Feb. 5, 1946. C. H. TAYLOR 2,394,271

SUCTION CLEANING APPARATUS

Filed May 1, 1944 2 Sheets-Sheet 1

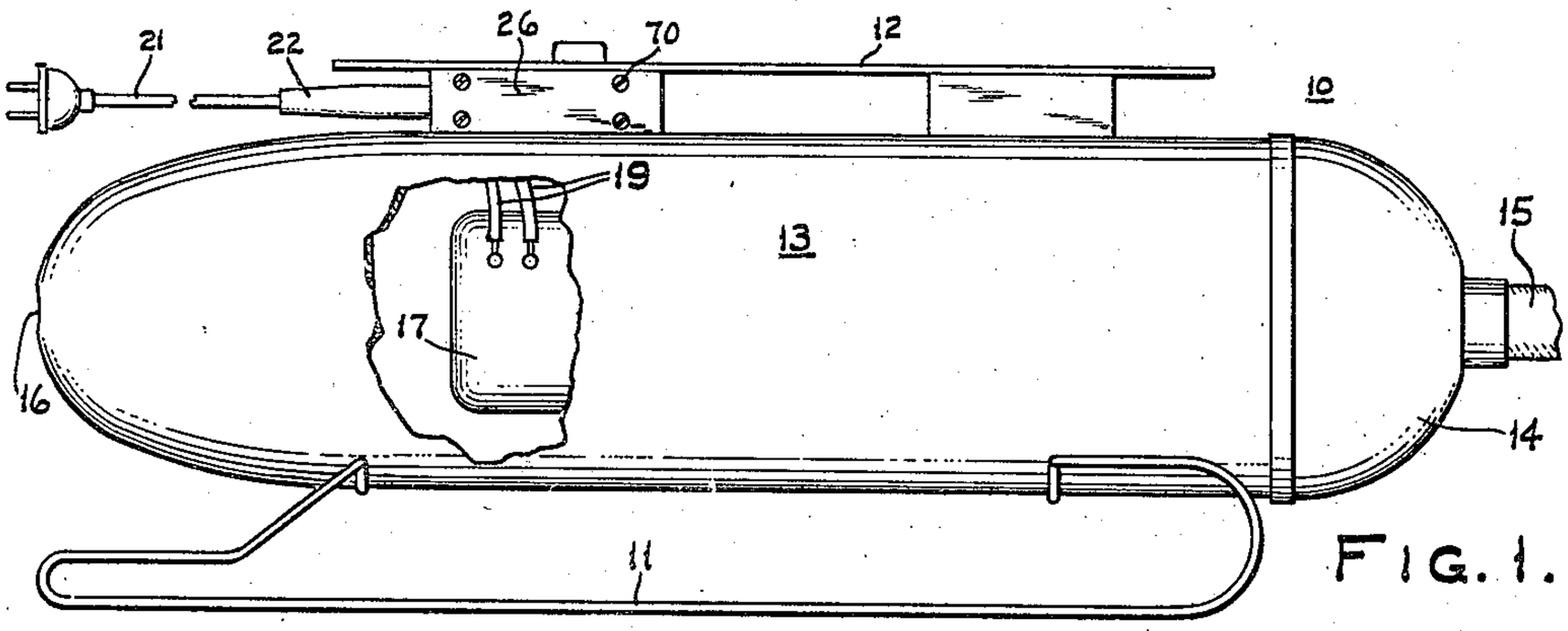


FIG. 1.

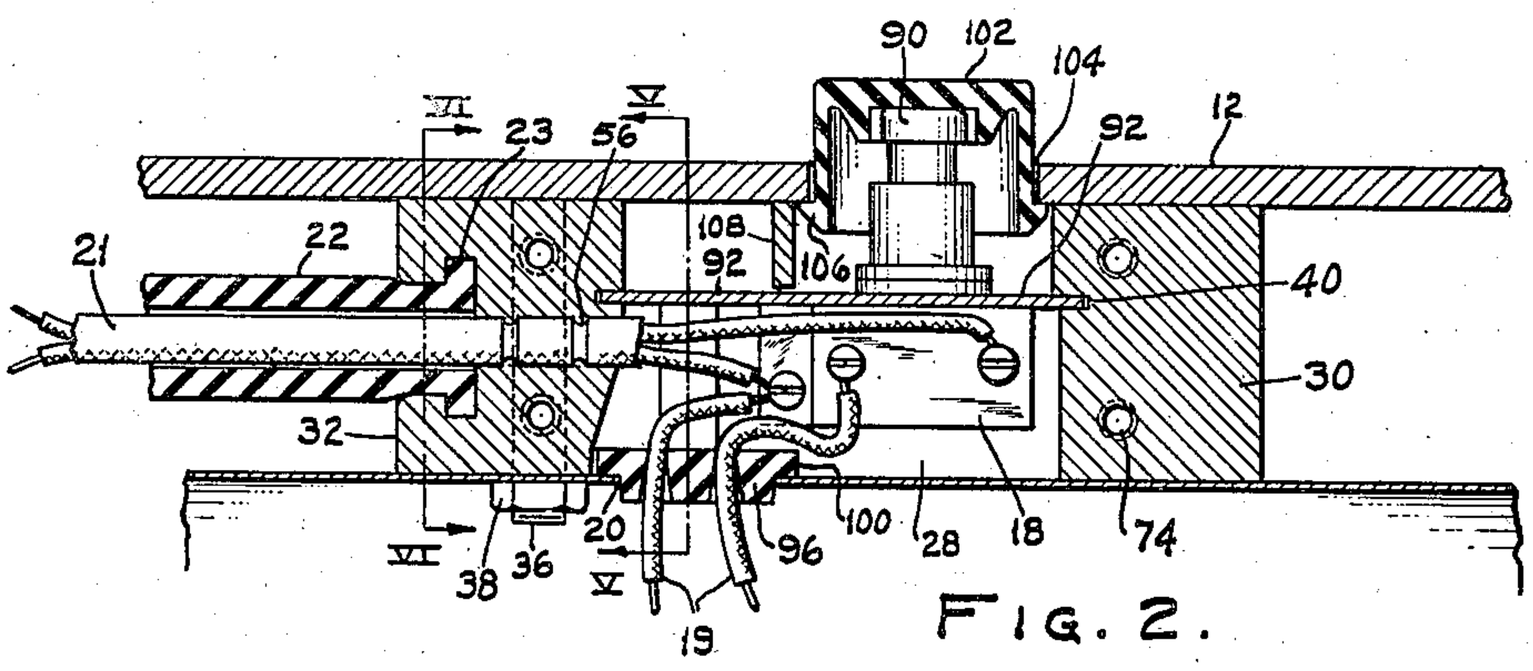
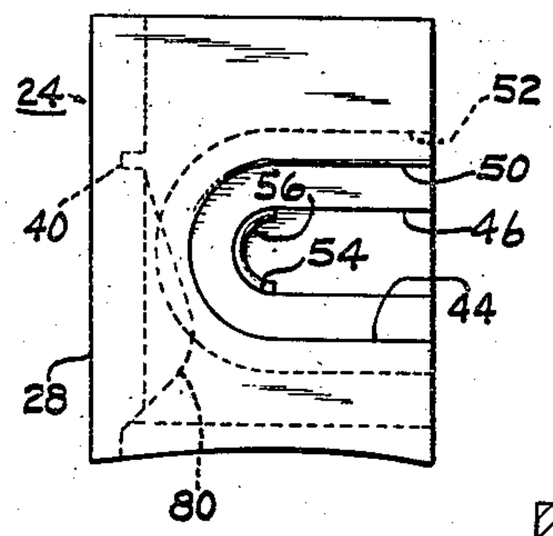
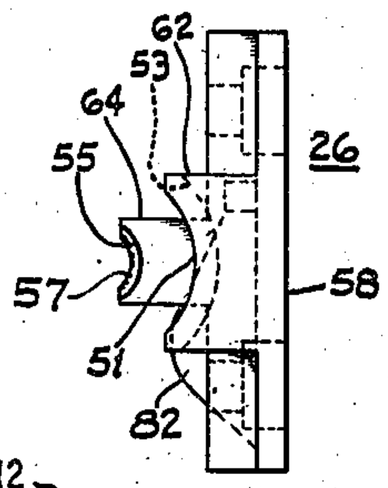


FIG. 2.

FIG. 4.





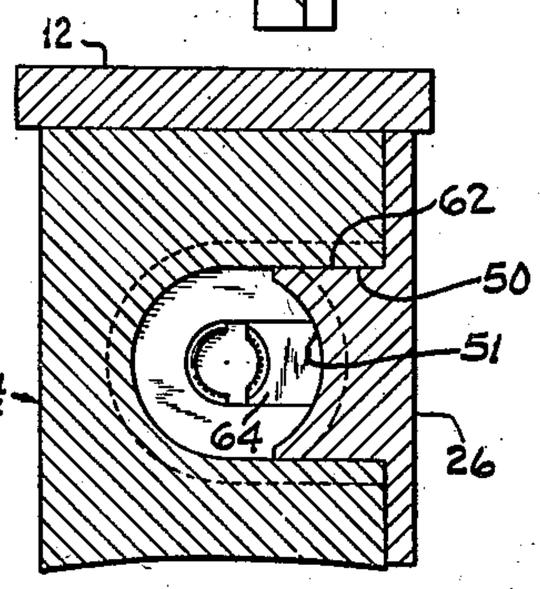


FIG. 3.

FIG. 6.

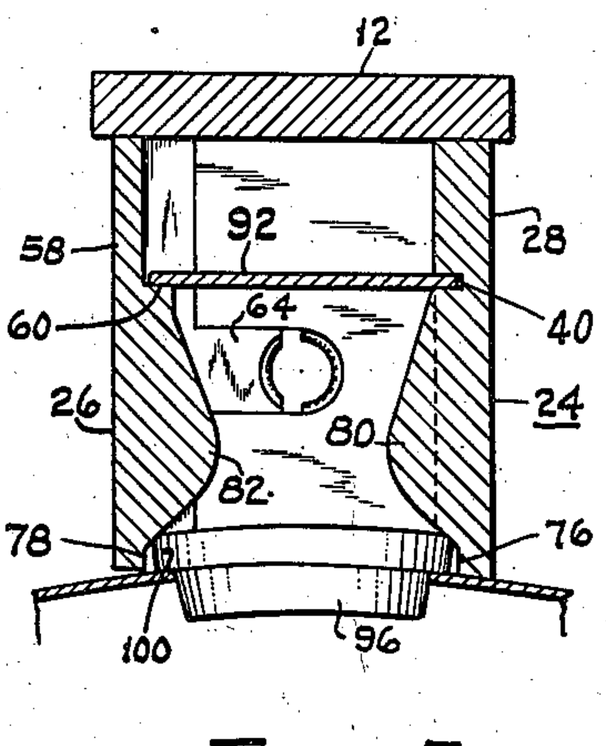


FIG. 5.

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SUCTION CLEANING APPARATUS

Filed May 1, 1944 2 Sheets-Sheet 2

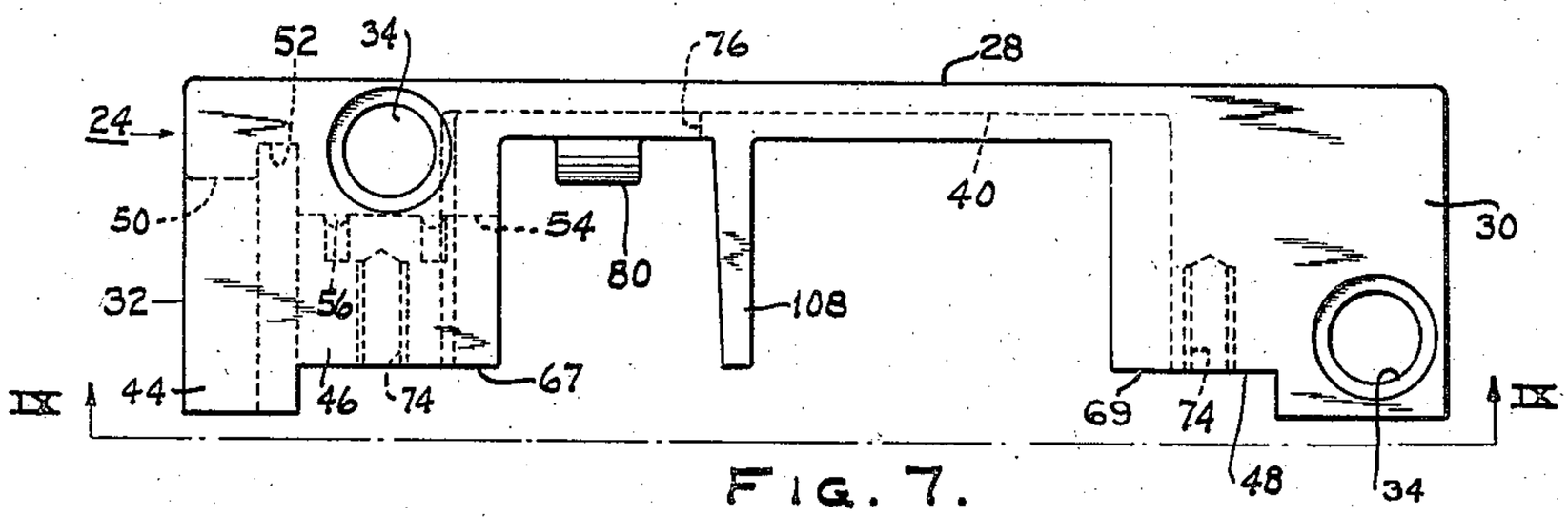


FIG. 7.

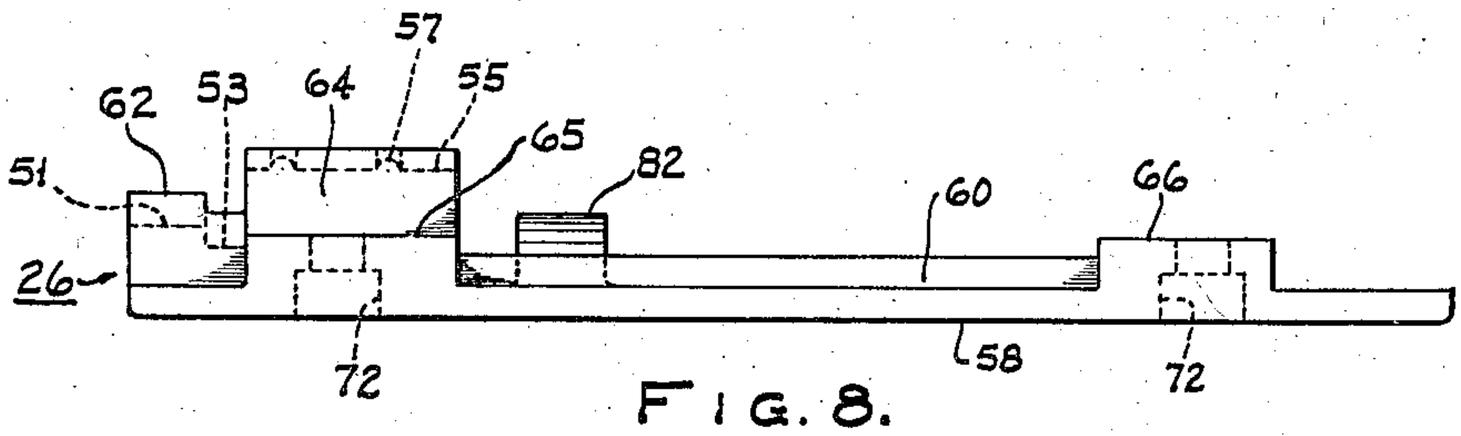


FIG. 8.

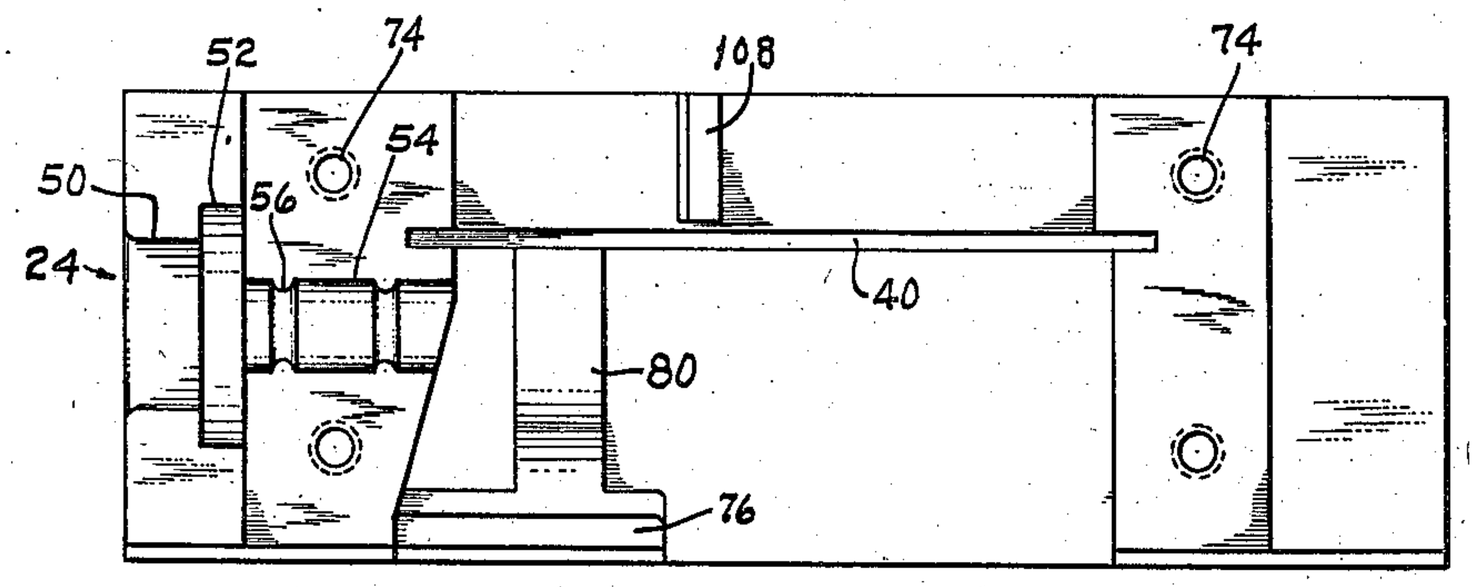


FIG. 9.

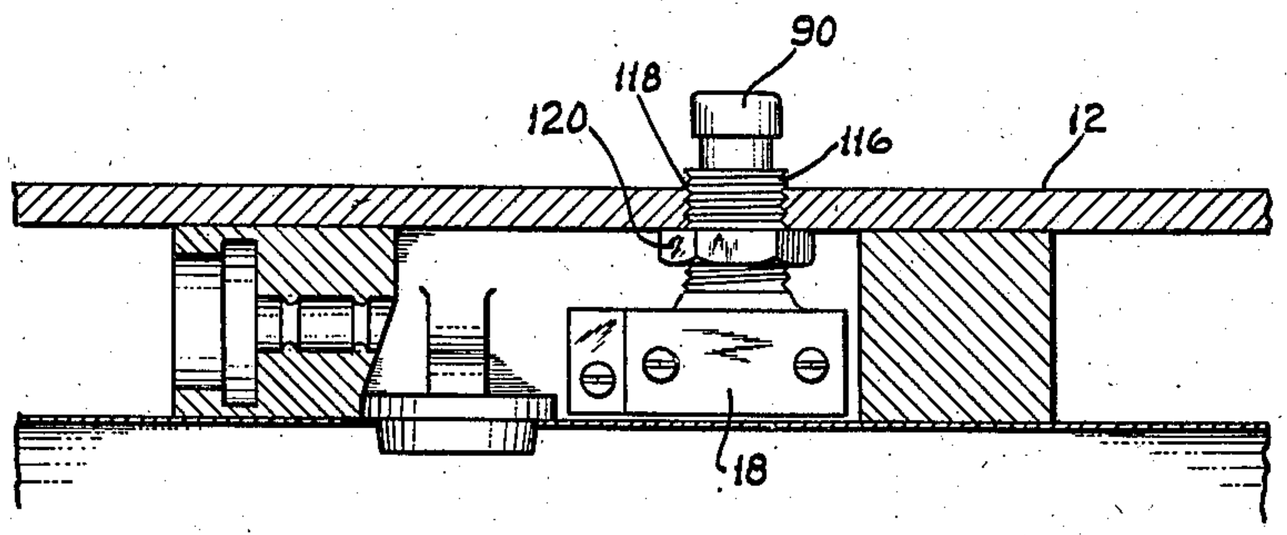


FIG. 10.

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UNITED STATES PATENT OFFICE

2,394,271

SUCTION CLEANING APPARATUS

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Application May 1, 1944, Serial No. 533,522

10 Claims. (Cl. 200—52)

My invention relates to a suction cleaner, more particularly to a suction cleaner of the tank type which includes an elongated casing for housing the usual fan-motor unit and filter, and a hose carrying any desired nozzle or dusting tool and connected to the fan-motor unit in said casing.

One object of my invention is to produce an improved suction cleaner of the type set forth.

In the tank type cleaner described, the casing is usually formed of a central, substantially cylindrical, open-ended body portion, and two end bells connected to and forming the opposite ends of the casing.

In some cleaners of this type, the switch controlling the motor and the wiring of the motor terminals to the switch are wholly enclosed within the casing, with the switch-actuating button and the electrical conductors leading to the switch extending through apertures in the wall of said casing. If such apertures are small so as to be easily sealed, access to the switch and wiring can be had only upon removing the adjacent end bell. If apertures big enough to afford access into the interior of the casing are provided, they cannot be properly sealed without elaborate and expensive structure.

In some other cleaners of the type referred to, the switch assembly projects through an aperture in the wall of the casing, thus making the sealing of such aperture difficult. In these constructions, the connection of the motor terminals to the switch terminals is enclosed within the casing so that making the connection between the motor and switch terminals in an original assembly, and the subsequent servicing of such connection during use, are rendered difficult and time consuming.

It is, therefore, a further object of my invention to devise an improved switch mounting for a suction cleaner of the type set forth.

A still further object is to devise an improved switch mounting means whereby the complete switch mechanism is located wholly without the casing of the cleaner, so as to be readily accessible, with only the electrical conductor leading from the switch to the motor passing through an opening in the wall of the cleaner casing.

A still further object of my invention is to produce an improved switch mounting structure in which the switch mounting means is disposed between the top of the casing and a handle extending longitudinally of and above the top of the casing, and in which said switch mounting means and said handle are assembled and secured to each other and to the casing by the same fastening means.

A still further object is to provide an improved switch mounting device which also includes strain relief for the electric cord of the cleaner.

A still further object of my invention is to provide an improved suction cleaner of the tank type having only one end bell which is removable for withdrawal and emptying of the filter bag, or for servicing or withdrawal of the motor and fan from the cleaner casing.

A still further object is to devise an improved switch mounting which will be compact, neat and inexpensive to produce and easy to assemble and service.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a view in side elevation of a suction cleaner embodying my invention;

Fig. 2 is an enlarged fragmentary view in vertical longitudinal section, showing the improved switch-mounting means embodying my invention;

Fig. 3 is a left-hand end elevation of one of the component parts of the switch-mounting means which is shown in top plan view in Fig. 6;

Fig. 4 is a left-hand end elevational view of the other component part which is shown in top plan view in Fig. 7;

Fig. 5 is an enlarged sectional view taken on line V—V of Fig. 2, certain parts being omitted for clarity of illustration;

Fig. 6 is a section taken on line VI—VI of Fig. 2;

Fig. 7 is a top plan view of the part shown in Fig. 3;

Fig. 8 is a top plan view of the part shown in Fig. 4;

Fig. 9 is an enlarged, front elevational view looking in the direction of the line IX—IX on Fig. 6; and

Fig. 10 is a view similar to Fig. 2, showing a modified form of construction.

Referring to Fig. 1, there is shown a tank type cleaner 10 supported on runners 11 and provided with a handle 12 extending longitudinally of, and in parallel spaced relation to, the top of the cleaner. The cleaner 10 includes a cylindrical, elongated body portion 13 and an end bell 14 detachably secured to the body portion 13 and forming one end of the cleaner casing. The end bell 14 is provided with a coupling member

to which a hose 15 may be connected in the usual way. The other end of the hose 15 is provided with a suitable nozzle or dusting tool (not shown). The other end of the body portion 13 is tapered and provided with an exhaust opening 16. Within the cleaner casing there is mounted the usual motor 17 which drives a fan (not shown) for drawing dirt-laden air through the hose 15 into and through a filter bag, which is also not shown. The filtered air is discharged through the exhaust opening 16.

The motor 17 is connected to a switch 18 by wires 19 passing through an opening 20 in the top of the casing. Electrical energy is supplied to the motor 17 by an electric cord 21, provided with a protective sleeve 22 having an enlarged head 23. The cord 21 is connected to the switch 18 in any approved manner. As shown in Fig. 2, the switch 18 is located wholly outside of the cleaner casing and is supported in position by the improved mounting means embodying my invention.

The improved switch-mounting means includes a mounting block 24 and a closure or cover member 26, which are shown in left-hand end elevation in Figs. 3 and 4 and in top plan view in Figs. 7 and 8.

The mounting block 24 is formed of a vertical side wall 28 and enlarged end bosses 30 and 32. The vertical wall 28 and the bosses 30 and 32 form a pocket or recess for accommodating the switch 18. The end bosses 30 and 32 are provided with vertical bores 34 for receiving bolts 36, carried by the handle 14, and adapted to pass through suitable openings in the top of the cleaner. The bolts 36 are adapted to be engaged by retaining nuts 38 disposed within the cleaner casing. The block 24 is also provided with a horizontal groove 40 formed in the wall 28 and in the juxtaposed faces of the end bosses 30 and 32. The groove 40 is formed at a point substantially halfway between the top and bottom of the mounting block 24, as shown in Figs. 2 and 5.

The end boss 32 of the mounting block 24 is further provided with a horizontal recess including a portion 44 and a portion 46 which are adapted to accommodate corresponding interfitting projections or bosses on the juxtaposed face of the closure member 26 when the switch-mounting means is assembled. The recesses 44 and 46 terminate in an inner arcuate wall which forms a seat for the electric cord and its protective sleeve. The seat referred to includes a portion 50 for accommodating the body of the sleeve 22, a portion 52 for accommodating the enlarged head 23 of the sleeve, and a portion 54 for accommodating the cord 21. The portion 54 of the recess is provided with spaced arcuate beads 56 which are adapted to coact with corresponding beads on the closure member 26 to compress the sheathing of the electric cord to provide strain relief. The end boss 30 of the mounting block 24 is provided with a recess 48, also adapted to receive a corresponding projection on the juxtaposed side of the closure member 26.

The closure member 26 includes a vertical side wall 58 which is recessed to form a horizontal shelf or shoulder 60, coextensive and in horizontal alignment with the groove 40 in the block 24. The closure member 26 includes bosses 62, 64 and 66, which when the mounting means is assembled, enter recesses 44, 46 and 48 with the shoulder 65 and the boss 66 abutting against the vertical surfaces 67 and 69 of the bosses 30 and 32. The bosses 62 and 64 are provided with a horizontal recess including portions 51, 53 and 55 which are complementary to the seat portions 50, 52 and 54, respectively, of the recess in the boss 32. See Figs. 7 and 8. The wall of the recess 55 is provided with beads 57 which are complementary to the beads 56 on the wall of the recess 54. The mounting block 24 and the closure 26 are clamped together by screws 70 passing through countersunk openings 72 in the wall 28 of the closure member 26, and engaging threaded holes 74 in the juxtaposed faces of the bosses 30 and 32 of the block 24.

The lower portions of the side walls 28 and 58 are recessed to form oppositely-disposed grooves 76 and 78, and are provided with humps or projections 80 and 82 which begin at a point below the groove 40 in the wall 28 and shelf 60 in the wall 58 and terminate just above the grooves 76 and 73, as clearly shown in Fig. 5.

The switch assembly 18 and the switch-operating button 90 are carried by a plate 92. The switch-operating button 90 is provided with an inverted cup-shaped cover 102 which extends upwardly through an opening 104, formed in the handle 12, and is provided with an enlarged lower rim 106. The enlarged lower rim 106 prevents the cover 102 from being withdrawn through the opening 104, and bears against the adjacent side of the boss 30 and the adjacent side of a guard 108 carried by the wall 28 of the block 24, to guide the button 90 in its vertical movement in turning the switch on or off.

In order to make a fluidtight connection between the wires 19 and the opening 20 in the top wall of the casing, the wires 19 are passed through relatively tight apertures formed in a grommet 96, which may be of rubber or the like and which has a flange 100 engaging the upper rim of the opening 20.

Assembly

In assembling a cleaner provided with a switch mounting embodying this invention, the switch plate 92, carrying the switch 18 and the switch-operating button 90, is inserted along three sides thereof into the groove 40 in the back wall 28 and in the juxtaposed sides of the bosses 30 and 32 of the mounting block 24. The cover 102 is then placed on the switch button 90 and the block 24, carrying the parts thus far described, is placed on top of the cleaner casing. The handle 12 is then placed on top of the block 24 with the bolts 36 thereof extending through the bores 34 and through the top wall of the casing. In this position, the switch button cover 102 extends through the opening 104 in the handle 12. The nuts 38 are then engaged with the bolts 36 and tightened to secure the handle 12 and the mounting block 24 to the cleaner casing. The motor 17, the fan driven thereby and the filter bag are next inserted and the end bell 14 is secured to the end of the cleaner casing. The wires 19 are withdrawn through the opening 20, threaded through the apertures in the grommet 96 for connection to the terminals of the switch 18. The grommet 96 is now inserted into the opening 20 and the portion of the flange 100 of the grommet adjacent the wall 28, is forced into the groove 76 and between the lower portion of the hump 80 and the top of the cleaner casing. This insures a tight joint between that portion of the flange of the grommet and the top of the casing. The electric cord 21 and its protecting sleeve 22 are positioned in the recesses 50 and 54, with the

enlarged head 23 of the protecting sleeve 22 seated in the recess 52 as clearly shown in Fig. 2. The wires 19 and the terminals of the cord 21 are connected to the terminals of the switch in the usual way. To complete the assembly, the closure member 26 is placed on top of the cleaner in contiguous juxtaposition to the mounting block 24 and is clamped thereto by the screws 70. With the closure member 26 clamped to the mounting block 24, the portion of the flange 100 adjacent the wall 58 of the closure member engages the recess 78 and is squeezed between the lower portion of the hump 82 and the top of the casing to insure a tight joint between that portion of the flange and the top of the casing.

Also, with the mounting block 24 and the closure 26 clamped tightly together, the beads 56 and 57 coact to pinch the sheathing of the electric cord 21, thus tightly clamping the same and providing strain relief for the terminal connections of the cord.

The fourth side of the switch plate 92 or the side thereof adjacent the closure member 24 is, as shown in Fig. 5, supported on the ledge or shelf 60 formed in the wall 58 of the closure member 26.

In Fig. 9, there is shown a modified form of construction which is identical with that shown in the preceding figures, except that the switch plate 92, the groove 40 and the shelf 60 are omitted. In this construction, the switch 18 is provided with a threaded portion 116 adapted to engage a threaded opening 118 in the handle 12 and is retained in position by a nut 120. Except for this difference, the structure is exactly as that shown in Figs. 1 to 8 and is, therefore, not shown or described in detail.

It will thus be seen that by my construction, the switch and all of its connections are mounted exteriorly of the cleaner casing and that the same are accessible for inspection and servicing upon disengagement of the closure member 26 from the mounting block 24. It will also be seen that the opening 20 is adequately and easily sealed by the grommet 96, the body portion of which fits tightly in the opening 20 and the flange of which is tightly clamped between the hump portions 80 and 82 and the top of the casing.

While I have shown my invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a suction cleaner, a casing, a handle for said cleaner, a mounting block disposed between said casing and said handle and having a recess therein, means for securing said handle and said block to said casing, a switch for controlling the supply of electrical energy to said cleaner, said switch being mounted in said recess, there being an opening in the wall of said casing communicating with said recess and through which wires leading from the terminals of said switch are adapted to pass, an electric cord for supplying electrical energy to said switch, a closure member for closing said recess, and means for securing said closure member to said block, there being complementary recesses in the juxtaposed, contiguous walls of said mounting block and said closure member forming a bore through which said cord extends for connection to the terminals of said switch.

2. The structure recited in claim 1 together with a protecting sleeve encasing a portion of the cord, there being complementary recesses in the juxtaposed portions of said block and said closure member forming a seat engaging said sleeve.

3. The structure recited in claim 1 together with a supporting plate carrying the switch, there being horizontal shelves formed in juxtaposed portions of said block and said closure member for engaging marginal portions of said plate.

4. The structure recited in claim 1 together with means for effecting a fluid-tight seal between the opening in the wall of the casing and said wires comprising a grommet including a body portion adapted to be inserted into said opening and having apertures therein through which said wires pass, and a flange engaging the upper rim of said opening, and means carried by juxtaposed portions of said block and said closure member which, when said block and said closure member are assembled, clamp portions of said flange against said wall of said casing.

5. In a suction cleaner, a casing, a handle extending above said casing, there being an opening in said handle, a switch for controlling the supply of electrical energy to said cleaner, an operating button for said switch movable through said opening, means for guiding and limiting movement of said operating button, and an electric cord for supplying electric energy through said motor to said switch, means for mounting said switch between said handle and the top of said casing whereby said switch and the connections of the terminals of said switch to the terminals of said cord are wholly disposed outside said casing, said means including interfitting complementary members, means carried by said handle and extending through one of said members and the wall of said casing for securing said handle and said member to the top of said casing, means for supporting said switch between said members, there being an opening in the top of said casing through which wires leading from the terminals of said switch are adapted to pass, means for closing said opening, and means for clamping said members together in assembled relation, there being complementary recesses formed in juxtaposed portions of said members which, when said members are assembled, provide a seat engaging a portion of said cord.

6. The combination with a suction cleaner including a casing, a handle, and a switch for controlling the supply of electrical energy to said cleaner, of means for mounting said switch between the handle and the casing with the switch and all of its terminals disposed wholly outside of said casing and with said means supporting at least a portion of said handle.

7. In a suction cleaner, a casing, a handle extending above said casing, mounting means for mounting a switch controlling the supply of electrical energy to said cleaner, said means including a block disposed between said casing and said handle and having a recess therein adapted to receive a switch, and a closure member for closing said recess, means for securing said handle and said block to said casing, means for mounting said switch in said recess, there being an opening in the wall of said casing communicating with said recess and through which wires leading from the terminals of said switch are adapted to pass, and means for securing said closure member to

said block, said mounting means having an opening therethrough for receiving an electric cord for connection to the terminals of said switch.

8. The combination with a suction cleaner including a casing, and a handle, of means for mounting a switch between said casing and said handle, with the switch and all of its terminals disposed wholly outside of said casing and with said mounting means supporting at least a portion of said handle, said mounting means including a block disposed between said handle and said casing and having a recess therein adapted to receive a switch, there being an opening in said casing through which wires leading from the terminals of said switch are adapted to pass, means for securing said handle and said block to said casing, a closure member for said block, and means for securing said closure member to said block, there being complementary recesses in juxtaposed walls of said block and said closure member for engaging a portion of an electric cord leading from a source of electrical energy to the terminals of said switch.

9. Means for mounting a switch on a support, said means including a block having end walls and an intermediate side wall, there being a recess intermediate said end walls for receiving a switch, said recess having top and bottom openings for passage of the switch pushbutton and the wires leading from the terminals of said switch, respectively, a closure for said recess, and means for securing said closure to said block, there being complementary recesses in said block and said closure member for passage of an electric cord leading to the terminals of said switch.

10. The structure recited in claim 9 in which said block and said closure member are provided with shelves in juxtaposed walls thereof for supporting a plate carrying said switch.

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