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(54) **Liquid bath vacuum cleaner**

Staubsauger mit Flüssigkeitsbad

Aspirateur à bain de liquide

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Description

FIELD OF THE INVENTION .

[0001] This invention concerns a liquid bath vacuum cleaner as set forth in the main claim.

[0002] The invention refers particularly to cleaning devices comprising a suction assembly associated with an accumulation container containing a liquid able to retain the dirt sucked in. A liquid bath vacuum cleaner having the features of the preamble of claim 1 is disclosed in US-A-5,908,493.

BACKGROUND OF THE INVENTION

[0003] The state of the art includes liquid bath vacuum cleaners comprising a suction assembly associated with an accumulation container containing a liquid, generally water, to which the dirt sucked in is conveyed and in which it is then retained.

[0004] To be more exact, in this type of vacuum cleaner, the particles of dirt and dust collected through a suction conduct connected to collection accessories of various types, arrive inside the accumulation container where a large part thereof is retained and mixes with the liquid contained therein.

[0005] On the contrary, the particles of dirt and dust drifting in the accumulation container, together with little drops of liquid, are sucked in by the depression created by the suction and conveyed inside separator means of a rotary type provided inside the accumulation container itself and normally coupled with the suction assembly.

[0006] The centrifugal force deriving from the rotation of said separator means causes the particles of dirt and dust to coalesce with the drops of water which are forced outwards, separating from the air which, on the contrary, is sucked upwards and discharged into the outside environment through appropriate apertures.

[0007] The agglomerated particles of dirt, dust and liquid, due to the effect of this centrifugal force, emerge from the separator means through appropriate peripheral slits, and fall onto the bottom of said accumulation container.

[0008] However, some of the particles remain inside the separator means and are deposited on the walls and/or infiltrate into the zone where the separator means and the suction assembly are coupled.

[0009] This causes encrustations to form which are extremely harmful because they close up the slits of the separator means which then need frequent maintenance and cleaning and, in the long term, they can compromise the efficiency of the vacuum cleaner.

[0010] The published Japanese patent applications JP-A-2-215434 and JP-A-2-215435 disclose liquid bath vacuum cleaners wherein a lateral feed conduit conveys the air taken in, which contains the dirt, towards the liquid in a lower container, which is shaped so as to define a cylindrical central body, hollow inside and arranged be-

low the suction assembly, and a circular peripheral chamber coaxial with the central body. After passing through the liquid bath, the air taken in is conveyed through the circular chamber into the central body, where there is a filter able to retain the dirt which has not been retained by the liquid. These vacuum cleaners have the disadvantage that they are not provided with means which make any possible drops, accidentally conveyed inside the central body, flow towards the lower liquid bath; said drops could pass from the central body to the suction assembly and damage it.

[0011] The present Applicant has designed, tested and embodied this invention to overcome these shortcomings and to obtain further advantages.

SUMMARY OF THE INVENTION

[0012] The invention is set forth and characterised in the main claim, while the dependent claims describe other characteristics of the invention.

[0013] A liquid bath vacuum cleaner according to the invention comprises at least a suction assembly able to create a suction depression inside an accumulation container provided with a lower compartment to contain the liquid able to retain the dirt and dust sucked in, and a hollow body arranged inside the accumulation container to define with the latter a chamber wherein the air taken in circulates, wherein the hollow body has a containing compartment communicating with the suction assembly.

[0014] One purpose of the invention is to achieve a liquid bath vacuum cleaner of the type described above, which is economical and functional, and which will allow an efficient filtering of the air sucked in, separating it from the particles of dirt and dust, and from the drops of liquid, before it is discharged.

[0015] Another purpose of the invention is to provide a liquid bath vacuum cleaner wherein the part of the liquid which possibly enters into the containing compartment of the hollow body can flow away automatically towards the lower compartment containing the liquid, in order to prevent the liquid from arriving at the suction assembly, and damage it. The suction assembly can therefore function in an optimum manner for long periods of time without needing frequent maintenance.

[0016] The vacuum cleaner according to the invention comprises separator means able to selectively and automatically put the containing compartment of the hollow body in communication with the lower compartment containing the liquid.

[0017] The separator means comprise a bottom wall of said hollow body, a through aperture made in said bottom wall and an element to close said through aperture.

[0018] The closing element is hinged on the lower part of the bottom wall of the hollow body and is able to keep the through aperture normally closed, due to the effect of the suction depression.

[0019] According to another characteristic of the inven-

tion, a transverse support is interposed between the hollow body and the lower compartment containing the liquid, to divide the liquid peripherally from the chamber wherein the sucked in air circulates.

[0020] The transverse support is mounted in removable fashion inside the accumulation container and is shaped so as to have a substantially horizontal circular crown and a central, lowered compartment defined by a lateral wall and its own bottom wall.

[0021] The latter is advantageously arranged below the level of the liquid and is provided with its own through aperture.

[0022] The bottom walls of the hollow body and the transverse support are substantially horizontal and define an interspace between them.

[0023] On the peripheral edge of the transverse support there is a sealing packing able to prevent the liquid from entering the chamber wherein the sucked in air circulates, along the walls of the accumulation container.

[0024] According to a variant, in the interspace which is created below the bottom wall of the hollow body, a plurality of radial fins are advantageously arranged, located around an axial cavity, communicating with the lower compartment of the accumulation container, and defining peripherally a plurality of outlet channels to convey the air towards peripheral apertures.

[0025] Inside the containing compartment of the hollow body there is a safety float able to close the inlet mouth of the suction assembly.

[0026] In the upper part of the chamber wherein the sucked in air circulates, associated with the hollow body, there are prevention means able to prevent drops of liquid from rising to the top of said chamber. The prevention means, which comprise a plate, are arranged below lateral apertures made on the lateral wall of the hollow body, to put the chamber wherein the air sucked in circulates in communication with the containing compartment of the latter.

[0027] When the vacuum cleaner according to the invention is functioning, the particles of dirt and dust transported by the air sucked in are conveyed towards the lower compartment of the accumulation container, where they come into contact with the liquid contained therein.

[0028] The air sucked in then passes through the interspace formed by the bottom walls of the hollow body and the transverse support, entering from the inlet axial cavity and exiting from the peripheral apertures, possibly passing between the radial fins. In this path, the air sucked in creates turbulence inside the liquid, separating from the latter and rising up the circulation chamber until, after having passed through the containing compartment of the hollow body, it reaches the suction assembly by means of which it is then discharged.

[0029] In the event that the drops of liquid rise up the circulation chamber together with the air sucked in, and accumulate beyond a certain pre-set level on the bottom of the containing compartment, the float inside the latter provides to close the inlet mouth of the suction assembly

and prevents it from being damaged, while the closing element located on the lower part of the bottom wall of the hollow body automatically opens and allows the liquid to flow towards the lower compartment of the accumulation container.

[0030] With this simple and economical solution, the vacuum cleaner according to the invention thus achieves an efficient filtration of the air sucked in, by means of autonomous separator means which are distanced from the suction assembly; the latter is therefore adequately protected, also because of the safety float system.

[0031] Moreover, the turbulence caused by the air sucked in provides to continuously remove the dirt and dust from the separator means, which thus require less frequent maintenance and cleaning.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] These and other characteristics of the invention will become clear from the following description of a preferential form of embodiment, given as a non-restrictive example, with reference to the attached drawings wherein:

- Fig. 1 is a longitudinal section of a liquid bath vacuum cleaner according to the invention;
- Fig. 2 is a section from A to A of Fig. 1;
- Fig. 3 shows a first enlarged detail of the liquid bath vacuum cleaner as in Fig. 1 during the suction operation;
- Fig. 4 shows the detail of Fig. 3 with no suction;
- Fig. 5 is a section from B to B of Fig. 1;
- Fig. 6 shows a second enlarged detail of the liquid bath vacuum cleaner as in Fig. 1.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0033] With reference to the attached Figures, a liquid bath vacuum cleaner 10 according to the invention comprises a suction assembly 11 (shown only schematically with a line of dashes) associated with an accumulation container 12, substantially cylindrical in shape, which has, near its bottom wall 12a, a compartment 35 to contain a liquid 13 able to retain the dirt and dust sucked in.

[0034] The liquid 13, which may simply consist of water, advantageously reaches a defined level 13a.

[0035] The suction assembly 11, of a substantially conventional type, comprises an electric motor able to make a fan rotate, the fan being suitable to generate, inside the accumulation container 12, the depression which achieves the functioning of the vacuum cleaner 10.

[0036] The accumulation container 12 is provided at the side with an inlet aperture 14 with which the accessories to collect the dirt and dust (hoses, brushes, lances, etc.) are able to be connected, of a conventional type and therefore not shown in the drawings.

[0037] Inside the accumulation container 12, the inlet

aperture 14 is associated with a conveyor conduit 15, the lower end 15a of which is located near the bottom wall 12a of the accumulation container 12, advantageously just above the level 13a of the liquid 13.

[0038] The conveyor conduit 15 can vary in length, and may consist for example of two or more pieces which can be moved axially one with respect to the other in telescopic fashion.

[0039] Inside the accumulation container 12 there is a hollow body 16 which extends below an inlet mouth 11a of the suction assembly 11. Between the accumulation container 12 and the hollow body 16 is defined a circular chamber 23 wherein the sucked in air circulates, after it has passed through the liquid bath 13.

[0040] The hollow body 16 defines inside a containing compartment 17 in which a float 18 is housed, the float 18 being constrained in suspension to an annular collar 19 attached to the inlet mouth 11a.

[0041] The float 18 comprises a plurality of ribs 18a, arranged radially and substantially vertical, connected at the lower part by a base 18b and is able to slide upwards inside the annular collar 19.

[0042] A filter 21, open at the lower part and developing around the float 18, is attached outside the annular collar 19.

[0043] The hollow body 16 rests its lower part on a transverse support 22 (Figs. 1 and 5), which is mounted in a removable fashion inside the accumulation container 12 and is shaped so that it has a circular crown 36, substantially horizontal, and a central compartment 37 lowered and defined by a lateral wall 38 and a bottom wall 39, advantageously arranged below the level 13a of the liquid 13.

[0044] The transverse support 22 is provided with a lateral aperture 40 in which the lower end part 15a of the conveyor conduit 15 is normally housed.

[0045] On the peripheral edge of the circular crown 36 and the lateral aperture 40 there is a sealing packing 41 (Figs. 1, 5 and 6), for example made of rubber, which is able to prevent the liquid 13 from entering the circular chamber 23 along the walls of the accumulation container 12.

[0046] The hollow body 16 is provided in its upper section with one or more lateral apertures 24 by means of which the circular chamber 23 communicates with the containing compartment 17.

[0047] Below the lateral apertures 24 the hollow body 16 is provided with a plate 25, which develops outside over the whole perimeter of the hollow body 16 and is inclined towards the bottom wall 12a of the accumulation container 12, thus defining a peripheral narrowing of the circular chamber 23.

[0048] The function of the plate 25 is to retain any possible drops of water still present in the air rising along the circular chamber 23, and make them fall downwards.

[0049] The hollow body 16 also comprises a bottom wall 16a, substantially horizontal, located in a higher position with respect to the bottom wall 39 of the transverse

support 22, so as to define an interspace 26. Peripheral apertures 42 make the interspace 26 communicate with the circular chamber 23.

[0050] The interspace 26 comprises at the center an axial cavity 28, communicating with the lower compartment 35 of the accumulation container 12 through an aperture 22a made in the bottom wall 39 of the transverse support 22.

[0051] Inside the interspace 26, around the axial cavity 28, radial fins 27, possibly made in a piece therewith, may be arranged.

[0052] In the embodiment shown in Fig. 2, there are eight radial fins 27 which advantageously have a curved longitudinal development, even though they may also be different both in shape and in number.

[0053] With the bottom wall 16a of the hollow body 16 and the bottom wall 39 of the transverse support 22, the radial fins 27 define a plurality of channels 29 which make the axial cavity 28 communicate with the circular chamber 23, through the peripheral apertures 42.

[0054] According to a characteristic feature of the invention, in the bottom wall 16a there is a through hole 31, which makes the axial cavity 28 communicate with the containing compartment 17 of the hollow body 16. A corresponding discharge window 30 hinges, by means of a hinge 32, on the lower part of the bottom wall 16a and is able to open or close the through hole 31 according to the pressure conditions inside the accumulation container 12.

[0055] To be more exact, the discharge window 30 is able to assume a closed position when there is a depression inside the containing compartment 17 of the hollow body 16 (Fig. 3), and an open position when there is no depression (Fig. 4).

[0056] When the vacuum cleaner 10 is functioning, the suction assembly 11 creates a depression inside the containing compartment 17 of the hollow body 16 and, through the lateral apertures 24, also in the circular chamber 23 of the accumulation container 12, generating a flow of air through the conveyor conduit 15 which sucks in the dirt and dust, making them flow towards the liquid 13.

[0057] When the flow of air, mixed with dirt and dust, comes into contact with the liquid 13, most of the particles of dirt and dust are retained in said liquid 13, whereas the air flows towards the interspace 26 through the aperture 22a.

[0058] To be more exact, the air passes through the axial cavity 28 and, possibly lapping the surfaces of the radial fins 27, emerges into the circular chamber 23 through the peripheral apertures 42.

[0059] Due to the arrangement of the radial fins 27, the air as it passes creates a turbulence in the liquid 13 which facilitates the detachment and separation of the residual drops of liquid 13 and the particles of dirt and dust.

[0060] The curved shape of the radial fins 27, moreover, generates a particularly efficacious centrifugal effect

which encourages this separation of the drops and the particles of dirt and dust, conveying them towards the outside and thus making it easier for the air to rise towards the top of the circular chamber 23.

[0061] During this ascent, the nebulized liquid 13 and any possible particles still present in the air mostly hit the plate 25, while the air itself enters the containing compartment 17 through the lateral apertures 24.

[0062] After passing through the filter 21 which provides to retain the residual substances still present in it, the air passes between the ribs 18a of the float 18 and rises towards the inlet mouth 11a of the suction assembly 11, which then provides to discharge it in a conventional manner through an outlet aperture not shown in the drawings.

[0063] In the event that a part of the liquid 13 manages to enter inside the hollow body 16, and settle on its bottom wall 16a, it is discharged and automatically returned to the underlying interspace 26 through the through hole 31.

[0064] When there is a certain quantity of liquid 13 above the bottom wall 16a, the discharge window 30 is no longer affected by the depression created by the suction assembly 11 inside the containing compartment 17, and indeed is subjected to the pressure of the liquid 13 above; therefore it automatically opens downwards (Fig. 4), making said liquid 13 flow into the interspace 26.

[0065] When the discharge window 30 does not open and the liquid 13 reaches the base 18b of the float 18, the latter rises inside the annular collar 19, and closes the inlet mouth 11a of the suction assembly 11.

[0066] In this condition, there is no longer any depression inside the accumulation container 12 and the containing compartment 17 in particular, and therefore the discharge window 30 moves to the open position and makes the liquid 13 flow away.

[0067] In the event that the discharge window 30 does not open, the vacuum cleaner 10 does not allow to suck in any dirt and dust; the user necessarily notices this and can then intervene to restore normal working conditions of the apparatus.

[0068] The suction assembly 11 is thus protected from contact with the liquid 13 in all conditions, and the vacuum cleaner 10 is protected from any possible damage resulting from such contact.

[0069] It is obvious that modifications and/or additions may be made to the vacuum cleaner 10 as described heretofore, but these shall remain within the field and scope of this invention.

[0070] It is also obvious that, although the invention has been described with reference to a specific example, a person of skill in the art shall certainly be able to achieve many other equivalent applications of the vacuum cleaner described above, but these shall all come within the field and scope of this invention.

Claims

1. Liquid bath vacuum cleaner (10) comprising at least a suction assembly (11) able to create a suction depression inside an accumulation container (12) provided with a lower compartment (35) containing a liquid (13) able to retain the dirt and dust sucked in, a hollow body (16) arranged inside said accumulation container (12) to define with the latter a chamber (23) wherein the air sucked in circulates, said hollow body (16) having a containing compartment (17) in communication with said suction assembly (11), separator means (30, 31) being able to make said containing compartment (17) selectively communicate with said lower compartment (35) to make the part of said liquid (13) which possibly enters said containing compartment (17) flow towards said lower compartment (35), **characterised in that** said separator means comprise a first bottom wall (16a) of said hollow body (16), a through aperture (31) made in said first bottom wall (16a) and a closing element (30) to close said through aperture (31).
2. Vacuum cleaner as in Claim 1, **characterised in that** said closing element (30) is hinged on the lower part of said first bottom wall (16a) and is able to hold said through aperture (31) normally closed due to the effect of said suction depression.
3. Vacuum cleaner as in Claim 1, **characterised in that** a transverse support (22) is interposed between said hollow body (16) and said lower compartment (35) to divide peripherally said liquid (13) from said chamber (23).
4. Vacuum cleaner as in Claim 3, **characterised in that** said transverse support (22) is mounted in a removable fashion inside said accumulation container (12) and is shaped in such a way as to have a substantially horizontal circular crown (36) and a central compartment (37) lowered and defined by a lateral wall (38) and by a second bottom wall (39).
5. Vacuum cleaner as in Claim 4, **characterised in that** said second bottom wall (39) is advantageously arranged below the level of said liquid (13) and is provided with a second through aperture (22a).
6. Vacuum cleaner as in Claim 3, **characterised in that** said transverse support (22) is provided with a lateral aperture (40) in which a conduit (15) to convey the air sucked in is normally housed.
7. Vacuum cleaner as in Claim 3, **characterised in that** on the peripheral edge of said transverse support (22) a sealing packing (41) is arranged able to prevent said liquid (13) from entering said chamber (23) along the walls of said accumulation container

- (12).
8. Vacuum cleaner as in Claims 1 and 4, **characterised in that** said first and second bottom walls (16a, 39) are substantially horizontal and define an interspace (26) between them. 5
9. Vacuum cleaner as in Claim 8, **characterised in that** a plurality of fixed fins (27) are arranged inside said interspace (26) and define an axial cavity (28) into which the air sucked in enters and peripheral channels (29) through which the air sucked in exits and which connect said axial cavity (28) with said chamber (23). 10
10. Vacuum cleaner as in Claim 9, **characterised in that** said fins (27) are arranged radially with respect to said axial cavity (28) and lie on a substantially horizontal plane. 15
11. Vacuum cleaner as in Claim 9, **characterised in that** said first and second bottom walls (16a, 22) close said peripheral channels (29) above and below. 20
12. Vacuum cleaner as in Claim 9, **characterised in that** said fins (27) have a curved longitudinal development. 25
13. Vacuum cleaner as in Claim 1, **characterised in that** safety means are arranged inside said containing compartment to close an inlet (11a) of said suction assembly (11) to prevent contact with said liquid (13). 30
14. Vacuum cleaner as in Claim 13, **characterised in that** said safety means comprise a floating element (18) able to rise to close said inlet (11a) of said suction assembly (11) when there is a certain quantity of liquid (13) on the bottom wall (16a) of said hollow body (16). 35
15. Vacuum cleaner as in Claim 14, **characterised in that** said float (18) is guided by an element (19) associated with the inlet (11a) of said suction assembly (11). 40
16. Vacuum cleaner as in Claim 1, **characterised in that** said hollow body (16) comprises inside itself filter means (21) to purify the air sucked in. 45
17. Vacuum cleaner as in Claims 14 and 16, **characterised in that** said floating element (18) is open at the side and that said filter means (21) are arranged on the perimeter thereof. 50
18. Vacuum cleaner as in Claim 1, **characterised in that** prevention means (25) are provided to prevent

drops of said liquid (13) from rising to the top of said chamber (23).

19. Vacuum cleaner as in Claim 18, **characterised in that** said prevention means comprise a plate (25) defining a peripheral narrowing of said chamber (23). 5
20. Vacuum cleaner as in Claim 19, **characterised in that** said plate (25) is inclined towards the bottom wall (12a) of said accumulation container (12). 10
21. Vacuum cleaner as in Claim 19, **characterised in that** said plate (25) is made on the perimeter of said hollow body (16). 15

Patentansprüche

1. Staubsauger (10) mit Flüssigkeitsbad, mit mindestens einer Sauganordnung (11) zur Erzeugung eines Saugdrucks innerhalb eines Sammelbehälters (12), der mit einem eine Flüssigkeit (13) zum Zurückhalten von abgesaugtem Schmutz und Staub enthaltenden unteren Raum (35) versehen ist, wobei in dem Sammelbehälter (12) ein Hohlkörper (16) angeordnet ist, der darin eine Kammer (23) bildet, in der die angesaugte Luft zirkuliert, wobei der Hohlkörper (16) einen mit der Sauganordnung (11) kommunizierenden Aufnahmeraum (17) aufweist und eine Trenneinrichtung (30, 31) den Aufnahmeraum (17) selektiv mit dem unteren Raum (35) verbindet, um den Teil der Flüssigkeit (13), der möglicherweise in den Aufnahmeraum (17) gelangt, in den unteren Raum (35) strömen kann, **dadurch gekennzeichnet, dass** die Trenneinrichtung eine erste Bodenwand (16a) des Hohlkörpers (16), eine in dieser vorhandene Durchgangsöffnung (31) und ein Schließelement (30) zum Schließen der Durchgangsöffnung (31) aufweist. 20
2. Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass** das Schließelement (30) am unteren Teil der ersten Bodenwand (16a) angelenkt und so gestaltet ist, dass es die Durchgangsöffnung (31) unter der Wirkung des Saugdrucks normalerweise geschlossen hält. 25
3. Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass** zwischen dem Hohlkörper (16) und dem unteren Raum (15) ein Querträger (22) eingefügt ist, der die Flüssigkeit (13) in Umfangsrichtung von der Kammer (23) trennt. 30
4. Staubsauger nach Anspruch 3, **dadurch gekennzeichnet, dass** der Querträger (22) herausnehmbar in dem Sammelbehälter (12) montiert und so gestaltet ist, dass er einen im wesentlichen horizontalen kreisförmigen Kranz (36) und einen von einer Sei-

tenwand (38) und einer zweiten Bodenwand (39) definierten abgesenkten mittigen Raum (37) aufweist.

5. Staubsauger nach Anspruch 4, **dadurch gekennzeichnet, dass** die zweite Bodenwand (39) vorteilhafterweise unter dem Pegel der Flüssigkeit (13) angeordnet und mit einer zweiten Durchgangsöffnung (22a) versehen ist. 5
6. Staubsauger nach Anspruch 3, **dadurch gekennzeichnet, dass** der Querträger (22) mit einer seitlichen Öffnung (40) versehen ist, in der sich normalerweise eine Leitung (15) zur Zuführung der angesaugten Luft befindet. 10
7. Staubsauger nach Anspruch 3, **dadurch gekennzeichnet, dass** an der Umfangskante des Querträgers (22) eine Dichtung (41) angeordnet ist, die verhindert, dass die Flüssigkeit (13) längs den Wänden des Sammelbehälters (12) in die Kammer (23) gelangt. 20
8. Staubsauger nach Anspruch 1 und 4, **dadurch gekennzeichnet, dass** die erste und die zweite Bodenwand (16a, 39) im wesentlichen horizontal verlaufen und zwischen sich einen Zwischenraum (26) definieren. 25
9. Staubsauger nach Anspruch 8, **dadurch gekennzeichnet, dass** in dem Zwischenraum (26) mehrere Rippen (27) angeordnet sind, die einen axialen Hohlraum (28), in den die angesaugte Luft eintritt, und Umfangskanäle (29) bilden, durch die die angesaugte Luft austritt und die den axialen Hohlraum (28) mit der Kammer (23) verbinden. 30
10. Staubsauger nach Anspruch 9, **dadurch gekennzeichnet, dass** die Rippen (27) bezüglich des axialen Hohlraums (28) radial verlaufen und in einer im wesentlichen horizontalen Ebene liegen. 40
11. Staubsauger nach Anspruch 9, **dadurch gekennzeichnet, dass** die erste und die zweite Bodenwand (16a, 22) die Umfangskanäle (29) oben und unten verschließen. 45
12. Staubsauger nach Anspruch 9, **dadurch gekennzeichnet, dass** die Rippen (27) in Längsrichtung gekrümmt verlaufen. 50
13. Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass** in dem Aufnahmeraum eine Sicherheitseinrichtung angeordnet ist, die einen Einlass (11a) der Sauganordnung (11) verschließt, um Kontakt mit der Flüssigkeit (13) zu verhindern. 55
14. Staubsauger nach Anspruch 13, **dadurch gekennzeichnet, dass** die Sicherheitseinrichtung einen

Schwimmer (18) aufweist, der ansteigt und den Einlass (11a) der Sauganordnung (11) verschließt, wenn sich auf der Bodenwand (16a) des Hohlkörpers (16) eine bestimmte Menge an Flüssigkeit (13) befindet.

15. Staubsauger nach Anspruch 14, **dadurch gekennzeichnet, dass** der Schwimmer (18) von einem dem Einlass (11a) der Sauganordnung (11) zugeordneten Bauelement (19) geführt ist.
16. Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass** der Hohlkörper (16) eine innere Filtereinrichtung (21) zum Reinigen der angesaugten Luft enthält.
17. Staubsauger nach Anspruch 14 und 16, **dadurch gekennzeichnet, dass** der Schwimmer (18) an der Seite offen und die Filtereinrichtung (21) an dessen Umfang angeordnet ist.
18. Staubsauger nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Schutzeinrichtung (25) vorgesehen ist, die verhindert, dass Tropfen der Flüssigkeit (13) an das obere Ende der Kammer (23) gelangen.
19. Staubsauger nach Anspruch 18, **dadurch gekennzeichnet, dass** die Schutzeinrichtung eine Platte (25) aufweist, die eine Verengung der Kammer (23) am Umfang bildet.
20. Staubsauger nach Anspruch 19, **dadurch gekennzeichnet, dass** die Platte (25) in Richtung der Bodenwand (12a) des Sammelbehälters (12) geneigt ist.
21. Staubsauger nach Anspruch 19, **dadurch gekennzeichnet, dass** die Platte (25) am Umfang des Hohlkörpers (16) ausgebildet ist.

Revendications

1. Aspirateur à bain de liquide (10) comprenant au moins une structure d'aspiration (11) apte à créer une dépression d'aspiration à l'intérieur d'un récipient d'accumulation (12) doté d'un compartiment inférieur (35) contenant un liquide (13) apte à retenir la saleté et la poussière aspirées, un corps creux (16) disposé à l'intérieur dudit récipient d'accumulation (12) pour définir avec ce dernier une chambre (23) dans laquelle circule l'air aspiré, ledit corps creux (16) comportant un compartiment de rétention (17) en communication avec ladite structure d'aspiration (11), des moyens séparateurs (30, 31) permettant de faire communiquer sélectivement ledit compartiment de rétention (17) avec ledit comparti-

- ment inférieur (35) pour permettre à la partie dudit liquide (13) pénétrant éventuellement dans ledit compartiment de rétention (17) de s'écouler vers ledit compartiment inférieur (35), **caractérisé en ce que** lesdits moyens séparateurs comprennent une première paroi de fond (16a) dudit corps creux, une ouverture traversante (31) pratiquée dans ladite première paroi de fond (16a) et un élément de fermeture (30) destiné à fermer ladite ouverture traversante (31).
2. Aspirateur selon la revendication 1, **caractérisé en ce que** ledit élément de fermeture (30) est articulé sur la partie inférieure de ladite première paroi de fond (16a) et est capable de maintenir ladite ouverture traversante (31) normalement fermée sous l'effet de ladite dépression d'aspiration.
 3. Aspirateur selon la revendication 1, **caractérisé en ce qu'un** support transversal (22) est intercalé entre ledit corps creux (16) et ledit compartiment inférieur (35) afin de séparer périphériquement ledit liquide (13) de ladite chambre (23).
 4. Aspirateur selon la revendication 3, **caractérisé en ce que** ledit support transversal (22) est monté de façon amovible à l'intérieur dudit récipient d'accumulation (12) et est formé de manière à présenter une couronne circulaire sensiblement horizontale (36) et un compartiment central (37) abaissé et défini par une paroi latérale (38) et par une seconde paroi de fond (39).
 5. Aspirateur selon la revendication 4, **caractérisé en ce que** ladite seconde paroi de fond (39) est avantageusement disposée sous le niveau dudit liquide (13) et est dotée d'une seconde ouverture traversante (22a).
 6. Aspirateur selon la revendication 3, **caractérisé en ce que** ledit support transversal (22) est doté d'une ouverture latérale (40) dans lequel est normalement ménagé un conduit (15) destiné à véhiculer l'air aspiré.
 7. Aspirateur selon la revendication 3, **caractérisé en ce qu'une** garniture d'étanchéité (41) est disposée sur le bord périphérique dudit support transversal (22), afin d'empêcher ledit liquide (13) de pénétrer dans ladite chambre (23) le long des parois dudit récipient d'accumulation (12).
 8. Aspirateur selon les revendications 1 et 4, **caractérisé en ce que** lesdites première et seconde parois de fond (16a, 39) sont sensiblement horizontales et définissent entre elles un intervalle (26).
 9. Aspirateur selon la revendication 8, **caractérisé en ce qu'une** pluralité d'ailettes fixes (27) est disposée à l'intérieur dudit intervalle (26) et définit une cavité axiale (28), à l'intérieur de laquelle pénètre l'air aspiré, et des canaux périphériques (29) par lesquels sort l'air aspiré et qui relient ladite cavité axiale (28) à ladite chambre (23).
 10. Aspirateur selon la revendication 9, **caractérisé en ce que** lesdites ailettes (27) sont disposées radialement par rapport à ladite cavité axiale (28) et reposent sur un plan sensiblement horizontal.
 11. Aspirateur selon la revendication 9, **caractérisé en ce que** lesdites première et seconde parois de fond (16a, 22) ferment lesdits canaux périphériques (29) au-dessus et en dessous.
 12. Aspirateur selon la revendication 9, **caractérisé en ce que** lesdites ailettes (27) présentent un développement longitudinal incurvé.
 13. Aspirateur selon la revendication 1, **caractérisé en ce que** des moyens de sécurité sont disposés à l'intérieur dudit compartiment de rétention pour fermer une entrée (11a) de ladite structure d'aspiration (11) afin d'empêcher le contact avec ledit liquide (13).
 14. Aspirateur selon la revendication 13, **caractérisé en ce que** lesdits moyens de sécurité comprennent un élément flottant (18) capable de monter pour fermer ladite entrée (11a) de ladite structure d'aspiration (11) lorsqu'il se trouve une certaine quantité de liquide (13) sur la paroi de fond (16a) dudit corps creux (16).
 15. Aspirateur selon la revendication 14, **caractérisé en ce que** ledit flotteur (13) est guidé par un élément (19) associé à l'entrée (11a) de ladite structure d'aspiration (11).
 16. Aspirateur selon la revendication 1, **caractérisé en ce que** ledit corps creux (16) renferme des moyens de filtration (21) destinés à purifier l'air aspiré.
 17. Aspirateur selon les revendications 14 et 16, **caractérisé en ce que** ledit élément flottant (18) est ouvert sur le côté et que lesdits moyens de filtration (21) sont disposés sur le périmètre de celui-ci.
 18. Aspirateur selon la revendication 1, **caractérisé en ce que** des moyens de prévention (25) sont prévus pour empêcher des gouttes dudit liquide (13) de monter jusqu'au sommet de ladite chambre (23).
 19. Aspirateur selon la revendication 18, **caractérisé en ce que** lesdits moyens de prévention comprennent une plaque (25) définissant un resserrement périphérique de ladite chambre (23).

20. Aspirateur selon la revendication 19, **caractérisé en ce que** ladite plaque (25) est inclinée vers la paroi de fond (12a) dudit récipient d'accumulation (12).

21. Aspirateur selon la revendication 19, **caractérisé en ce que** ladite plaque (25) est réalisée sur le périmètre dudit corps creux (16).

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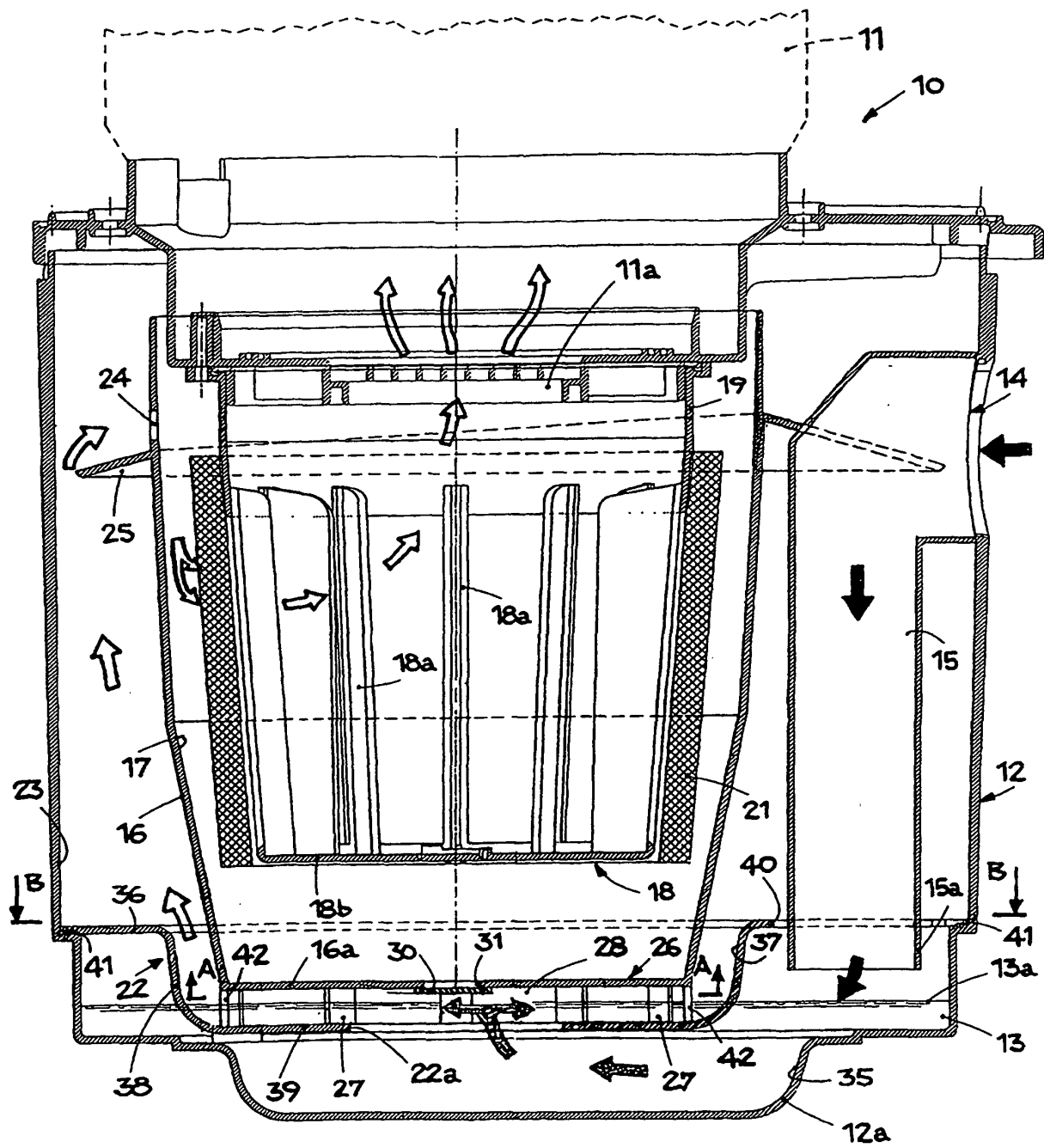


fig.1

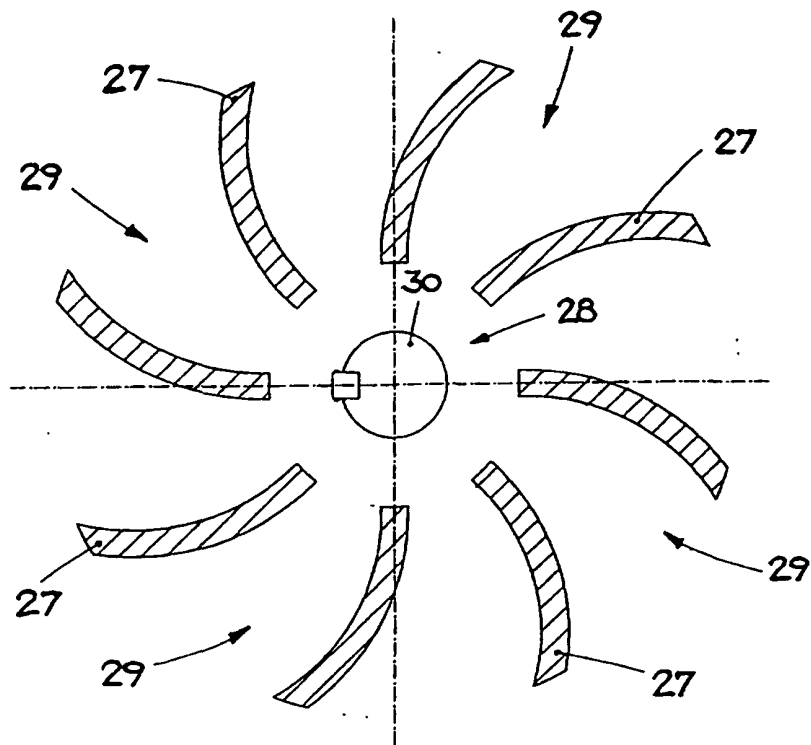


Fig. 2

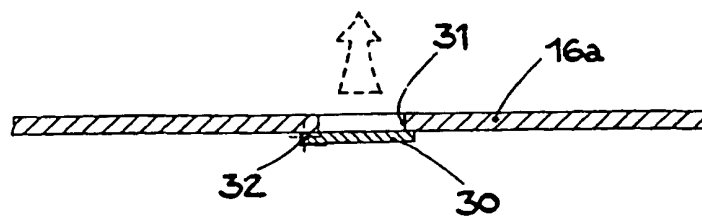


Fig. 3

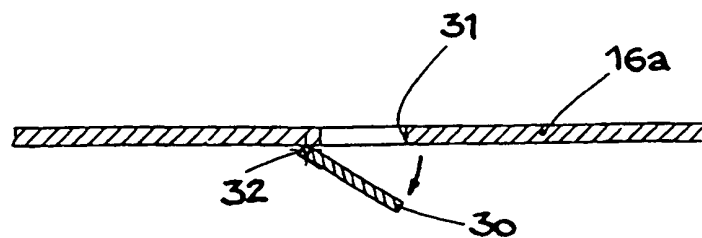


Fig. 4

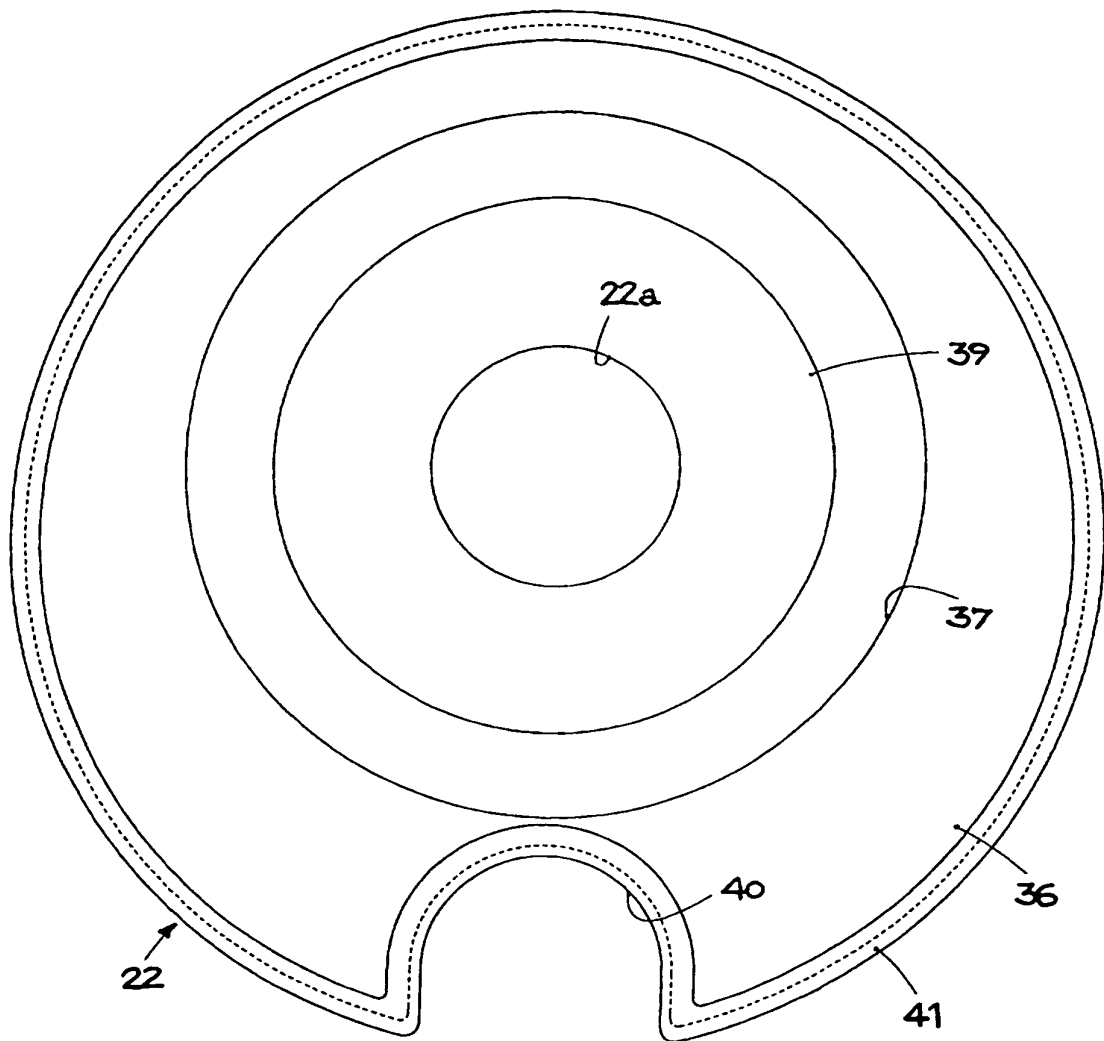


fig. 5

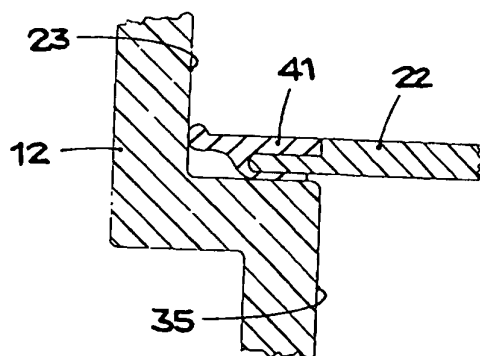


fig. 6