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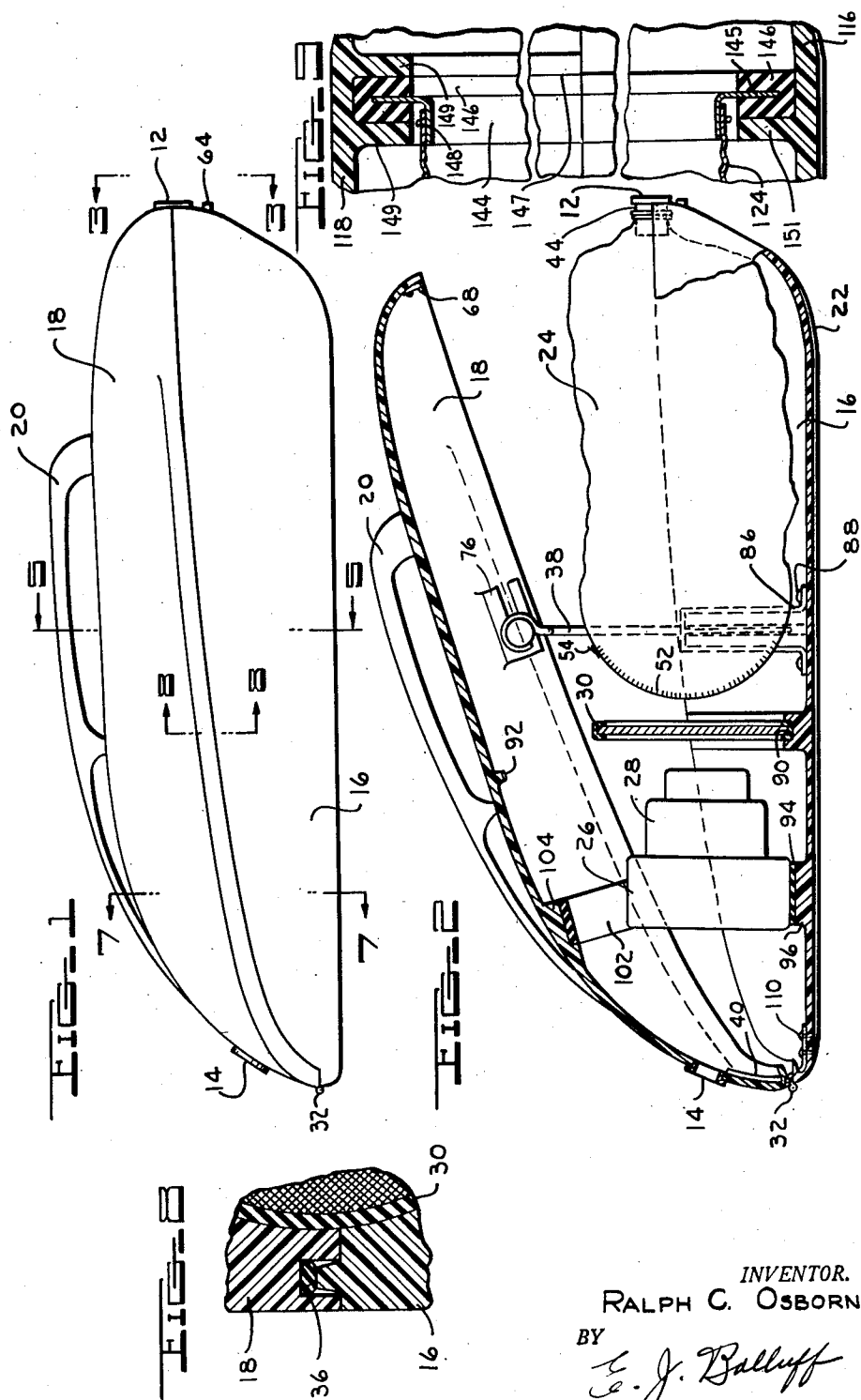
R. C. OSBORN

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TANK TYPE SUCTION CLEANER

Filed Oct. 30, 1946

2 Sheets-Sheet 1



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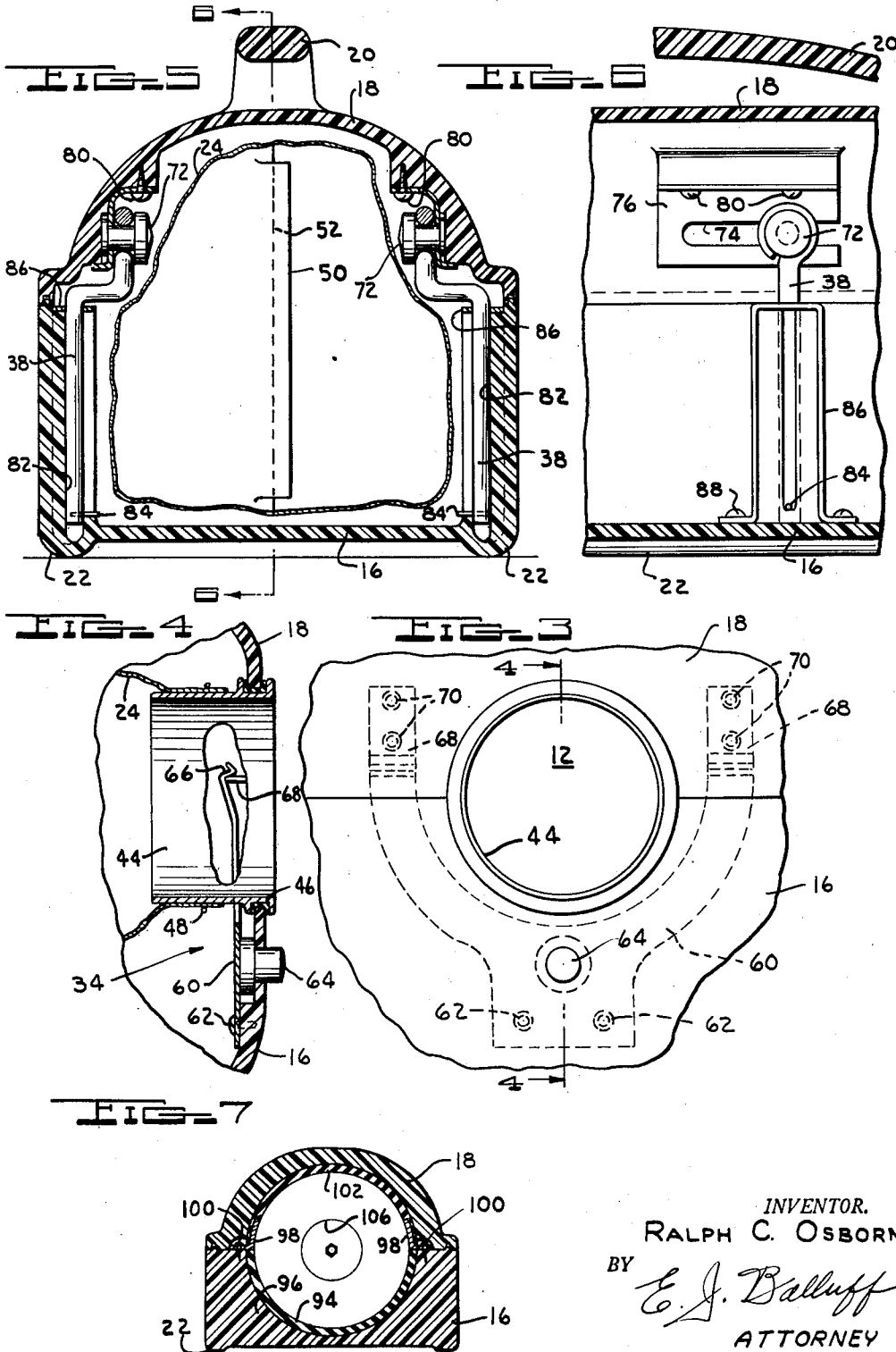
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TANK TYPE SUCTION CLEANER

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1 Claim. (Cl. 183—37)

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This invention relates to tank type suction cleaners and has particular reference to a new and improved construction for the casing of the cleaner which expedites the manufacturing thereof and which facilitates the removal and replacement of the dirt collecting bag by the user of the machine.

In tank type cleaners as heretofore commonly constructed, an end bell is employed to form a closure at the front end of the cleaner and to secure the dirt collecting bag in place. This type of construction presents many objections both from the standpoint of manufacturing and of use of the cleaner. According to the present invention, I have devised a tank type cleaner construction in which the end bell has been eliminated and the casing is split longitudinally and made in two parts.

A principal object of the invention, therefore, is to provide a new and improved construction for tank type suction cleaners.

Other and further objects of the invention will be apparent from the following description and claims and will be understood by reference to the accompanying drawings, of which there are two sheets, which, by way of illustration, show preferred embodiments and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claim. I also contemplate that of the several different features of my invention, certain ones thereof may be advantageously employed in some applications separate and apart from the remainder of the features.

In the drawings

Fig. 1 is a side elevational view of a tank type cleaner embodying the invention;

Fig. 2 is a longitudinal vertical sectional view of the cleaner with the casing members in their open position;

Fig. 3 is an enlarged fragmentary elevational view of the front end of the cleaner taken along the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3;

Fig. 5 is an enlarged sectional view taken along the line 5—5 of Fig. 1, looking in the direction of the arrows;

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Fig. 6 is a fragmentary sectional view taken along the line 6—6 of Fig. 5;

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 1, looking in the direction of the arrows;

Fig. 8 is an enlarged fragmentary sectional view taken along the line 8—8 of Fig. 1; and

Fig. 9 is an enlarged fragmentary vertical sectional view illustrating a modified form of the invention and showing particularly a different arrangement for securing the dirt collecting bag within the casing of the cleaner.

Referring now to Figs. 1, 2 and 8, a suction cleaner embodying the invention comprises a casing having air inlet and outlet openings 12 and 14, said casing being horizontally split into lower and upper casing members 16 and 18. A handle 20 is secured to the upper casing member 18. The cleaner is adapted to be supported on the floor in the position shown in Fig. 1 and is provided with sleds or runners 22 for supporting the cleaner for movement on the floor. One end of a flexible hose (not shown) is adapted to be coupled with either the air inlet opening 12 or the air outlet opening 14 and as is common in the art, a cleaning tool is connected to the other end of the flexible hose.

A dirt collecting and filtering element in the form of a bag 24 is arranged inside of the casing. A unit comprising a fan 26 and an electric motor 28 is also arranged within the casing and supported on and by the lower casing member. The fan and motor unit is operative for circulating air through the casing and the inlet and outlet openings thereof. The bag 24 is arranged to separate dirt from the air circulated through the casing and to collect such dirt.

A second filtering element 30 may be arranged between the bag 24 and the motor and fan unit 26, 28. The space in the casing upstream of the filtering element 30 may for convenience be designated as the bag space, while that downstream thereof may be referred to as the motor and fan compartment.

A hinge 32 connects the casing members 16 and 18 at one end thereof so as to permit the casing members to pivot relative to each other between the closed position shown in Fig. 1 and the open position thereof shown in Fig. 2. A latch mechanism indicated generally at 34 (Fig. 4) is associated with the front end of the casing members for locking the same in closed position. The meeting edges of the casing members 16 and 18 are constructed so as to have an interfitting relationship as shown in Fig. 8 when such casing

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members are in their closed position and a sealing means 36 is associated with such meeting edges so as to seal the joint between the upper and lower casing members.

A pair of guide rods 38 are pivoted to the upper casing member 18 and have a sliding connection with the lower casing member 16 for guiding the casing members relative to each other during movement thereof and for determining the open position of the casing members. Spring means in the form of a leaf spring 40 may be arranged for biasing the casing members to their open position.

The upper and lower casing members 18 and 16 may comprise two hollow moulded plastic pieces or members which are adapted to be assembled together as illustrated in Fig. 1 so as to form a casing for housing the operating parts of the cleaner. At the front, the casing members 16 and 18 are formed as shown in Figs. 3 and 4 to provide a seat for the bag ring or sleeve 44. This ring may be formed with an outside channel in which a U-shaped gasket 46 is arranged and which is adapted to receive the edges of the casing members 16 and 18 so as to secure the ring 44 in the position as illustrated.

The ring 44 forms the air inlet to the bag 24 and may in addition form a part of a coupling by means of which the flexible hose previously referred to may be operatively secured to the cleaner with the interior of the hose in communication with the interior of the bag 24. The bag 24 which is formed of a suitable air pervious filtering material has its neck receiving the sleeve 44 and is securely clamped thereto by means of a band 48.

When the casing member 18 moves to its open position as shown in Fig. 2, the bag and the ring 44 will remain assembled with the lower casing member 16. However, the ring 44 may be lifted out of its seat whereby the bag 24 may then be removed from the cleaner. The other end of the bag is provided with an opening in the form of a slit 50 and with cooperating interlocking fastener elements 52 along the edges of the slit and a slider 54 for interlocking and for releasing the fastening elements 52. The slit 50 is closed by the fastener elements 52 with the slider 54 in the position shown in Fig. 2. After removal of the bag 24 from the cleaner, the discharge slit 50 may be opened by moving the slider 54 to the other end of the slit so as to release the fastener elements whereby the dirt accumulated in the bag 24 may readily be emptied therefrom through the slit 50.

The latching mechanism 34 comprises a yoke-shaped member 60 secured to the casing member 16 at 62, a releasing button 64, a pair of latches 66 and a pair of hooks or keepers 68, the hooks or keepers 68 being fastened to the upper casing member 18 by means of pins 70. The yoke-shaped member 60 is formed of resilient material, such as spring steel, and the arms of the members straddle the sleeve 44. The latches 66 are formed on the upper ends of the arms of the member 60 and when the casing members are in their closed position, as shown in Figs. 1, 3 and 4, the latches 66 will engage the keeper 68 and clamp the casing members 16 and 18 together. Deflecting the member 60 by means of the release pin 64 will disengage the latches 66 from the keeper 68 and permit the casing member 18 to move to its open position as shown in Fig. 2 under the influence of the spring 40. The spring 40 may be omitted if the automatic

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opening action of the casing members is not desired. The keeper 68 and latches 60 are arranged so as to automatically engage upon closing movement of the casing members 16 and 18.

Each guide rod 38 is pivoted on a pin 72 which is slidably arranged in a guide 74 provided by a slotted member 76. The slotted member 76 is secured to the upper casing member 18 by means of one or more screws 80. The other end of the guide rod works in a guide 82 formed in the lower casing member 16. A pin 84 carried by the rod 38 engages a strap 86 to limit the opening movement of the casing member 18 relative to the casing member 16. The strap 86 comprises a U-shaped metal piece which fits over the part of the casing member 16 forming the guide 82 and is secured by means of rivets 88 to the bottom wall of the casing member.

The lower casing member 16 is provided with an upwardly opening channel 90 which forms a seat for the filtering element 30. The element 30 may consist of an annular U-shaped rubber ring which encloses a sandwich of suitable filtering material. The upper casing member is provided with a transverse rib 92 which when the casing members are in their closed position seats on the downstream side of the filtering element 30 so as to help maintain it in its proper position. The filtering element 30 spans the interior of the casing and has a sealing fit with the inside walls thereof so that the air flowing through the casing must flow through the filtering material of the element 30.

The fan and motor unit 26, 28 may comprise a high speed centrifugal fan and an electric motor. The outer periphery of the casing of the fan 26 is seated in a seat formed by a strip of resilient material 94 supported on a transverse rib 96 formed integrally with the lower casing member 16. The casing of the fan may be provided with brackets 98 by means of which the fan and motor unit may be secured to the rib 96 by means of removable fastening elements 100.

A strip 102 of resilient material, such as rubber, is secured to the inside of a rib 104 formed integrally with the upper casing member 18 and when the casing members are in their closed position, forms a seal between the fan 26 and the upper casing member 18. The motor 28 is provided with suitable openings through which air may enter the fan 26 and the fan is provided with a discharge opening 106 from which air escapes from the fan into the interior of the casing on the downstream side of the fan and thence through the outlet port 14.

The spring 40 may comprise one or more leaf springs riveted or otherwise suitably secured to the lower casing member at 110. The interfitting relationship between the meeting edges of the upper and lower casing members may be provided by the tongue and groove construction shown in Fig. 8.

In the modification shown in Fig. 9, the bag 124 is not provided with a reduced inlet neck, nor need it be provided with the slit 50 and the zipper fastener closure therefor as shown in Fig. 2. Instead of this, the mouth of the bag is secured to a ring 144 by means of a band 143, the ring 144 being of substantially the same area as the cross-sectional area of the bag and having an outwardly turned flange 145 which is secured in a U-shaped annular rubber ring 146.

The upper casing member 118 which is otherwise the same as the casing member 18 is pro-

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vided with a slot or socket 147 formed by ribs 149 in which the ring 146 is frictionally secured. By reason of this, the bag ring 144 and the bag will move with the upper casing member when the same moves to its open position. Thereafter, by pulling the ring 146 out of the slot 147, the bag may be separated from the casing member 118 in order that the dirt accumulated in the bag may be emptied.

The lower casing member 116 is provided with a rib 151 which forms a seat or shoulder against which the ring 146 seats when the casing members are in their closed position. In this way, the dirt-laden air which flows into the casing must flow through the ring 144 into the bag 124. If desired, the ribs 149 may be arranged in the lower casing member 116 and the rib 151 may be arranged on the upper casing member 118 so that the bag will remain with the lower casing member when the upper casing member moves to its open position. In this case, the sleeve 44 would then function only as the coupling member and the air inlet 12 to the casing. The ribs 149 and 151 preferably would be positioned as close to the front end of the casing members as possible.

While I have illustrated and described preferred embodiments of my invention, it is understood that these are capable of modification and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claim.

I claim:

A suction cleaner comprising a casing having air inlet and outlet openings, said casing being horizontally split into lower and upper casing members, a dirt collecting and filtering element in said casing, a fan and a motor arranged within said casing and supported on and by said lower casing member and operative for circulating air

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through said casing and said inlet and outlet openings, said collecting and filtering element being arranged to separate dirt from the air circulated through said casing and to collect such dirt, a hinge means connected to said casing members at one end of said casing so as to permit said casing members to pivot relative to each other between closed and open positions, latch mechanism associated with the other end of said casing members for locking the same in closed position, the meeting edges of said casing members being constructed so as to have an interfitting relationship when such casing members are closed, sealing means associated with such meeting edges, said dirt collecting and filtering element comprising a bag having an opening therein and including a sleeve in said opening, said sleeve having a circumferential groove therein, the meeting edges of said casing members cooperating with said groove in said sleeve so as to clamp said sleeve therebetween when said casing members are in their closed position, said sleeve defining said air inlet to said casing.

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