within the cleaner nozzle and is adapted to contact the surface covering between the nozzle lips 2 and 3. Agitator 15 includes the usual rigid beating elements and flexible brush elements, and is provided with a pulley 16 opposite the passageway 5, which receives a belt 17 extended through that passageway to the driving pulley 9.

The fan chamber 7, which houses the rotating fan 7*a*, is seen to be formed integrally with the outer motor casing 18 and the two elements, together with the fan chamber exhaust outlet 19, are rotatably mounted upon an axis coincident with the motor axis by their side walls 21, 21 which rotatably seat upon the circular flanges 20, 20 formed upon the inner walls of the passageways 4 and 5 suitable seals 22, 22 being provided to render the joints air tight. False side members 23, 23 are carried by the passageways 4 and 5 and are formed with flanges at peripheries which extend into circular channels 24, 24 to cover the sealed joint completely, and to improve the appearance of the machine.

The outer side wall of the fan chamber 7 is formed, as stated, by a removable side member 21. The inner wall is formed integrally and extends inwardly to enclose fixedly in sealed relationship the casing proper 25 of the motor 8, the end wall of the casing 25 completing the side wall of the chamber. The outer or false casing 18 is not in fact the real motor casing, but serves to enclose the motor with a surrounding body of the same diameter 95 the fan chamber 7 thereby enhancing the appearance of the machine. No movement takes place between the motor casing 25 and the surrounding false casing 18 or the fan chamber 7, the casing 25 being carried by the inner wall of the fan chamber and by supporting lugs 26, 26 formed on the outer casing.

The motor armature 27, the extended shaft 28 of which carries the fan 7*a*, is carried by that shaft which is itself rotatably mounted at its ends in the end walls of the casing 25 upon ball bearings, one of which is indicated at the belt end of the machine at 29. At that end of the machine the enclosing wall 21 is sealed to the outer surface of the bearing to complete the passageway 5 and to prevent leaks at that point into the nozzle through the passageway.

The cleaner handle is fixedly carried by the outer motor casing 18 in a rearwardly opening socket 30 formed integrally thereon. The handle is indicated by the reference character 31 and is removably secured in the socket 30 by means of a screw pin 32 as in the usual cleaner construction. The incoming power leads 33, 33 extend down the handle and enter the motor casing through the socket 30 and are suitably connected. The cleaner dust bag, as indicated at 34, is formed of a suitable filtering material, preferably paper. The bag, together with its interior valve 35 which prevents foreign matter falling back into the exhaust outlet 19, is carried by an attachment ring 36 which is suitably secured to the exhaust outlet 19 by means of manually operable nut members 37, 37.

To control the pivotal position of the handle and to limit its movement within definite arcs of angular rotation or movement, handle-position-controlling means are provided which, in the present instance, are mounted upon the outer motor casing 18 and upon the nozzle frame. The handle-positioning means comprise an arcuate member 38 and a spring-pressed roller detent 39 which rolls against the outer surface thereof. Arcuate sector 38 is provided with spaced seats of various extents upon its outer edge, and the spring force exerted upon the detent 39 is sufficient to prevent unintended rotation of casing 18 about its supporting axis, and accordingly of the handle 31, when the detent is seated within the various seats. The seats on the sector are so positioned that the handle is resistingly retained in an upright position and in a range between the vertical and the horizontal.

In the operation of this embodiment of the invention of the handle switch effects connection of operating electric current to the cleaner motor 8, resulting in the rotation of the suction-creating fan 7*a* within the fan chamber 7 and of the driving pulley 9. The rotation of pulley 9 results in the rotation of the agitator 15, which is connected thereto by the belt 17. The suction created by the fan 7*a* is effective through the air passageway 4 and across the nozzle 1, resulting in the lifting of the surface covering undergoing cleaning upwardly into contact with the nozzle lips 2 and 3 and with the rotating agitator therebetween. The agitator disturbs and dislodges the foreign matter from the surface covering and the inrushing air into the nozzle carries the foreign matter through the air passageway 4 to the fan chamber 7 and exhaust outlet 19, and deposits it within the dust bag 34, the air continuing through the bag to the exterior atmosphere. The propulsion of the cleaner back and forth across the surface covering by the operator, who grasps the upper end of the handle 31, naturally results in the pivotal movement of the handle relative to that part of the machine which remains in fixed relationship relative to the surface covering, that is, the nozzle 1 and the air passageways 4 and 5. As the handle 31 is fixedly and rigidly connected to the motor, the fan chamber and the exhaust outlet 19, the pivotal movement of the handle results also in the arcuate rotation or pivotal movement of these members about their supporting axes which, in the embodiment disclosed, are coincident and alined with the axis of the driving motor and fan. It is seen, therefore, that as the handle pivots it rotates the motor and fan casing upon their seats upon the flanges 20, 20 of the passageways 4 and 5. As the dust bag 34 is connected to the handle 31 and to the exhaust out-

let 19 and as the handle and outlet pivot as a unit relative to the nozzle, it is clear that no relative movement takes place between the various parts of the dust bag 34. This relationship makes possible the use of fabric in the dust bag which will not stand repeated strains and stresses.

Referring now to Figures 5 to 8 inclusive, a second preferred embodiment of the invention is disclosed. In the main this modification follows the broad outline of the first modification with certain definite exceptions. According to the present embodiment the motor 8, and its inner and outer casings 25 and 18, respectively, are fixedly secured to the belt-containing passageway 5. Accordingly the sealed joint permitting movement between the motor casing and the passageway 5 of the first modification has been eliminated. The fan chamber 7 is again rotatably mounted upon the circular seat 20 of passageway 4, the major axis of that seat being coincident with the axis of the motor and being suitably sealed relative to the fan chamber by seals 22. As the fan chamber rotates and the motor does not move, it is necessary to provide a sealed sliding joint between the fan chamber and the inner motor casing 25. This is done at 40 and the rotational movement of the fan chamber 7 takes place without corresponding movement in the motor and its casings. The handle socket 30 in this embodiment is carried directly by the exhaust outlet 19 of the fan chamber, and the handle is removably connected as in the first embodiment. The dust bag 34 is again removably secured to the exhaust outlet and is carried by that outlet and by the handle. As the handle is carried by the fan chamber the position-controlling means, comprising the arcuate sector 38 and the spring-pressed detent 39, have been positioned so that the sector is carried at the periphery and bottom of the fan chamber instead of on the outer motor casing as in the first embodiment.

In this embodiment of the invention, as the machine is pushed back and forth across the surface-covering, the handle pivots relative to the remainder of the machine and rotates the fan chamber about its axis. As in the first embodiment no relative movement takes place between the exhaust outlet 19 and the handle and accordingly no bending or strain is imposed upon or in the bag in the cleaner operation.

I claim:

1. In an on-the-floor-type suction cleaner, a nozzle adapted to move over a surface covering at a predetermined height relative thereto, a fan chamber and a motor casing, a fan in said chamber and a rotating element in said casing connected to said fan, the axis of said fan and said element extending at an angle to the direction of cleaner movement, said fan chamber and motor casing being mounted for pivotal movement relative to the nozzle about an axis extended in the same direction as said first mentioned axis and which passes through said chamber and casing, and a handle rigidly connected relative to said chamber and casing.

2. In a suction cleaner, a surface-contacting nozzle, means supporting said nozzle for movement upon a surface covering undergoing cleaning, a driving motor positioned with its axis horizontal and substantially perpendicular to the direction of movement of said nozzle, a fan chamber rotatably mounted relative to said nozzle for movement about an axis passing through itself, a fan on the extended end of the shaft of said motor and positioned in said chamber, and a handle rigidly connected to said chamber.

3. In a suction cleaner, a surface-contacting nozzle, means supporting said nozzle for movement upon a surface covering undergoing cleaning, a driving motor positioned with its axis extended transversely to the direction of movement of said nozzle, a fan chamber rotatably mounted relative to said nozzle and to the casing of said motor, said fan chamber being positioned at one end of said motor, a fan in said chamber mounted on the extended end of the shaft of said motor, and a handle connected to and movable angularly with said chamber.

4. In a suction cleaner, a nozzle, including rearwardly extending passageways, an agitator in said nozzle, a driving motor, the shaft of said motor extended into one of said passageways, power-transmitting means connecting said shaft to said agitator, a fan chamber open at its eye to a second of said passageways and positioned between said motor and said second passageway, a fan in said chamber, said fan chamber being rotatable about an axis coincident with the motor shaft and relative to the nozzle, an exhaust outlet on said chamber, a handle fixedly connected to said chamber, and a dust bag supported by said handle and connected to said exhaust outlet.

5. The construction recited by the preceding claim characterized in that the stator of said motor is rotatably mounted and rotates with said fan chamber as the handle is pivoted.

6. In an on-the-floor-type suction cleaner, a nozzle adapted to move over a surface covering, suction-creating means including a fan chamber, a fan, a motor casing, and a rotating element in said casing connected to said fan, the axis of said fan and said element extending in a horizontal plane at an angle to the direction of cleaner movement, said fan chamber and said motor casing being mounted for pivotal movement relative to the nozzle about an axis extended in the same direction as said first mentioned axis and which passes through said chamber and casing, a handle rigidly connected relative to said chamber and casing, and means to retain said suction-creating means and handle in certain angular positions relative to said nozzle.

7. In a suction cleaner, a surface-contacting nozzle, means supporting said nozzle for movement over a surface covering, a driving motor connected to said nozzle with its axis extended transversely to the direction of movement of said nozzle, a fan chamber connected at one end of said nozzle and rotatably mounted relative thereto about an axis extended in the direction of said motor axis, a fan on the extended end of the shaft of said motor positioned in said chamber, a dust bag connected to the exhaust outlet of said fan chamber, a handle rigidly connected to and movable angularly with said chamber, and cooperating means on the unit comprising said motor and nozzle and on the unit comprising said chamber and handle to control the angular position of said chamber and handle.

8. In an on-the-floor-type suction cleaner, a nozzle, an agitator at said nozzle, a driving motor positioned with its shaft extended transversely to the direction of cleaner movement, power-transmitting means connecting said motor shaft to said agitator, a fan chamber having an exhaust outlet and connected interiorly to

said nozzle and rotatable relative thereto about an axis extended in the direction of said motor shaft, a handle connected to said chamber and adapted to pivot as said chamber rotates, and a dust bag connected to the exhaust outlet of said chamber.

9. In a suction cleaner, a nozzle including an air passageway having a normally covered opening, a driving motor, a fan chamber with its eye open to said passageway near said opening, said fan chamber being rotatable relative to the nozzle about an axis extended in the direction of the axis of said motor, said eye being alined with said opening in at least one position of said fan chamber, a fan in said chamber connected to the shaft of said motor, and a handle fixedly connected to said chamber, the cover of said opening being removable to receive a dusting tool connection.

10. The construction recited by the preceding claim characterized in that said opening and said fan chamber eye are alined so that a dusting tool connection inserted through the former can seat directly on the latter, there being means to prevent unintended rotation of said fan chamber.

11. A suction cleaner including a transversely extending suction nozzle and a motor and fan having transversely extending axes, means supporting said nozzle in operative relationship relative to a supporting surface the said motor including a rotor and a stator, a casing enclosing said stator, a fan chamber enclosing said fan and interiorly connected to said nozzle, said chamber and said casing connected rigidly as a unit which is rotatable relative to the nozzle about a transverse axis, dust-separating means connected to the exhaust outlet of said chamber, and a handle connected to said unit for movement therewith.

12. In a suction cleaner, a nozzle, means supporting said nozzle for movement over a surface covering, a driving motor including a casing connected to said nozzle with its horizontal axis extended transversely to the direction of movement of said nozzle, a fan on the extended end of the shaft of said motor, a fan chamber housing said fan and interiorly connected to said nozzle and movable relative thereto, said fan chamber being formed with an exhaust outlet and a passageway leading thereto which expands axially of said motor and adjacent its casing, a dust bag connected to said exhaust outlet, and a handle connected to and movable with said fan chamber.

13. The construction recited in the preceding claim in which said fan chamber is movable relative to said motor casing and said axially expanding passageway extends therearound.

14. In a suction cleaner, a surface-contacting nozzle, means supporting said nozzle for movement upon a surface covering undergoing cleaning, a driving motor with its axis horizontal and substantially perpendicular to the direction of movement of said nozzle, a fan chamber rotatably mounted relative to said nozzle for movement about an axis passing through itself and in the same horizontal plane as said first mentioned axis, a fan on the extended end of the shaft of said motor and positioned in said chamber, and a handle rigidly connected to said chamber.

15. In a suction cleaner, a surface-contacting nozzle, means supporting said nozzle for movement upon a surface covering undergoing cleaning, a driving motor positioned with its axis horizontal and substantially perpendicular to the direction of movement of said nozzle, a fan chamber mounted for movement relative to the nozzle about an axis passing through itself, a joint at the eye of said chamber sealing said chamber relative to said nozzle and permitting relative movement therebetween, a fan on the extended end of the shaft of said motor and positioned in said chamber, and a handle connected to said chamber and movable therewith.

16. In an on-the-floor type cleaner, a nozzle, a driving motor positioned with its shaft extended transversely to the direction of cleaner movement, a fan chamber having an exhaust outlet and connected interiorly to said nozzle and rotatable relative thereto about an axis extended in the direction of said motor shaft, a handle connected to the exhaust outlet of said fan chamber and adapted to move therewith and to exert a moving force therethrough, and a dust bag connected to said outlet.

17. In a suction cleaner, a surface-contacting nozzle, means supporting said nozzle for movement upon a surface covering undergoing cleaning, a driving motor positioned with its axis horizontal and substantiallly perpendicular to the direction of movement of said nozzle, a fan chamber including an exhaust outlet rotatably mounted relative to said nozzle for movement about an axis passing through itself, a fan on the extended end of the shaft of said motor and positioned in said chamber, a dust bag connected to the exhaust outlet of said chamber, a cleaner-actuating handle fixedly connected to said chamber and supporting said bag, said chamber, handle and bag being movable as a unit relative to said nozzle.

18. In an on-the-floor type suction cleaner, a nozzle including a transversely extending mouth portion having a rearwardly extending passageway at one side, a fan chamber and a motor casing having transversely extending axes in a horizontal plane, a sealing joint rotatably connecting said chamber to said passageway in the rear of said mouth portion of said nozzle, a motor in said motor casing with its shaft extended into said fan chamber, a fan on said shaft in said chamber, and a handle connected for movement with said fan chamber relative to said nozzle.

19. In a suction cleaner, a nozzle including rearwardly extending passageways at its ends, an agitator in said nozzle, a driving motor including a casing, rotor and stator, said motor casing being sealed to one of said passageways and said rotor being extended therein, power-transmitting means extended in said one passageway connecting said rotor to said agitator, a fan chamber positioned between said motor casing and a second passageway and rotatably sealed to the latter by a joint at the chamber eye, a fan in said chamber on the extended motor rotor, and a handle connected to said fan chamber for movement upon the rotation thereof.

20. The construction recited in the preceding claim in which said motor casing is rotatably connected by a sealing joint to said one passageway, and said chamber and casing move as a unit.

21. In a suction cleaner, a casing including a nozzle adapted for movement over a supporting surface, a fan, a second casing including a fan chamber enclosing said fan and mounted for pivotal movement upon said first casing about a horizontal axis extended through said fan cham-

ber, in the direction of the fan axis, and perpendicular to the direction of cleaner movement, an operating handle for said cleaner connected to and movable with said second casing, and a dust bag connected to said fan chamber and to said handle and movable therewith as a unit.

22. In a suction cleaner, the combination of a wheeled casing having a nozzle extending transversely to the normal direction of movement of the cleaner, a cylindric housing pivotally mounted upon said casing with its axis horizontal and parallel with said nozzle, a motor driven fan mounted within said housing, the latter having an inlet passage communicating with said nozzle and an exhaust outlet integral therewith, a handle mounted rigidly on said housing and a dust collecting receptacle connected at one end with said outlet and supported at its opposite end by said handle.

23. In a suction cleaner, the combination of a casing supported on wheels adjacent its front and rear end, and having a transversely extending nozzle, a cylindric housing pivotally mounted on said casing intermediate said front and rear wheels with its axis horizontal and parallel with said nozzle, a motor driven fan mounted axially of said housing, a portion thereof including said fan and forming a fan chamber communicating with said nozzle and having a radially disposed exhaust outlet integral therewith, a handle rigidly mounted on said housing adjacent said exhaust outlet, and a dust collecting receptacle connected at one end with said exhaust outlet and supported at its opposite end by said handle.

24. A vacuum cleaner comprising a suction chamber, means supporting said chamber for movement over a surface to be cleaned, said suction chamber having a rearwardly and upwardly extended throat, a fan case having its inlet hinged to said throat, a fan in said fan casing, a motor for driving said fan, a handle attached to the fan casing for pushing the suction chamber, and a dust collecting bag suspended beneath the handle, said bag having an inlet neck attached to the outlet of the fan casing, said handle, bag and fan casing attached to swing as a unit around the axis of said motor which axis is parallel to the longitudinal axis of the suction chamber and transverse to the direction of the cleaner movement.

25. A suction cleaner including a transversely extending suction nozzle and a motor and fan having horizontal transversely extending axes, the said motor including a rotor and a stator, a fan chamber enclosing said fan and interiorly connected to said nozzle, said chamber being rotatably mounted relative to the nozzle for movement about the fan axis, and a handle connected to said chamber and movable therewith and in a vertical plane.

26. In a vacuum cleaner, a suction chamber, a motor mounted thereon, its axis horizontal and transverse to the direction of cleaner travel, a fan case mounted for swinging movement around the axis of said motor, a handle rigidly attached to said fan case, said suction chamber having an outlet throat and said fan case having an inlet neck, said throat and neck having arcuate portions disposed circumferentially with respect to said motor axis and telescopically engaged with each other to allow said handle to move up and down while maintaining a closed air passage from said suction chamber to said fan case.

27. A suction cleaner including a transversely extending suction nozzle, a suction-creating fan rotatable about an axis extended transversely to the direction of cleaner movement, a fan chamber enclosing said fan, interiorly connected to said nozzle, and rotatable relative to said nozzle about an axis through itself extended transversely to the direction of cleaner movement, a driving motor connected to said fan, and a handle connected to said chamber and rotatable therewith and in a vertical plane.

28. A suction cleaner including a transversely extending suction nozzle, an air passageway connected to said nozzle, a suction-creating fan rotatable about a horizontal axis extended transversely to the direction of cleaner movement, a fan chamber enclosing said fan, and rotatably connected to said passageway about an axis through itself extended transversely to the direction of cleaner movement, a driving motor connected to said fan, and an operating handle connected to said chamber and rotatable therewith.

29. A suction cleaner comprising an ambulatory nozzle unit including a nozzle and an air passageway connected thereto, a fan chamber unit including a fan chamber mounted on said nozzle unit for pivotal movement about the fan axis transversely to the direction of cleaner movement, and interiorly connected to said passageway, a handle rigidly connected to said fan chamber unit extended perpendicularly to said axis and adapted to pivot with said unit, said air passageway including displaceable means between said nozzle and fan chamber and adapted to be interrupted to convert said cleaner from an on-the-floor cleaner to an off-the-floor cleaner.

30. A suction cleaner comprising an ambulatory nozzle unit including a nozzle and an air passageway connected thereto, a fan chamber unit including a fan chamber mounted on said nozzle unit for pivotal movement about the fan axis, transversely to the direction of cleaner movement, and interiorly connected to said passageway, a handle rigidly connected to said fan chamber unit extended perpendicularly to said axis and adapted to pivot with said unit, said air passageway having an opening therein and a member removably covering said opening to give entrance to said fan chamber unit.

CHANDOS BURKHARDT.