

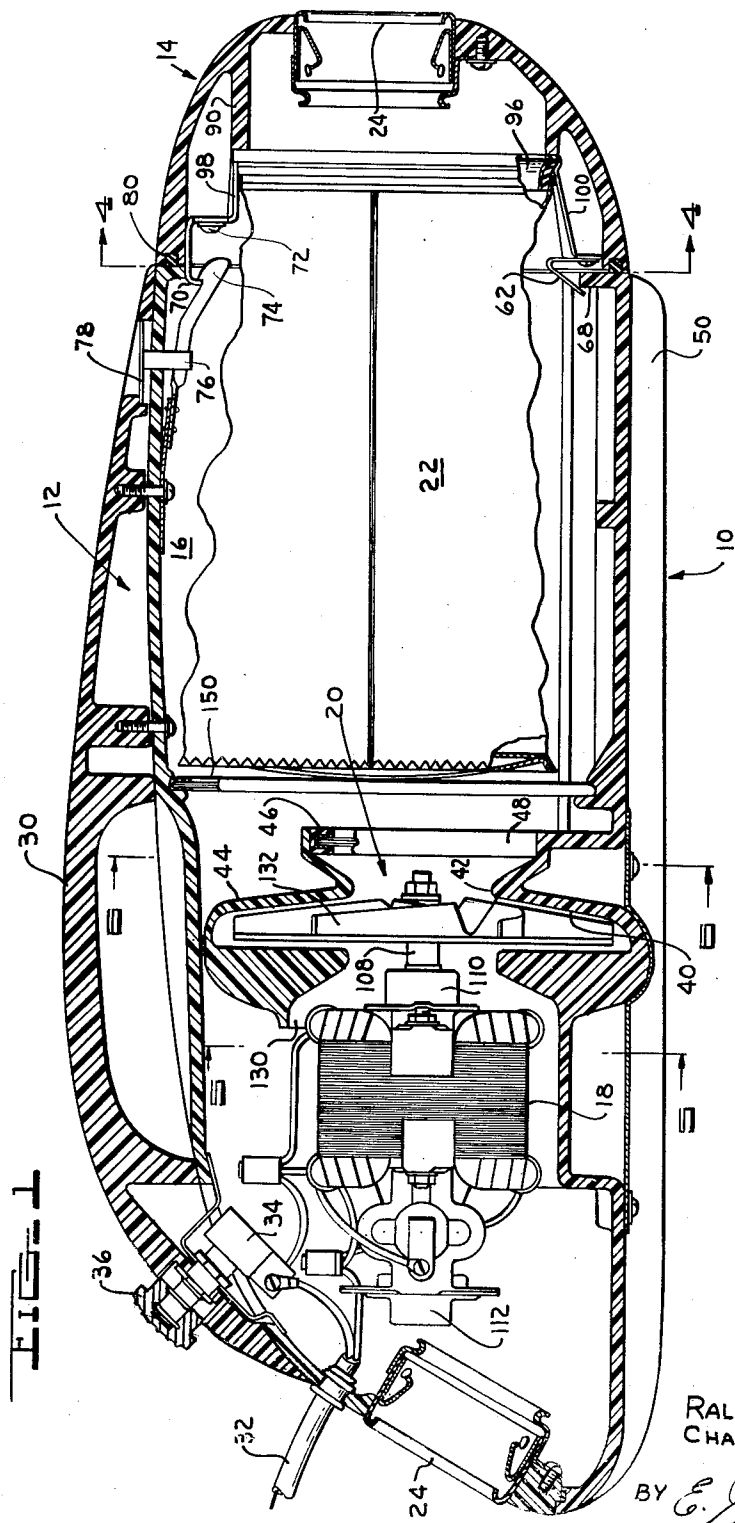
April 11, 1950

R. C. OSBORN ET AL  
TANK TYPE SUCTION CLEANER

2,503,918

Filed Dec. 23, 1946

3 Sheets-Sheet 1



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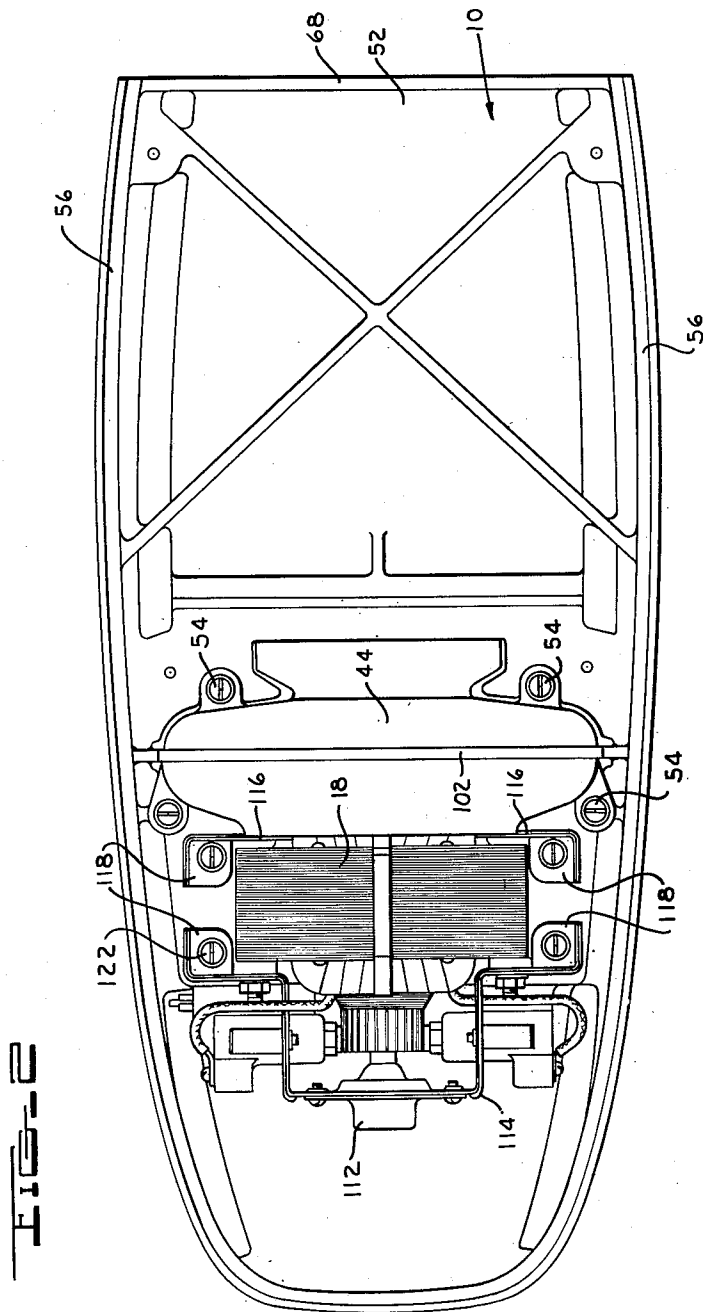
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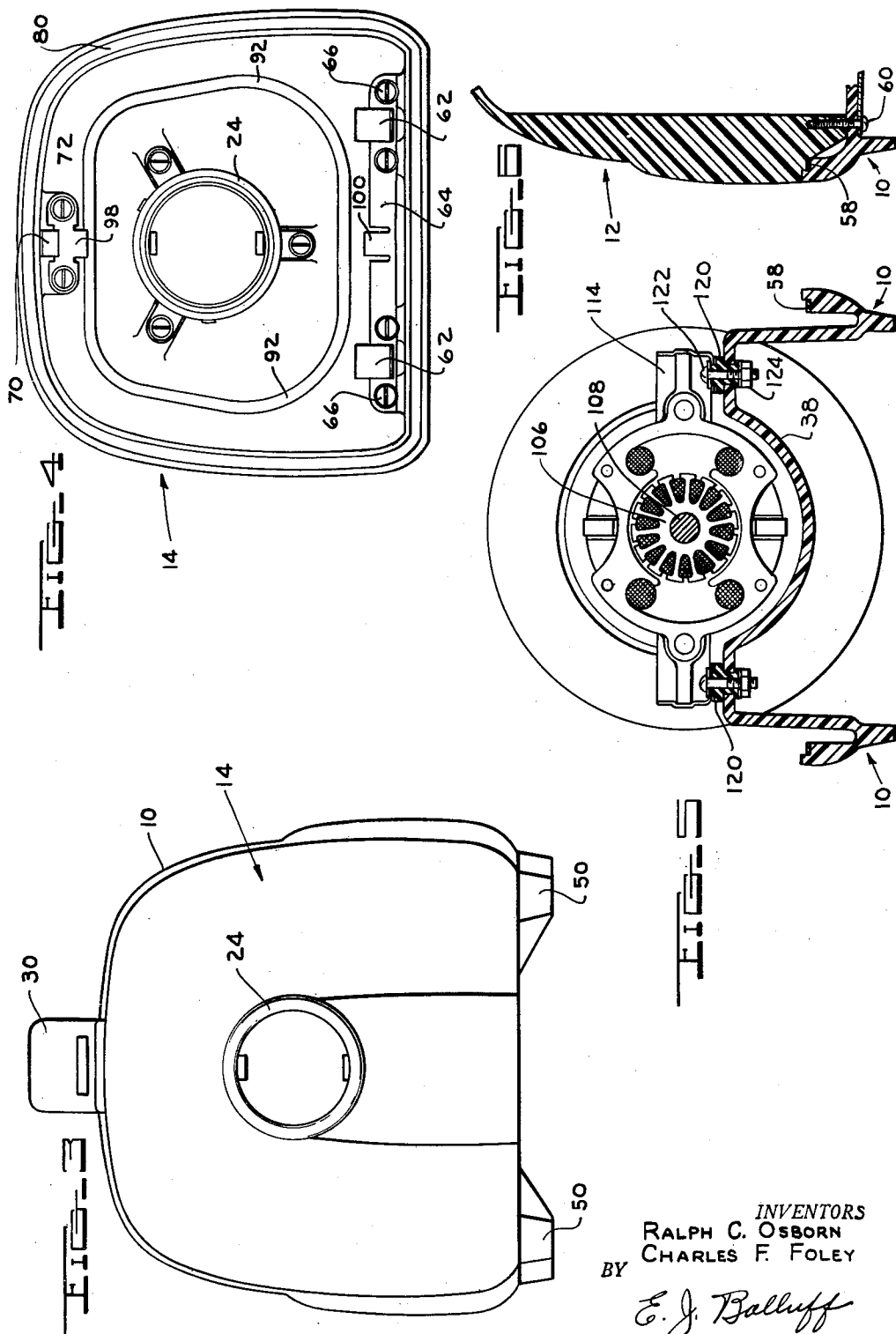
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## UNITED STATES PATENT OFFICE

2,503,918

## TANK TYPE SUCTION CLEANER

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12 Claims. (Cl. 183—37)

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This invention relates to tank type suction cleaners and has particular reference to a novel and improved construction for horizontal cleaners of this type whereby the parts thereof may more readily be manufactured and assembled.

Cleaners of this type are in common use today but the construction of such cleaners is such that the expense of manufacturing the same is relatively high due to the shape and relative arrangement of the parts thereof. According to this invention, parts of the cleaner are constructed and arranged in such a manner so as to make it possible economically to build cleaners of this type without sacrificing the performance or appearance thereof and at a lower cost than heretofore possible.

This invention contemplates a casing made of several moulded plastic pieces, one of which comprises a base member which forms a support for the motor, a part of a fan chamber cavity and the bottom wall of the bag space, and to which base member a motor and fan unit, a hood, a dirt collecting bag and an end cap may readily be assembled so as to complete the cleaner. The base also is formed to provide runners for supporting the cleaner for movement on the floor.

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

Another object of the invention is to provide a new and improved arrangement for removably securing the dirt collecting bag in the cleaner so as to expedite the removal and replacement thereof.

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 three sheets, which by way of illustration show preferred embodiments and the principles thereof and what we now consider to be the best mode of 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 claims.

We also contemplate that of the several different features of our invention certain ones thereof may be employed in applications separate and apart from the remainder thereof.

In the drawings:

Fig. 1 is a longitudinal sectional view of a cleaner embodying the invention;

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Fig. 2 is a plan view of the base with the motor and fan assembled thereto;

Fig. 3 is a front elevational view of the cleaner;

Fig. 4 is an elevational view of the end cap taken along the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary sectional view taken along the line 5—5 of Fig. 1, looking in the direction of the arrows; and

Fig. 6 is a fragmentary sectional view taken along the line 6—6 of Fig. 1, looking in the direction of the arrows.

Referring now particularly to Fig. 1, a tank type suction cleaner embodying the invention comprises, in general, a base 10, a hood 12, and an end cap 14, forming a casing which defines a bag space 16, and houses a motor 18, a fan 20, and a dirt collecting and filtering bag 22. The end cap 14 is provided with a coupling member 24 defining an air inlet to the cleaner which communicates with the interior of the bag 22. The other end of the casing is also provided with a coupling member 24, which forms an air outlet from the cleaner.

As is well known in the art, a suction cleaning tool or other device may be connected to the cleaner by means of a flexible hose having a coupling which may be detachably connected with either of the couplings 24.

The fan 20 is driven by the electric motor 18 and operative for effecting a circulation of air into the cleaner through the air inlet thereof, through the bag 22, through and over the motor 18, and out of the casing through the outlet thereof where the bag 22 is arranged to collect the dirt entrained in such air and to effect the separation of such dirt from the air. A handle 30 is secured to the casing and electric current is supplied to the motor 18, through the cord 32, and under the control of a switch 34 arranged to be opened and closed by manipulation of the button 36.

The base member 10 comprises a moulded generally flat, horizontally disposed plastic piece which is formed (Figs. 1 and 5) to provide a support 38 for the motor 18 and a cavity 40 open at its upper end. The cavity 40 forms the lower half of a horizontal axis fan chamber.

Integral portions of the base also define part of an inlet 42 to the fan chamber. A cover 44 secured to the base member cooperates with the cavity 40 to complete the fan chamber and to complete the inlet 42 thereto. The cover 44 and a portion of the base member ahead of the fan chamber cavity 40 also define an annular seat 46 for an air filter 48.

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The base member 10 is formed to provide runners 50 on which the cleaner is supported and the bottom wall 52 of the bag space 16. The cover 44 may be secured to the base by means of screws 54. The base 10 is also formed to provide a seat 56 which extends along the sides of the base and across the back thereof, which is shaped to receive and seat the complementary shaped lower edge of the hood 12 in the manner shown in Figs. 1 and 6. A gasket 58 may be arranged on the seat 56. A series of bolts 60 arranged in the manner illustrated in Fig. 6 may be employed for detachably securing the hood 12 to the base 10, the bolts extending upwardly through holes in the base and being threaded into threaded holes in the hood 12. The base 10 and hood 12 are formed at one end of the casing to define an access opening to the bag space 16, and this opening is closed by the end cap 14.

A pair of hooks 62 formed integrally with a piece 64 secured to the inside of the cap 14 by screws 66 engages the upstanding edge 68 of the base member so as to locate and secure the lower end of the cap 14 relative to the casing. A finger or keeper 70 secured to the cap 14 by means of screws 72 projects through the access opening to the bag space 16 and is arranged to be engaged by a spring biased latch 74 mounted in the upper part of the bag space 16. The latch 74 is biased to the position illustrated in Fig. 1 and may be released from keeper 70 by means of a plunger 76 having a button 78 exposed to the exterior of the casing, the button 78 being carried by the plunger 76 and the plunger being reciprocally mounted in the wall of the case and having a connection with the latch 74, so that upon depression of the button 78, the latch 74 will separate from the keeper 70 and permit the upper end of the cap 14 to be swung away from the casing after which the hooks 62 may be disengaged from the edge 68 by the upward movement of the cap 14 relative to the casing, thereby effecting the separation of the cap 14 from the casing.

To reassemble the cap 14 to the casing, hooks 62 are engaged with the edge 68 and the cap pivoted counterclockwise until the keeper 70 engages the latch. A gasket 80 may be arranged in a groove in the rim of the cap 14 and arranged to engage the end face around the bag space access opening so as to provide a seal between the end cap and the remainder of the casing. The end cap 14 may be formed of a moulded plastic piece and includes a continuous wall or partition 90 which forms a seat 92 for the bag ring 96. The bag ring 96 may comprise a rubber covered metal ring to which the bag 22 is secured and which forms the mouth or inlet opening to such bag. Ring 96 is adapted to seat on the seat 92. A latch 98, which may be formed integrally with the piece on which the keeper 70 is formed, is arranged to engage one side of the ring 96 and hold the same on the seat 92. Spring clip 100, formed integrally with the piece 64, is arranged to engage the opposite side of the ring 96 and secure the same against the seat 92.

By deflecting the clip 100, the lower end of the ring 96 may be separated from its seat and thereafter the upper end of the ring 96 may be disengaged from the latch 98 and the adjacent portion of the seat 92. The bag is thus secured to the end cap 14 and removed from the bag space when the end cap 14 is separated from the casing. The bag may be readily separated

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from the end cap and reassembled thereto as the clip 100 is a spring clip which may be readily manipulated to permit the bag ring 96 to be separated from the seat 92. The arrangement, having secured the bag to the end cap, provides more bag area exposed to the bag space than is usually the case and, in addition, permits the bag to be positioned with its open end upward before being separated from the end cap so as to avoid spilling of the contents of the bag 22.

A gasket 102 secured to the outside of the fan chamber cover 44 engages the inside of the hood and forms a seal therewith so as to separate the space in the casing on the intake side of the fan from the discharge side thereof. The motor includes an armature 106 arranged for rotation on a horizontal axis on a shaft 108 which is journaled in bearings 110 and 112 carried by frame members 114 and 116. The frame members are provided with feet 118, each of which is supported on a bushing 120 arranged on the motor support 38 and secured thereto by means of bolts 122, extending through a foot 118, the bushing 120 and the motor support 38, and to the lower end of which a nut 124 is threadedly secured. The fan chamber 44 cooperates with a portion of the base to form an exhaust opening 130, and one end of the motor projects into such exhaust opening and is arranged so that air discharged from the fan through such opening flows through and over the motor for cooling the same. The shaft 108 projects into the fan chamber and has a fan 132 secured thereto in the fan chamber so that during operation of the motor, the fan 132 will effect the circulation of air through the cleaner and cool the motor in the manner previously described. The diameter of the motor is such and it is supported in such a manner that air which is discharged from the fan may flow over substantially all of the outside and inside surfaces of the field and the windings thereof.

A fine mesh filter 150 may be arranged across the casing in front of the fan so as to define the bag space and prevent the bag 22, which may be longer than the space it occupies, from fouling itself on the filter 48.

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

We claim:

1. A horizontal tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support and a cavity open at its upper end, said cavity forming the lower half of a fan chamber, said base member projecting forwardly of said fan chamber to form the lower part of a bag space upstream relative to said fan chamber; a cover secured to said base member and cooperating with said cavity to define a horizontal axis fan chamber and an inlet thereto communicating with said bag space, said cover cooperating with an integral portion of said base to form an exhaust opening from said fan chamber, a horizontal axis electric motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, one end of said motor projecting into said exhaust opening and arranged so that air discharged from said fan through said outlet flows through and over

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said motor, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of the bag space in front of said motor and fan, a bag in said bag space, said casing having an air inlet communicating with the interior of said bag, the exhaust opening of said fan chamber communicating with the exterior of said casing, and said fan and motor being arranged in said casing and being operative for effecting the circulation of air through said bag and casing.

2. A horizontal tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support and a cavity open at its upper end, said cavity forming the lower half of a fan chamber, said base member projecting forwardly of said fan chamber to form the lower part of a bag space upstream relative to said fan chamber, a cover secured to said base member and cooperating with said cavity to define a horizontal axis fan chamber and an inlet thereto communicating with said bag space, said cover cooperating with means on said base to form an exhaust opening from said fan chamber, a horizontal axis electric motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, one end of said motor projecting into said exhaust opening and arranged so that air discharged from said fan through said outlet flows over said motor, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of the bag space in front of said motor and fan, a bag in said bag space, said hood and base member defining an access opening to said bag space, a cap closing said bag access opening and having an air inlet communicating with the interior of said bag, said fan chamber exhaust opening communicating with the exterior of said casing, and said fan and motor being arranged in said casing and being operative for effecting the circulation of air through said bag and casing.

3. A horizontal tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral elevated portions providing a motor support and a cavity open at its upper end and arranged in front of said motor support, said cavity forming the lower half of a fan chamber, said base member having a flat portion projecting forwardly of said fan chamber to form the lower part of a bag space upstream relative to said fan chamber and having integral supporting runners extending along the sides of said base member, a cover secured to said base member and cooperating with said cavity to define a horizontal axis fan chamber and an inlet thereto communicating with said bag space, said cover cooperating with an integral portion of said base to form an exhaust opening from said fan chamber, a horizontal axis electric motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, said motor being arranged in line with said exhaust opening so that air discharged from said fan through said outlet flows over said motor, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of the bag space in front of said motor and fan, a bag in said bag space, said casing having an air inlet communicating with the interior of said bag, said fan

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chamber exhaust opening communicating with the exterior of said casing, and said fan and motor being arranged in said casing and being operative for effecting the circulation of air through said bag and casing.

4. A horizontal tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support and a cavity open at its upper end, said cavity forming the lower half of a fan chamber, said base member projecting forwardly of said fan chamber to form the lower part of a bag space upstream relative to said fan chamber, a cover secured to said base member and cooperating with said cavity to define a horizontal axis fan chamber, said fan chamber having an inlet thereto communicating with said bag space and an exhaust opening, a horizontal axis electric motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of the bag space in front of said motor and fan, a bag in said bag space, said casing having an air inlet communicating with the interior of said bag, said fan chamber exhaust opening communicating with the exterior of said casing, and said fan and motor being operative for effecting the circulation of air through said bag and casing.

5. A horizontal tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support and a cavity open at its upper end, said cavity forming the lower half of a fan chamber, said base member projecting forwardly of said fan chamber to form the lower part of a bag space upstream relative to said fan chamber, a cover secured to said base member and cooperating with said cavity to define a horizontal axis fan chamber, said fan chamber having an inlet thereto communicating with said bag space and an exhaust opening, a horizontal axis electric motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of the bag space in front of said motor and fan and an access opening to said bag space, a bag in said bag space, a removable cap closing said bag space access opening and having an air inlet communicating with the interior of said bag, said bag being secured to said cap so as to be removable therewith, said fan chamber exhaust opening communicating with the exterior of said casing, and said fan and motor being operative for effecting the circulation of air through said bag and casing.

6. A tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support, an upwardly facing fan chamber cavity, and supporting members for the cleaner, said base member extending laterally of said fan chamber to form the lower part of a bag space at one side of said fan chamber, a fan chamber cover member secured to said base member and cooperating with said cavity to define a fan chamber, a motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, a hood mounted on said base member and cooper-

ating therewith to define at least part of the casing of the cleaner which forms surrounding walls of a bag space at one side of said motor and fan, a bag in said bag space, said hood and base member forming an inlet to said bag space at one end of said cleaner, said fan chamber having an inlet communicating with said bag space and an outlet communicating with the exterior of said casing, said motor being arranged in the path of flow of air discharged by said fan, and a cap closing said bag space inlet, the inlet of said bag being secured to said cap and said cap having an air inlet leading to the interior of said bag.

7. A tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support, and an upwardly facing fan chamber cavity, said base member extending laterally of said fan chamber to form the lower part of a bag space at one side of said fan chamber, a fan chamber cover member secured to said base member and cooperating with said cavity to define a fan chamber, a motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of a bag space at one side of said motor and fan, said hood and base member forming an inlet to said bag space at one end of said cleaner, said fan chamber having an inlet communicating with said bag space and an outlet communicating with the exterior of said casing, said motor being arranged in the path of flow of air which flows through said fan, and a hollow cap removably seated on said base member and hood and closing said bag space inlet, a bag in said bag space, the inlet of said bag being secured in the hollow of said cap and forwardly of the joint between said cap and hood and base member and said cap having an air inlet leading to the interior of said bag.

8. A tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions providing a motor support, and an upwardly facing fan chamber cavity, said base member extending laterally of said fan chamber to form the lower part of a bag space at one side of said fan chamber, a fan chamber cover member secured to said base member over said cavity and cooperating with said base member to define a fan chamber, an inlet to said fan chamber and a seat for a filter, a motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, a filter on said seat and arranged to filter all of the air which flows into said fan chamber inlet, a hood mounted on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of a bag space at one side of said motor and fan, a bag in said bag space, said hood and base member forming an inlet to said bag space at one end of said cleaner, said fan chamber inlet communicating with said bag space, said fan chamber having an outlet communicating with the exterior of said casing, said motor being arranged in the path of flow of air which flows through said fan, and a cap closing said bag space inlet, and said cap having an air inlet leading to the interior of said bag.

9. A tank type suction cleaner comprising a molded plastic, generally flat, horizontally disposed base member formed with integral portions

providing a motor support, an upwardly facing fan chamber cavity, and a seat along the sides thereof, said base member extending laterally of said fan chamber to form the lower part of a bag space at one side of said fan chamber, a fan chamber cover member secured to said base member and cooperating with said cavity to define a fan chamber, a motor on said support and including a horizontal shaft having a fan thereon arranged in said fan chamber, a hood mounted on said seat on said base member and cooperating therewith to define at least part of the casing of the cleaner which forms surrounding walls of a bag space at one side of said motor and fan, a bag in said bag space, said hood and base member forming an inlet to said bag space at one end of said cleaner, said fan chamber having an inlet communicating with said bag space and an outlet communicating with the exterior of said casing, said motor being arranged in the path of flow of air which flows through said fan, and a cap closing said bag space inlet and having an air inlet leading to the interior of said bag.

10. In a tank type horizontally arranged suction cleaner, a casing having a bag space at one end thereof, means in said casing for effecting the circulation of air therethrough, said casing having an access opening to said bag space, a hollow cap seated on said casing around said opening for closing the same and having a continuous seat in the hollow of said cap, a bag, including a bag ring which defines the mouth of said bag, arranged in said bag space with said bag ring seated on said seat, means on and housed within said cap and including a displaceable shoulder engaging said bag ring for holding and securing the same on its seat independently of the seating of said cap on said casing, said bag ring and seat being arranged ahead of the joint between said cap and said casing, said access opening including a shoulder on one side thereof and a latch and said cap having keepers engageable with said shoulders and with said latch for securing said cap to said casing.

11. In a tank type horizontally arranged suction cleaner, a casing having a bag space at one end thereof, means in said casing for effecting the circulation of air therethrough, said casing having an access opening to said bag space, a hollow cap seated on said casing around said opening for closing the same and having a seat in the hollow of said cap, a bag, including a bag ring which defines the mouth of said bag, arranged in said bag space with said bag ring seated on said seat, and means on and housed within said cap and including a displaceable shoulder engaging said bag ring for holding and securing the same on its seat independently of the seating of said cap on said casing, said bag ring and seat being arranged ahead of the joint between said cap and said casing.

12. In a tank type horizontally arranged suction cleaner, a casing having a bag space, means in said casing for effecting the circulation of air therethrough, said casing having an access opening to said bag space, a hollow cap seated on said casing for closing said opening and having a seat in the hollow of said cap, a bag including a bag ring which defines the mouth of said bag arranged in said bag space with said bag ring seated on and secured to said seat, said bag ring and seat being arranged ahead of the joint between said cap and said casing, said access opening including a shoulder on one side thereof and a latch and said cap having keepers engageable

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with said shoulders and a keeper engageable with said latch for securing said cap to said casing, said keepers having means formed integrally therewith for securing said bag ring on its seat independently of the seating of said cap on said casing.

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