

Aug. 29, 1961

E. GAUDRY
VACUUM CLEANER

2,997,728

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3 Sheets-Sheet 1

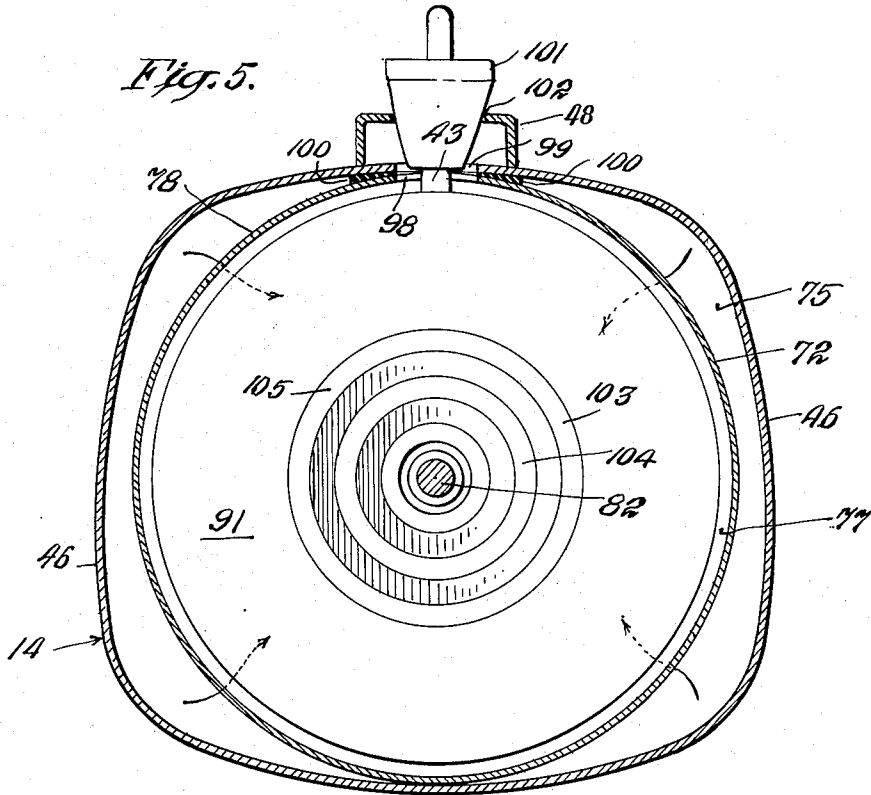
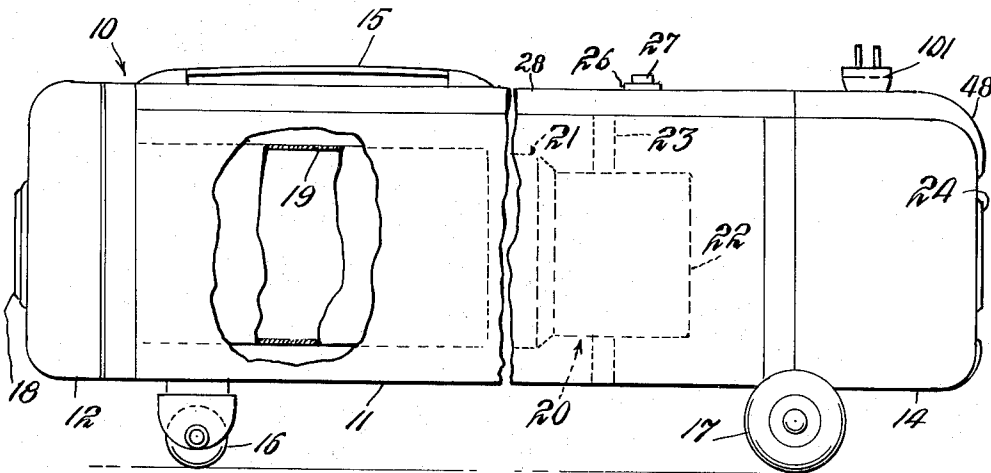


Fig. 1.

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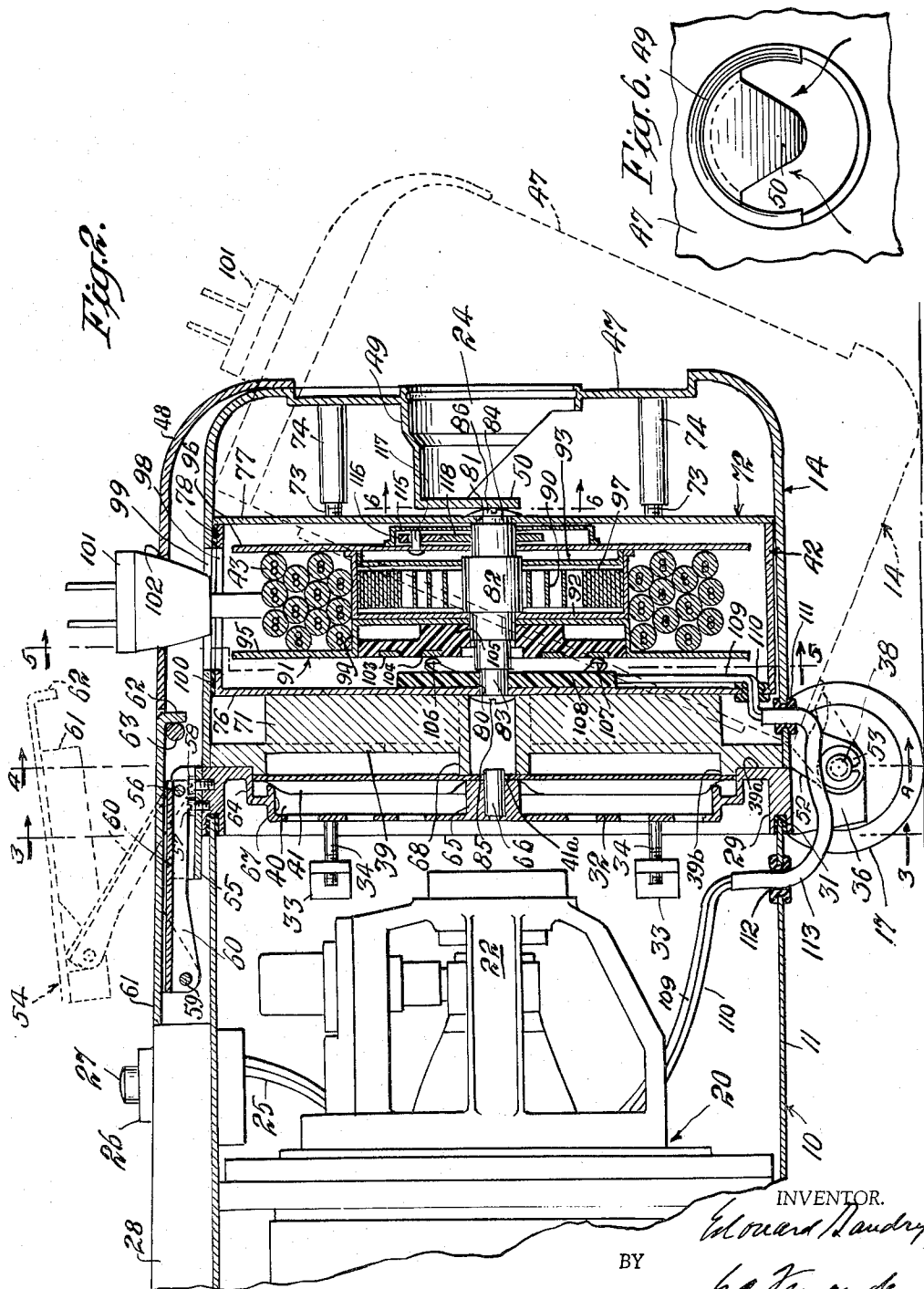
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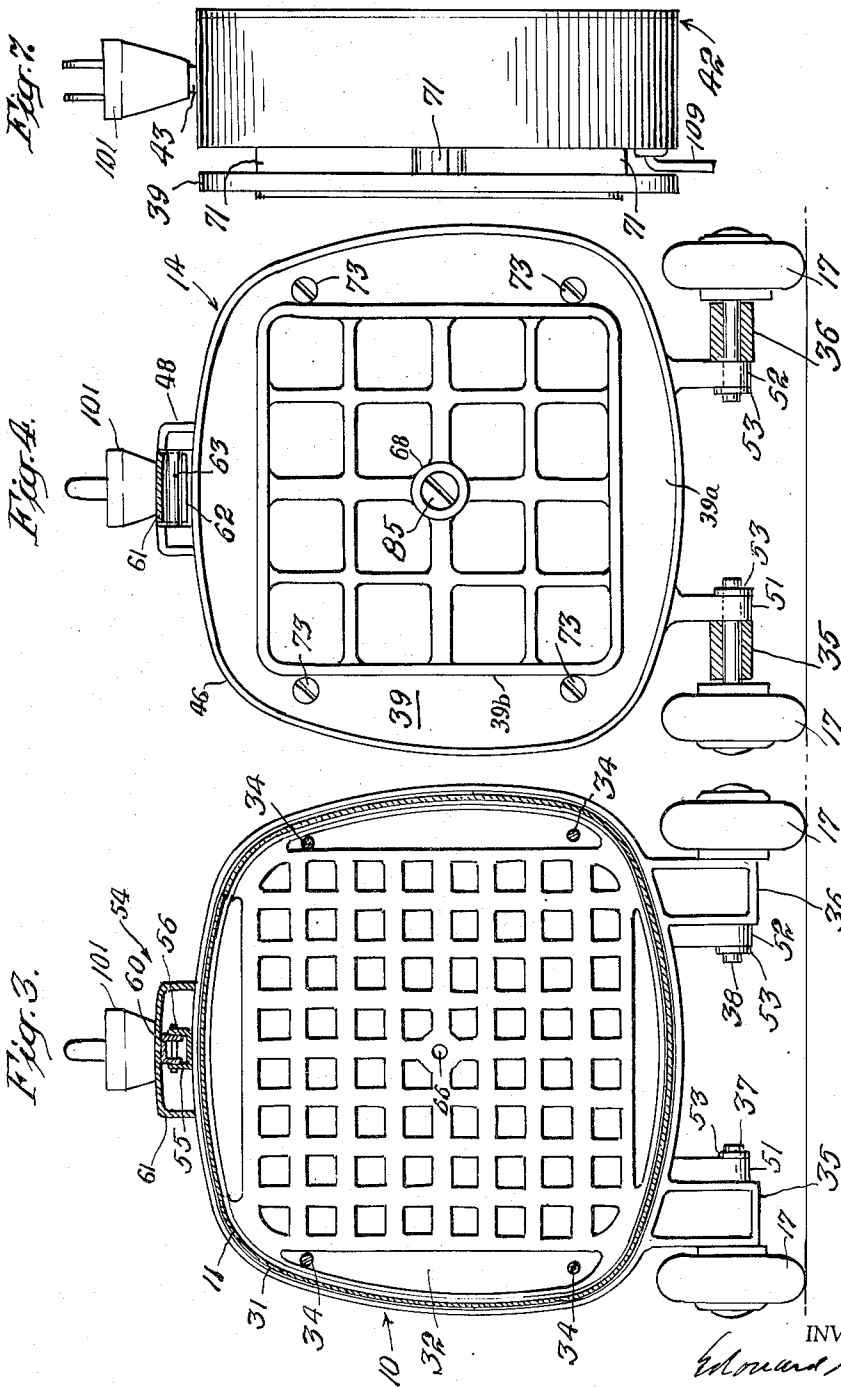
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3 Sheets-Sheet 3



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VACUUM CLEANER

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5 Claims. (Cl. 15—323)

The present invention relates to suction cleaners and more particularly to an improved construction in tank type cleaners.

Suction cleaners of the type indicated comprise a tubular casing having air inlet and outlet openings at its opposite ends and a motor-fan unit therein for propelling air therethrough. A removable dust bag is located in the casing adjacent the air inlet end for separating the entrained dust and dirt from the air flowing through the casing. In addition such vacuum cleaners usually have a filter pad adjacent the air outlet end of the casing to insure removal of any fine dust particles which may have passed through the dust bag before the air is discharged into a room. The filter pad also may be used as a carrier to diffuse an essence into the outgoing air stream to produce a pleasing scent in the room.

In such prior constructions the filter pad is mounted in the cleaner adjacent the rearward end cover of the cleaner casing. When a filter pad is to be changed or an essence applied to the pad, it is necessary to remove screws and completely detach the end cover. The average housewife finds it a nuisance and something of a chore to remove and replace the end cover. This is especially true because of the necessity of aligning the holes in the detached cover and casing and inserting the attaching screws in an awkward position adjacent the floor. As a result, the filter pads are not replaced as frequently as they should be to insure complete removal of dust from the air stream. Furthermore, the desirable function of the filter pad to diffuse an essence into the air in a room is not utilized.

An object of the invention is to provide a suction cleaner of the type indicated in which the end cover of the casing is pivotally mounted and clamped in closed position by a quick releasable latch to facilitate opening and closing the casing by merely swinging the end cover on its pivotal mounting.

Another object is to provide an improved suction cleaner of the type indicated which is of relatively simple and compact construction to adapt it for economical manufacture and one which is reliable in operation.

These and other objects will become more apparent from the following description and drawings in which like reference characters denote like parts throughout the several views. It is to be expressly understood, however, that the drawings are for the purpose of illustration only and not a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings:

FIGURE 1 is a side elevational view of suction cleaner incorporating the novel features of the present invention;

FIGURE 2 is an enlarged longitudinal sectional view of the rearward end of the suction cleaner illustrated in FIGURE 1 to show the pivotally mounted end cover to provide access to the filter pad and cord reel;

FIGURE 3 is a transverse sectional view taken on line 3—3 of FIGURE 2 to show the reticulated perforate plate at the end of the tubular portion of the cleaner casing;

FIGURE 4 is a transverse sectional view taken on line 4—4 of FIGURE 2 to show the cooperating reticulated perforate plate in the end cover;

FIGURE 5 is a transverse sectional view taken on line 5—5 of FIGURE 2 to show the space between the outer

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periphery of the reel and casing to provide a passage for the flow of air therebetween;

FIGURE 6 is a transverse sectional view taken on line 6—6 of FIGURE 2 to show the abutment at the forward inwardly projecting end of the bracket surrounding the air outlet opening; and

FIGURE 7 is a side elevational view of the reel unit.

Referring to FIGURE 1 of the drawings, the invention is shown applied to a horizontal tank type suction cleaner 10 comprising a casing 11 having a central section, a front end cover 12 and a rear end cover 14. Casing section 11 is provided with a handle 15 and wheels 16 and 17 to facilitate movement thereof on a supporting surface, a single wheel 16 at the front of the casing being centrally disposed and mounted to turn about a vertical axis as a caster as well as rotate about a horizontal axis.

The front end cover 12 is removably secured to the casing in any suitable manner and formed with an inlet opening 18 to which a suction hose (not shown) is adapted to be detachably connected. Suitable cleaning appliances may be connected to a wand which, in turn, is connected to the outer free end of the suction hose and to which air flows into the casing. An air permeable dust bag 19 is located in the casing 11 adjacent the front end cover 12 in which dirt is separated from the air and collected.

Flow of air through casing is effected by a motor and fan unit 20 which includes a centrifugal fan 21 arranged at one end of an electric motor 22 resiliently mounted in any suitable manner at 23 within the casing 11. The fan 21 receives the air which has passed through the dust bag 19 and is substantially free of dust and dirt, such air being discharged from the fan through the motor 22 and eventually passing through the outlet opening 24 in the rear end cover 14. Motor 22 is connected by conductors 25 to an electric switch 26 which is arranged to be actuated by a push button 27 located in a trim strip 28 at the top of the casing 11.

The casing section 11 is provided with an end ring 29, see FIGURE 2, having a groove in its forward face which extends around the entire periphery thereof and into which the rearward end of the tubular casing section projects, the latter being embedded in suitable sealing material 31 to provide an air tight joint and prevent vibration. A transverse perforate plate 32, which may be formed integrally with the end ring 29 is disposed at the end of casing section 11 adjacent the motor 22. The end ring 29 and transverse perforate plate 32 may be secured to the casing 11 in any suitable manner. As shown in FIGURE 2, the ring 29 and plate 32 are cast in an integral structure with centrally located cross ribs forming a reticulated grid and the integral structure is attached to brackets 33 on the inner wall of casing section 11 by means of fastening screws or bolts 34 passing through openings in the plate and screwed into the brackets.

The end ring 29 is formed with depending bearing brackets 35 and 36, see FIGURES 2 and 3, in which laterally projecting stub shafts 37 and 38 are mounted and project from their opposite sides. Wheels 17 are rotatably mounted on the outwardly projecting ends of the stub shafts 37 and 38. As shown in FIGURE 3, the shafts 37 and 38 have enlarged heads for engaging the sides of the wheels and the bearing brackets have spaced walls to provide a wide bearing surface.

In accordance with the present invention the end cover 14 is pivotally mounted on the casing section 11 to adapt the end of the casing to be easily and quickly opened and closed without detaching the end cover. Transverse plate 32 at the end of the casing section 11 and a cooperating transverse plate 39 on the cover 14 are constructed to form a chamber 40 therebetween for mount-

ing a filter pad 41. In addition, the end cover 14 mounts a reel 42 for an electric cord 43 as a detachable unit. Thus, the pivotally mounted end cover 14 provides an easy and quick access to the filter pad 41 and reel unit 42 for service, replacement or repair of parts.

As shown in FIGURES 2 and 5, the end cover 14 has a tubular portion 46 of a shape corresponding to the shape of casing section 11, a rearward end wall 47 and a top trim strip 48. The air outlet opening 24 is located centrally in the end wall 47 and a semi-circular bracket 49 surrounding the opening. Bracket 49 has a centrally positioned abutment 50 spaced inwardly from the end wall 47 to provide a path of flow to the air outlet opening 24. Depending from the bottom of the end cover 14 adjacent its forward end are spaced lugs 51 and 52 through which the inwardly directed ends of the stub shafts 37 and 38 project to pivotally mount the end cover for rocking movement toward and away from the opened end of the casing section 11. The stub shafts 37 and 38 are held in position by means of spring clips 53 engaged in annular slots in the inner ends of the shafts.

The pivotally mounted end cover 14 is clamped in closed position at the end of the casing section 11 by means of a toggle latch 54 as shown in FIGURES 2 and 3. Latch 54 comprises a U-shaped housing 55 attached to the top of end ring 29 by means of screw connections 57 and 58, as shown in FIGURE 2. A link 60 has one end pivotally connected by a pin 56 to housing 55 and its other end pivotally connected by a pin 59 to one end of a second link 61. The free end of the link 61 has a latching flange 62 engaging a keeper 63 in the trim strip 28 on the cover 14. The articulated members 60 and 61 are of U-shape in cross-section and so dimensioned that the member 60 is adapted to fold into and frictionally engage the inner faces of the sides of the latch housing 55 and the member 61 is adapted to fold over the latch housing, as best shown in FIGURE 3. Thus, the latch 54 may be extended to engage the latching flange 62 with the keeper 63 and the articulated links 60 and 61 folded one within the other to draw and clamp the cover 14 against the end ring 29 of casing 11.

As shown in FIGURE 2, the perforate transverse plate 32 is offset to the left from the outer face of the ring 29. Also, plate 32 has an annular part 64 extending lengthwise of casing 11 which provides a frame defining the outer periphery of the chamber 40 in which the filter pad 41 is positioned. A centrally positioned boss 65 projects rearwardly from plate 32 and mounts a centering pin 66 for positioning the filter pad 41 centrally in the chamber. The filter pad 41 is of a generally rectangular shape corresponding to the shape of chamber 40 to cover openings in the reticulated grid and has a central opening 41a for mounting it on the pin 66. Filter pad 41 also is of such dimensions as to be located and positioned within the annular locating frame or part 64. The transverse plate 39 in the open end of the cover 14 is of a construction similar to plate 32 having a peripheral contour corresponding to the tubular portion 46 of the cover 14 and a rearwardly offset and centrally located perforate grid portion. As shown in FIGURE 2, the peripheral rim 39a of plate 39 engages the outer face of ring 29 and a forwardly projecting annular flange 39b cooperates with flange 67 on apertured plate 32 to clamp the flattened peripheral edge of the essentially flat filter pad 41 therebetween within the frame 64. An axial sleeve 68 extends through plate 39 and projects forwardly therefrom to engage filter pad 41 and hold it against the end of boss 65 on plate 32.

Thus, the apertured plates 32 and 39 include structure for removably holding the filter pad 41 in a predetermined position on one of the apertured plates 32 and 39 with the rear end cover 14 in open position and for holding the filter pad 41 about its periphery in airtight sealing relation with the apertured plates 32 and 39 along

a line defining a zone which is transverse to the longitudinal axis of the cleaner and is completely enveloped and concealed from view by the casing 10 and rear end cover 14 with the latter in closed position.

The filter pad 41 of rectangular form is placed on the apertured plate 32 when the rear end cover 14 is in open position. As best shown in FIGURE 2, the part 64 disposed about the periphery of apertured plate 32 and extending lengthwise of casing 11 forms a frame for locating and positioning the four sides of the filter pad 41 on the apertured plate 32. In its located position the filter pad 41 rests against flange 67 which extends about the periphery of the apertured plate 32. A central opening 41a in the filter pad receives the pin 66 projecting from apertured plate 32 to facilitate locating and positioning the filter pad.

The flange 39b, which extends longitudinally of the cleaner and is disposed about the periphery of apertured plate 39, engages the periphery of the filter pad 41 when the latter is positioned and located on the apertured plate 32 and the rear end cover 14 is in closed position. The axial sleeve 68 on apertured plate 39 serves as a pressure ring which cooperates with the pin 66 and is disposed about the latter and engages the filter pad 41 to seal the latter about the opening 41a when the rear end cover 14 is in closed position.

Perforated transverse plate 39 also constitutes part of a reel unit 42 for the electric cord 43. As shown in FIGURES 2 and 7, the reel unit comprises the perforated transverse plate 39, spacer ribs 71 at the rear of the plate and a reel housing 72 at the rear of the spacer. The spacers 71 are in the form of narrow ribs extending radially from the rearwardly projecting portion of sleeve 68 between rows of perforations at the rear of plate 39 and the ribs are rigidly attached to the plate or cast as an integral part thereof. In the illustrated embodiment, four of such rib spacers 71 are provided which are attached to the plate by means of lugs on the spacers extending through holes in the plate with peened ends. In like manner, the reel housing 72 is rigidly attached to the rearward faces of the spacers 71 to provide the self contained reel unit 42. The space between the plate 39 and reel housing 72 provides a passage for air flowing through the suction cleaner 10.

The reel unit 42 is detachably connected to the end cover 14 by means of fastening screws 73 extending through the transverse plate 39, see FIGURE 4, and screwed into threaded bosses 74 projecting inwardly from end wall 47 of cover 14, see FIGURE 3. When the screws 73 are tightened, they draw the reel unit 42 against the abutment 50 of bracket 49 to rigidly secure the unit in the cover.

As shown in FIGURE 4, the plate 39 has the same contour as and closely fits the interior of the tubular portion 46 of cover 14, while the reel housing 72 is of cylindrical form, see FIGURE 5. The reel housing 72 is of substantially the same diameter as the height of the tubular end cover, but of less width to provide a space 75 between the reel housing and tubular portion of the cover. Thus, air entering the end cover 14 flows axially through the perforations in the plate 39, radially outwardly between the plate 39 and reel housing 72, axially through the space 75 between the reel housing and tubular cover and then radially inwardly between the reel housing and end wall 47 to the outlet opening 24.

The cylindrical reel housing 72 comprising spaced side plates 76 and 77 and a peripheral wall 78. In the illustrated embodiment, side plate 76 and peripheral wall 78 are formed in integral structure permanently attached to the spacing ribs 71 and the side plate has an axial opening 80 surrounded by sleeve 68. Side plate 77 is formed as a separate element to provide a detachable cover for opening the reel housing 72 and has an axial opening 81 with flattened sides in alignment with the opening 80 in the opposite plate 76. An axial shaft

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82 having stepped diameters, see FIGURE 2, is located between the side plates 76 and 77 of the reel housing 72 and has reduced ends 83 and 84 with flattened sides projecting through the openings 80 and 81 in the spaced side plates 76 and 77 to prevent rotation relative to the housing. The shaft 82 is held in position and the side plate 77 is held in closed position on the reel housing 72 by means of screws 85 and 86 projecting through the openings 80 and 81 in plates 76 and 77 and screwed into tapped holes in the reduced ends of the shaft. Thus, the axial shaft 82 provides a fastening means for attaching the side cover plate 77 to the reel housing 72 and provides an arbor on which the reel spool turns.

In addition to providing a reel unit 42 mounted in a pivoted end cover 14 to provide easy access to and facilitate servicing and repair of the reel unit, the present invention provides a reel of novel construction which permits the use of a relatively short reel spring 90 having a more uniform torque characteristic throughout the winding range of the reel than the longer springs previously required. The improved construction of an electric cord reel in a suction cleaner for producing these improved results resides in the arrangement for winding the reel spring on shaft 82 having a relatively small diameter and winding the cord 43 on a spool 91 surrounding the spring and having a much larger diameter. Thus, a turn of cord 43 on spool 91 has a length many times greater than the length of a turn of the spring on the arbor shaft 82.

As shown in FIGURE 2, the reel spool 91 comprises spaced disks 92 and 93 having axial openings to closely fit adjacent stepped portions of shaft 82 on which it rotates. At the outer peripheries of the spaced disks 92 and 93 is a cylindrical barrel 94 of the reel spool 91 having radially projecting side flanges 95 and 96. In the illustrated embodiment, the reel spool 91 is made of a plurality of separate attached parts; one part comprising a disk portion, barrel portion and flange; another part having a disk portion attached to the first disk portion and a barrel portion projecting laterally from the barrel portion of the first part; another part constituting the disk 93 being attached to the barrel portion of the second part; and another part attached to the barrel portion and forming the other flange and extending inwardly to the shaft 82. Disk 93 rides on the central portion of shaft 82 of largest diameter while disk 92 rides on the adjacent reduced stepped portion and bears against the annular shoulder therebetween to resist axial thrust and properly center the reel spool 91 in the reel housing 72. The clock spring 90 is mounted in the annular space 97 between the spaced disks 92 and 93 and has its inner end attached to the shaft 82 and its outer end attached to the barrel 94 of the reel spool 91.

The electric cord 43 is wound on the reel spool 91 with its outer end extending through aligned openings 98 and 99 in the reel housing 72 and tubular portion 46 of the cover 14 and a gasket 100 is provided around the openings, see FIGURE 5, to prevent air leakage from the space 75. A tapered plug fitting 101 is provided at the outer end of cord 43 which is engageable with the sides of an opening 102 in the trim strip 28. The inner end of the electric cord 43 is attached to reel spool 91. Cord 43, of course, comprises a pair of insulated conductors and their inner ends are connected to slip rings 103 and 104 on the reel spool 91. As shown in FIGURE 2, the slip rings 103 and 104 are embedded in an insulating plastic disk 105 keyed to and rotatable as a unit with the disk 92 of the reel spool 91. Spring contacts 106 and 107 on the reel housing 72 engage the slip rings 103 and 104 on the reel spool 91 and produce an axial thrust which is resisted by the engagement of disk 92 with the shoulder on the stepped shaft 82. Spring contacts 106 and 107 are mounted on an insulating plate 108 surrounding a reduced portion of the stepped shaft 82 and engaged by the annular shoulder

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therebetween to clamp it to the side plate 76 of the reel housing 72. Electric conductors 109 and 110 are connected to the spring contacts 106 and 107 and extend outwardly through an opening 111 in the cover 14 and then inwardly through an opening 112 in the casing section 11 to provide a flexible loop 113 therebetween to permit pivotal movement of the cover relative to the casing section. The electrical conductors 109 and 110 are connected to the motor 22 through the switch 26 and conductors 25. Thus, during each revolution of the reel spool 91 a length of cord 43 is removed from the casing corresponding to the periphery of the wound cord at the outer diameter of the reel while relatively short lengths of the clock spring 90 are wound on the shaft 82 of relatively small diameter. This arrangement permits the use of a relatively short spring having more constant torque characteristics than is possible when the reel spool surrounds an air outlet tube.

A catch mechanism 115 is provided for holding the reel spool 91 when the cord 43 is extended. The catch mechanism 115 as shown in FIGURE 2 comprises a pawl 116 pivotally mounted on a pin 117 projecting from the side of disk 93 of the reel spool 91 and overlying the periphery of a notched disk 118 mounted fast on the shaft 82. When the cord 43 is reeled out, the pawl rides over the notches, but when released the pawl will engage one of a plurality of notches in the disk 118 to hold the cord extended. When it is desired to reel in the cord the cord is given a slight pull and released at which time the speed of rotation of the reel spool 91 throws the pawl away from the periphery of the disk by centrifugal force. One form of the invention having now been described in detail, the mode of operation is next explained.

The suction cleaner 10 incorporating the present invention is conveyed to the place where it is to be used in a conventional manner either by carrying it by the handle 15 or by propelling it on its wheels 16 and 17. The plug fitting 101 is pulled from the cover 14 to withdraw the electric cord 43 from the reel 42. When the required length of cord 43 has been withdrawn, the plug fitting 101 is inserted in an electric outlet socket.

An electrical connection is made from the separate prongs of the plug fitting 101 through the conductors in the cord to the slip rings 103 and 104. The connection is completed through the spring contacts 106 and 107 and conductors 109 and 110 to the motor 22 through switch 26. Thus, at any location of the cleaner 10 and during movement of the cleaner relative to the electrical outlet an electrical connection is maintained between the rotating reel spool 91 and fixed motor 22. Furthermore, the construction of the cord reel 42 permits the cord to be reeled out or reeled in with a more uniform pull to insure latching and releasing by the pawl 116 as required.

A hose (not shown) is inserted in the air inlet opening 18 in the front end cover 12 and the proper cleaning attachment applied to the end of the hose. Operation of the suction cleaner is initiated by depressing the push button 27 of the electric switch 26 to energize the motor fan unit 20. Air and dust is then drawn into the filter bag 19 where the dust and dirt is separated from the air and the air exhausted from the fan then flows through the perforations in the transverse plate 32 at the end of the casing section 11, filter pad 41 and perforations in the transverse plate 39 in the rear end cover 14. The air then flows outwardly between the transverse plate 39 and reel housing 72 held in spaced relation by the spacers 71, see FIGURE 2, and then axially through the space 75 between the reel unit 42 and tubular portion 46 of the cover 14 at the outer periphery of reel housing 72, see FIGURE 5, and is delivered to the room through the outlet opening 24 in the end wall 47 of the cover, see FIGURE 2.

When the filter pad 41 is to be replaced or treated with an essence or when the reel requires service or replacement, the casing 11 is easily and quickly opened by rocking the rear end cover 14 with respect to the casing section 11. This is accomplished by merely lifting the forward end of the toggle latch 54 to release the latching flange 62 from the keeper 63 on the cover 14 in the manner illustrated in dash lines in FIGURE 2. The end cover 14 then rocks forwardly on the pivot pins 38 to the position illustrated in dash lines and the loops 113 of conductors 109 and 110 flex to permit this relative movement. As the cover 14 is rocked away from the casing section 11, the peripheral ring portion of the transverse plate 39 moves away from the ring 29 to open the chamber 40. Filter pad 41 then may be removed and replaced or treated as desired.

Such rocking movement of the rear end cover 14 away from the casing section 11 also provides access to the reel unit 42 for servicing or repair. The reel unit may be removed by loosening the screws 73 and the reel unit may be disassembled by removing the screws 85 and 86.

After service or repair, the end cover 14 may be easily and quickly closed on the casing section 11 by merely rocking the end cover toward closed position, engaging the latching flange 62 with the keeper 63 and pressing the toggle portions of the latch into nested relationship. Because of the pivoted connections between cover 14 and casing section 11, the separable parts are brought into proper registering relationship so that no care need be given to aligning the parts, inserting screws or making any electrical connections. Furthermore, due to the pivotal connection of the end cover 14 with the casing section 11, the vacuum cleaner may be opened for service or repair without skill or dexterity due to the awkward position by the cleaner on the floor.

It will now be observed that the present invention provides an improved construction in a suction cleaner which facilitates access to the filter pad and cord reel for service or repair. It will also be observed that the present invention provides a suction cleaner which may be easily and quickly opened and closed without detaching an end cover from the casing. It will further be observed that the present invention provides an electric cord reel in an end cover of a suction cleaner casing which requires a reel spring having only a fraction of the length and improved torque characteristics over the cord reels previously used. It will still further be observed that the present invention provides a suction cleaner of the type indicated having a relatively simple and compact construction to adapt it for economical manufacture and one which is reliable in operation.

While a single embodiment of the invention is herein illustrated and described it will be understood that changes may be made in the construction and arrangement of elements without departing from the spirit or scope of the invention. Therefore, without limitation in this respect, the invention is defined by the following claims:

I claim:

1. In a suction cleaner, an elongated casing having at opposite ends thereof front and rear end covers provided with an air inlet and outlet, respectively, means in the casing for moving air therethrough from the inlet to the outlet, at least a part of the rear end cover being of cup-like shape and having the outlet at its closed end and an apertured plate mounted at its opposite open end from which air flows to the outlet, means for pivotally mounting the rear end cover for rocking movement at one end of the casing, an apertured plate fixed to the one end of the casing, the apertured plates forming a chamber therebetween with the rear end cover in closed position, an essentially flat filter pad of rectangular form having an opening therein, the apertured plates including structure for removably holding the pad in a predetermined position on one of the apertured plates with the rear end cover in

open position and for holding the pad about its periphery in airtight sealing relation with the apertured plates along a line defining a zone which is transverse to the longitudinal axis of the cleaner and is completely enveloped by the casing and rear end cover with the latter in closed position, and a releasable fastening means for latching the pivoted rear end cover in closed position and releasing the latter for rocking movement from closed position for quick and easy access to the removable filter pad, the filter pad holding structure comprising means on one of the apertured plates for locating and positioning the four sides of the filter pad thereon, the opening in the filter pad receiving a pin projecting from the one apertured plate when the filter pad is placed on the latter to facilitate locating and positioning the filter pad, the other apertured plate having a flange of rectangular form at its periphery which extends longitudinally of the cleaner and engages the periphery of the filter pad when the latter is positioned and located on the one apertured plate and the rear end cover is in closed position, the other apertured plate also having a pressure ring which cooperates with the pin and is disposed about the latter and engages the filter pad to seal the latter about the opening when the rear end cover is in closed position.

2. In a horizontal tank-type suction cleaner, an elongated casing having at opposite ends thereof front and rear end covers provided with an air inlet and outlet, respectively, means in the casing for moving air therethrough from the inlet to the outlet, means including wheels for supporting the cleaner for movement on a surface, the supporting means including spaced apertured lugs depending downward from the casing and pins held thereon upon which the wheels are mounted for movement about axes normal to the longitudinal axis of the casing, at least a part of the rear end cover being of cup-like shape and having the outlet at the closed end and an apertured plate mounted at its opposite open end from which air flows to the outlet, means for pivotally mounting the rear end cover for rocking movement at one end of the casing, the pivotal mounting means including apertured lugs which depend downward from the rear end cover and are mounted for movement on the pins, an apertured plate fixed to the one end of the casing, the apertured plates forming a chamber therebetween with the rear end cover in closed position, an essentially flat filter pad of rectangular form having an opening therein, the apertured plates including structure for removably holding the pad in a predetermined position on one of the apertured plates with the rear end cover in open position and for holding the pad about its periphery in airtight sealing relation with the apertured plates along a line defining a zone which is transverse to the longitudinal axis of the cleaner and is completely enveloped by the casing and rear end cover with the latter in closed position, and a releasable fastening means for latching the pivoted rear end cover in closed position and releasing the latter for rocking movement from closed position for quick and easy access to the removable filter pad, the filter pad holding structure comprising means on one of the apertured plates for locating and positioning the four sides of the filter pad thereon, the opening in the filter pad receiving a pin projecting from the one apertured plate when the filter pad is placed on the latter to facilitate locating and positioning the filter pad, the other apertured plate having a flange of rectangular form at its periphery which extends longitudinally of the cleaner and engages the periphery of the filter pad when the latter is positioned and located on the one apertured plate and the rear end cover is in closed position, the other apertured plate also having a pressure ring which cooperates with the pin and is disposed about the latter and engages the filter pad to seal the latter about the opening when the rear end cover is in closed position.

3. In a horizontal tank-type suction cleaner, an elongated casing part having at opposite ends thereof front

and rear end cover parts provided with an air inlet and outlet, respectively, means in the casing for moving air therethrough from the inlet to the outlet, at least a portion of the rear end cover being of cup-like shape and having the outlet at its closed end and an apertured plate mounted at its opposite open end from which air flows to the outlet, means for pivotally mounting the rear end cover for rocking movement at one end of the casing at the vicinity of the bottom thereof, an apertured plate fixed to the one end of the casing, the apertured plates forming a chamber therebetween with the rear end cover in closed position, an essentially flat filter pad of rectangular form having an opening therein, the apertured plates including structure for removably holding the pad in a predetermined position on one of the apertured plates with the rear end cover in open position and for holding the pad about its periphery in airtight sealing relation with the apertured plates along a line defining a zone which is transverse to the longitudinal axis of the cleaner and is completely enveloped by the casing and rear end cover with the latter in closed position, the filter pad holding structure comprising means on one of the apertured plates for locating and positioning the four sides of the filter pad thereon, the opening in the filter pad receiving a pin projecting from the one apertured plate when the filter pad is placed on the latter to facilitate locating and positioning the filter pad, the other apertured plate having a flange of rectangular form at its periphery which extends longitudinally of the cleaner and engages the periphery of the filter pad when the latter is positioned and located on the one apertured plate and the rear end cover is in closed position, the other apertured plate also having a pressure ring which cooperates with the pin and is disposed about the latter and engages the filter pad to seal the latter about the opening when the rear end cover is in closed position, and a quick releasable fastening means at the top of the cleaner for latching the pivoted rear end cover part in closed position at the one end of the casing part and releasing the latter for rocking movement from closed position for quick and easy access to the removable filter pad, said quick releasable fastening means comprising a latch having a latch keeper on one of the parts and a plurality of articulated links connected to the other part, a catch on one of the articulated links for engaging the keeper on the one part, and the articulated links being foldable into nested relation to clamp the casing part and rear end cover part together.

4. In a suction cleaner, an elongated casing having at opposite ends thereof front and rear end covers provided with an air inlet and outlet, respectively, means in the casing for moving air therethrough from the inlet to the outlet, at least a part of the rear end cover being of cup-like shape and having the outlet at its closed end and its opposite end open, a reel for an electrical cord mounted in the rear end cover, an apertured plate, means for detachably mounting the plate at the open end of the rear end cover, means for pivotally mounting the rear end cover for rocking movement at the one end of the casing, the apertured plate being disposed transverse to the longitudinal axis of the casing with the rear end cover in closed position, an apertured plate which is transverse to the longitudinal axis of the casing and fixed to the one end thereof, the apertured plates forming a chamber therebetween with the rear end cover in closed position, an essentially flat filter pad of rectangular form having an opening therein, the apertured plates including structure for removably holding the pad in a predetermined position on one of the apertured plates with the rear end cover in open position and for holding the pad about its periphery in airtight sealing relation with the apertured plates along a line defining a zone which is transverse to the longitudinal axis of the cleaner and is completely enveloped by the casing and rear end cover with the latter in closed

position, the filter pad holding structure comprising means on one of the apertured plates for locating and positioning the four sides of the filter pad thereon, the opening in the filter pad receiving a pin projecting from the one apertured plate when the filter pad is placed on the latter to facilitate locating and positioning the filter pad, the other apertured plate having a flange of rectangular form at its periphery which extends longitudinally of the cleaner and engages the periphery of the filter pad when the latter is positioned and located on the one apertured plate and the rear end cover is in closed position, the other apertured plate also having a pressure ring which cooperates with the pin and is disposed about the latter and engages the filter pad to seal the latter about the opening when the rear end cover is in closed position, and a releasable fastening means for latching the pivoted rear end cover in closed position and releasing the latter for rocking movement from closed position for quick and easy access to the removable filter pad and reel.

5. In a horizontal tank-type suction cleaner, an elongated casing having at opposite ends thereof front and rear end covers provided with an air inlet and outlet, respectively, means in the casing for moving air therethrough from the inlet to the outlet, means comprising an end ring fitted on the casing at one end thereof, means including wheels for supporting the cleaner for movement on a surface, the supporting means including apertured lug means formed integrally with the end ring and depending downwardly from the casing and pin means held thereon upon which the wheels are mounted for movement about an axis normal to the longitudinal axis of the casing, at least a part of the rear end cover being of cup-like shape and having the outlet at its closed end and an apertured plate mounted at its opposite open end from which air flows to the outlet, means for pivotally mounting the rear end cover for rocking movement at the one end of the casing, an apertured plate fixed to the one end of the casing, the pivotal mounting means including apertured lug means formed integrally with the rear end cover and depending downwardly therefrom and mounted for movement on the pin means, the apertured plates forming a chamber therebetween with the rear end cover in closed position, an essentially flat filter pad of rectangular form having an opening therein, the apertured plates including structure for removably holding the pad in a predetermined position on one of the apertured plates with the rear end cover in open position and for holding the pad about its periphery in airtight sealing relation with the apertured plates along a line defining a zone which is transverse to the longitudinal axis of the cleaner and is completely enveloped by the casing and rear end cover with the latter in closed position, and a releasable fastening means for latching the pivoted rear end cover in closed position and releasing the latter for rocking movement from closed position for quick and easy access to the removable filter pad, the filter pad holding structure comprising means on one of the apertured plates for locating and positioning the four sides of the filter pad thereon, the opening in the filter pad receiving a pin projecting from the one apertured plate when the filter pad is placed on the latter to facilitate locating and positioning the filter pad, the other apertured plate having a flange of rectangular form at its periphery which extends longitudinally of the cleaner and engages the periphery of the filter pad when the latter is positioned and located on the one apertured plate and the rear end cover is in closed position, the other apertured plate also having a pressure ring which cooperates with the pin and is disposed about the latter and engages the filter pad to seal the latter about the opening when the rear end cover is in closed position.

(References on following page)

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References Cited in the file of this patent

UNITED STATES PATENTS

2,292,250	Tamarin	Aug. 4, 1942
2,311,369	Clements	Feb. 16, 1943
2,314,177	Tamarin	Mar. 16, 1943

2,323,275
2,719,600
2,814,358
2,825,924
2,848,731
2,888,093

12

Lofgren	June 29, 1943
Brace	Oct. 4, 1955
Beede et al.	Nov. 26, 1957
Humphrey	Mar. 11, 1958
Tamarin	Aug. 26, 1958
Wahlborg et al.	May 26, 1959