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(54) **VACUUM CLEANER FILTRATION SYSTEM**

STAUBSAUGERFILTRATIONSSYSTEM

SYSTEME DE FILTRATION POUR ASPIRATEUR

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Description

TECHNICAL FIELD

[0001] The present invention relates to a vacuum cleaner comprising at least one dust collector and at least one fan motor, said collector being arranged inside a dust compartment and comprising means for collecting particles brought into said collector by an air stream generated by said fan motor. Said air stream is flowing into said cleaner substantially through a cleaner inlet and flowing out from said cleaner substantially through a cleaner outlet, whereby said stream during its flow through said cleaner is guided through a path connecting said cleaner inlet with said cleaner outlet, at least one first inner outlet and one second inner outlet being arranged in said path.

BACKGROUND

[0002] The market for Vacuum Cleaner is moving towards a direction of divergence. There are different Vacuum Cleaners providing solutions for a wide variety of needs. Therefore, manufactures now often speak about different market segments. A Vacuum Cleaner directed towards a certain segment should provide a promise to the consumers of this segment. Such a promise could be a user-friendly machine or a light machine. Moreover, corresponding with the market segments, the vacuum cleaners are positioned into different price segments. The consumers which in some senses may feel belonging to one segment may also be prepared to invest a certain amount of money for a vacuum cleaner directed towards this segment since it at least partly fulfills his/her needs. Electrolux intention and target it therefore to provide vacuum cleaners in each of these identified segments in order to satisfy the needs for all kind of customers.

[0003] One such segment is the Health segment and the core needs within this segment is health and hygiene. It is very important that a vacuum cleaner provided for this segment limits the exposure to the user of dirt and bad smell. Therefore this vacuum cleaner should provide solutions to solve these problems. The core would therefore be to develop vacuum cleaners with features giving the user the promise of healthy use with a fresh result and usage with proven result.

[0004] Another segment is the User-friendly segment. A vacuum cleaner provided for this segment should be equipped with features for easy use. Solutions solving the problems of changing the dust bag, easy access to accessories and better wheels will give a promise of easy to use. Moreover the product equipped with ergonomic features like pivoting back saver handle, a backsaver tube, foot-operated pedals and the auto cord rewinder will increase the level of promise.

[0005] A problem with present vacuum cleaners provided for these two segments is that they do not give enough promise to the consumer, meaning that they do

not solve the needs to the extent that is required for these segments. For instance, the outlet air stream from the machine often brings bad smell and dust, which is spread into the room and recognized by the user. The user therefore often feels that the expose of the air stream increases the risk for more allergens. Moreover, the exhaust filter provided at the outlet needs to be exchanged regularly which causes problems with rinsing etc. One other problem with present vacuum cleaners is the high-speed air stream flowing upwards out of the vacuum cleaner. The air stream often hits the face of the user which of course is not appreciated. Moreover, the machines are often difficult to move and handle because of its wide shape and heavy weight, which gives ergonomic problem for the user.

[0006] The target for Electrolux would therefore be to create a vacuum cleaner that generates freshness in such a way that the user feels a need to clean the bedroom before going to bed in order to refresh the room. The cleaner should be in world class in terms of dust emission and give visible results of cleanliness, both on carpets and hard floor.

[0007] One problem that needs to be solved is to achieve a better level of filtration and dust emission. In present vacuum cleaners the level of filtration does not give enough promise to the consumers of the Health segment. Therefore, the object of the present invention is to solve this problem and provide a filtration solution which provides a higher level of filtration and thereby gives better promise to the consumer. Moreover, the filtration solution should be user-friendly, meaning that the filter handling should be easy for the user and that there should be an avoidance of clogged filter lowering the efficiency of the vacuum cleaner.

[0008] One solution for achieving a high level of filtration is disclosed in WO 96/15708 A1, where two filters are used. One filter is arranged upstream of the motor and the other downstream of the motor. The filters are connected to each other, in order to make the user change both filters at the same time.

[0009] Another solution is disclosed in EP 1177757, which discloses a vacuum cleaner with a pre-motor filter and a post-motor filter.

SUMMARY OF THE PRESENT INVENTION

[0010] The present invention relates to vacuum cleaner comprising at least one dust collector and at least one fan motor placed inside a motor housing (10). Said collector being arranged inside a dust compartment and comprising means for collecting particles brought into said collector by an air stream generated by said fan motor, said air stream flowing into said cleaner substantially through a cleaner inlet and flowing out from said cleaner substantially through a cleaner outlet (43). Whereby said stream during its flow through said cleaner is guided through a path connecting said cleaner inlet with said cleaner outlet (43), at least one first inner outlet (25) and

second inner outlet (33) being arranged in said path, wherein said second inner outlet is a motor housing outlet (33). Said vacuum cleaner comprises a first filter (13), removably arranged at said first inner outlet (25), and a second filter (14), arranged at said motor housing outlet (33), wherein said second filter (14) is an exhaust filter (14). Said exhaust filter comprises a frame (38) having extending parts (40) to receive a filter sealing (1.6), so that the frame will not be able to move out through the motor housing outlet (33). The frame (38) comprises hooks (41), the hooks cooperates with the motor housing outlet (33) so that the hooks (41) hook on an outlet edge (42) of said motor housing outlet (33), and the exhaust filter (14) rests at the motor housing outlet (33) inside the motor housing (10).

DESCRIPTION OF FIGURES

[0011] The invention is described in more detail in conjunction with the preferred embodiments and with reference to the enclosed drawings:

Fig. 1 shows a front perspective view of a vacuum cleaner body in which the features of the present invention are arranged.

Fig. 2 shows an exploded view of important parts in relation to the present invention.

Fig. 3 shows a front perspective view of the dust container according to the present invention as shown in fig. 2.

Fig. 4 shows a front perspective view of the motor filter according to the present invention as shown in fig. 2.

Fig. 5 shows a front perspective view of the motor housing according to the present invention as shown in fig. 2.

Fig. 6 shows a front perspective view of the exhaust filter according to the present invention as shown in fig. 2.

Fig. 7 shows a front perspective view of the frame of the exhaust filter according to fig. 6.

Fig. 8 shows a second exploded view according to the present invention as shown in fig. 2.

DESCRIPTION OF AN ILLUSTRATIVE EMBODIMENT

[0012] The figures show a preferred embodiment of a vacuum cleaner in accordance with the invention. The preferred embodiment shall not be interpreted as a limitation of the invention but rather has the aim of concretely illustrate a type of cleaner in which the invention can be

applied. This is to further illustrate the thought behind the invention.

[0013] In fig. 1 a vacuum cleaner body is shown. This figure intends to illustrate an embodiment of a vacuum cleaner in which the features of the present invention could be included. In relation to fig. 8, the body will be described more in details.

[0014] Fig. 2 shows an illustrative embodiment of a vacuum cleaner according to the present invention. In the figure, the outer walls of the cleaner according to figure 1 have been removed. The parts shown illustrate the main scope of the present invention and will be described further in relation to fig. 3 - 7. The parts are a motor housing 10, a dust container 11, a shock absorbing sealing 12, two filter means 13 - 14 and filter sealing means 15 - 16.

[0015] In fig. 3 the dust container 11 is shown in a perspective view. The container is in the illustrative embodiment a separate part attached to the cleaner body. The container mounted in the cleaner body rests in an underbody 17 shown in fig. 8. This underbody will be described further in relation to fig. 8. The container could, in an alternative embodiment, be integrated together with other parts of the cleaner body. The main intention of any kind of dust container is to create a compartment for dust filtration means, such as a dustbag or a dust cyclone. In order to improve the filtration of the cleaner, and to improve the promise of health, a proper more effective dust bag could preferably be placed inside the compartment. Preferably, the bag may also contain means removing unpleasant smell often generated inside the cleaner. Using a cyclone, the cyclone system should contain features (cyclone filters etc) achieving the properties as mentioned in relation to the bag.

[0016] The dust container 11 has supporting ribs 19 strengthen the walls of the dust container. Further, the container has means 20 guiding the front lid 21 (see fig. 1) covering the dust container between an open and closed position. The same means also enable for attachment of a body handle 22 for lifting the cleaner. The container further comprises a filter opening 23 intended to catch and hold the motor filter 13 and filter sealing 15 further described in relation to fig. 4. Inside the opening, ribs 24 are shown, shaped like a star. The ribs extend towards each other and are connected in the centre of the star. The opening forms a circularly shaped dust container outlet 25 connecting the dust compartment with the motor housing 10. The ribs form a grid allowing air to pass out through said outlet 25. A groove 26 formed around the opening 23 intends to receive the filter sealing 15. The design of the opening, the outlet and the distance between the grid and the fan motor (not shown) is optimised in order to achieve very low airflow power losses.

[0017] In fig. 4 an embodiment of a motor filter 15 is shown. The filter has a filter medium 27 folded to create a large filter area. The advantage with a large filter area is an improved filtration. The thicker the filter a larger area is created. A frame 28 forms the outer dimensions of the

filter, strengthens the filter, and enables it to be supported at the dust container filter opening 23. Ribs 29 in said frame protect the filter medium from mechanical damage, for instance caused by the expansion of the dust bag or heat. The filter medium is preferably HEPA 12. Down below the advantages of the present invention in relation to HEPA will be further discussed. The filter is changeable and preferably non washable.

[0018] A filter indication showing when the filter needs to be changed is preferably achieved using two pressure sensors. One sensor, positioned on the circuit board is preferably connected to the dust compartment through a pipe and a hole placed near the opening 23. This sensor measures the pressure level in the dust compartment, before the air has passed the filter. The other sensor, also positioned on the board, is preferably connected through a hole facing the area closest to the grid 24. This filter measures the pressure level at the dust container outlet, after the air has passed through the filter. The cleaner then calculates the pressure difference between the two sides of the filter. A large pressure difference means that the filter is clogged with dust and needs to be changed. A diode indicates the clogged filter.

[0019] When the motor filter 13 is mounted in the filter opening 23 it will, because of its thickness, extend inwards towards the dust container outlet 25. Holding means, not shown, will hold the filter into position. The filter sealing 15 will create an effective sealing between the filter frame 28 and the dust container. The result is that substantially no air will leak out to the outlet without passing through the filter medium 27. The frame 28 is also designed with extending parts 30 to receive the filter sealing 15 so that the filter 13 will not be able, by heat and the strong force of the airflow, to move towards the outlet 25. The extending parts and the sealing will, influenced by the force of the strong airflow, even more improve the sealing effect. The airflow will flow out from the dust compartment through the container outlet 25. Moreover, since the filter medium 27 will rest on the ribs 24, the strong airflow will not be able to damage the folded medium.

[0020] In fig. 5 the motor housing 10 is shown and a cord winder compartment 31 can be seen positioned therein. The motor housing should rest in the rear part of the underbody 17 shown in fig. 8. Screws help fixing the motor housing to the underbody. The housing could, in an alternative embodiment, similar to the dust container 11, be integrated together with other parts of the cleaner body. The motor housing further comprise a motor house inlet opening 32 through which the airflow flows into the housing. The airflow is generated by the fan motor (not shown) that should be placed inside the motor housing. The airflow flows out of the motor housing through a motor housing outlet 33. Ribs around the housing make its walls strong enough to withstand the high pressure and heat during operation. Moreover, ribs used instead of thicker walls, bring down the weight of the motor housing. Screw holes 34 are used to fit the housing sealed to

the dust container. The motor housing walls ends 35 will cooperate with the dust container 11 and the shock absorbing sealing 12 as described below. The dimensions of the outlet opening correspond to the dimensions of the exhaust filter 14 and the filter sealing 16, which will be described below.

[0021] In fig. 2 the shock absorbing sealing 12 is shown. One of its tasks, except for receiving the fan motor vibrations, is to create an airtight sealing between the dust container 11 and the motor housing 10 so that all the air volume flowing out from the dust container outlet 25 will reach the motor housing opening 32. The dust container and the motor housing are fixed in relation to each other using screws, in which the wall ends 35 and corresponding parts on the dust container will be forced against each other, and partly compress the sealing 12. The compression will create an airtight sealing. In order to improve the sealing, an extending ring (not shown) could preferably be formed on the side of the sealing 12 which faces the housing opening 32. The ring will extend towards the opening 32 along the motor housing wall ends 35. Since there is an overpressure at the opening, the flexible ring will be forced outwards so that it will rest on the inner sidewalls 36 of the housing 10. The connection between the ring and the motor housing will further improve the sealing effect.

[0022] Moving over to fig. 6 and 7 an illustrative embodiment of the exhaust filter will be further described. In fig. 7 the filter frame 38 is shown. The frame intends to support the filter medium 37 exposed to high flow pressure and heat. Supporting ribs 39 further enables this. In order to further improve the support, towers 44 (see fig. 8) will preferably, when the motor housing is mounted in the underbody 17, support the ribs.

[0023] The frame 38, similar to the motor filter frame 28, has extending parts 40 to receive the filter sealing 16 so that the frame will not be able, by heat and the strong force of the airflow, to move out through the housing outlet 33. The filter sealing 16 will create an effective sealing between the filter frame 38 and the motor housing. The result is that substantially no air will leak out from the housing without passing through the filter medium 37. The extending parts and the sealing will, influenced by the force of the strong airflow, even more improve the sealing effect. The airflow will thereby substantially flow out from the motor housing 10 through the housing outlet 33.

[0024] The frame 38 also comprises hooks 41. These will make sure that the exhaust filter will not loosen from the motor housing. The hooks cooperate with the housing outlet 33 so that the hooks will hook on the outlet edges 42 of said outlet. In fig. 2 it can be seen how the exhaust filter rests at the housing outlet inside the motor housing 10.

[0025] The exhaust filter medium 39 is preferably HEPA 12. In order to reduce the power losses and increase the life cycle of said filter, the area of filtration is higher than the area of filtration of the motor filter medium

27. A larger filter area means that the filter can receive more dust before getting too clogged. The filter medium is folded to create a large filter area and if the medium thickness for instance is increased with 3mm, the area can be increased with 20%. Since the exhaust is intended to work as a permanent filter the increased filter area is a very important feature.

[0026] Fig. 8 shows an exploded view with some part of the vacuum cleaner body. Comparing with fig. 1 and 2 the underbody 17 together with outlet diffusers 43 are shown in fig. 1 and 8. The diffusers are in fig. 1 covered with fabric resulting in that the holes of the diffusers are not visible. The airflow passing out through the exhaust filter vertically downwards will pass out from the body through the diffuser holes. The fabric will create an esthetical design. In fig. 8 the motor housing 10 is also shown. The housing, together with the dust container 11 (see fig. 2) is arranged resting in the underbody. As described earlier, the housing and the container are attached to each other, sealed by the shock absorbing sealing 12. The motor filter 13 and the exhaust filter 14 are attached as shown in fig. 2. The fabric should be very strong and of proper quality so that no fibres are spread from it nor any dust or smell is received by the fabric.

[0027] The intention of the features of the vacuum cleaner described above is to improve the filtration of the cleaner. Instead of the prior use of one operating HEPA filter, two filters are used. Together they will achieve a much higher degree of filtration. Moreover, in order to achieve a higher level of filtration, the features must be designed to enable a higher level of air sealing. The shock absorbing sealing 12 together with the motor filter sealing 15 and the exhaust filter 16 will make sure that substantially all the air passing through said body will pass through the two filters 13 and 14. Thereby, the effectiveness of filtration substantially will only depend on the filters and the filtration level can be improved.

[0028] Since the exhaust filter 14 is a permanent filter which should last the total lifetime of the cleaner, it is very important that the cleaner also comprises a changeable filter positioned so that it filtrates all the air later reaching the exhaust filter 14. This motor filter 13 should also have a high degree of filtration. Using a HEPA 12 filter as motor filter will guarantee that the exhaust filter substantially only is exposed to coal dust from the motor. Since the amount of coal is very low, the exhaust filter will last long enough. The motor filter 13 can then be changed based on the filter clogging indication mentioned earlier.

[0029] The system will correspondingly, using HEPA 12 filter medium at both filters, achieve a HEPA 13 degree of filtration for the vacuum cleaner as a whole. HEPA 13 means a 99,95% filtration at MPPS (Most Penetrating Particle Size) on all levels. The sealing contributes to enable this. The use of proper fabric at the outlet diffusers will further guarantee HEPA 13 as complete cleaner system. No vacuum cleaner today has HEPA 13, meaning that the cleaner described above will be in world class when it comes to dust emissions. Present cleaners use

one HEPA 12 placed as a changeable exhaust filter to achieve a high degree of filtration. Using a dust bag with good properties will also contribute to enable HEPA 13.

[0030] The main scope of the invention is to create a complete HEPA 13 vacuum cleaner system using more than one HEPA 12 filter and a better sealing. It should however be understood by the person skilled in the art that other embodiments, using a combination of filters and/or an improved sealing for enabling a complete HEPA 13 system also falls within the scope of the invention. The features of the invention should provide a better level of filtration and lower dust emissions and thereby gives a better promise to the consumers of the Health segment. Moreover, the present invention is user-friendly, meaning that the handle of filter is easy for the user and that the system enables an avoidance of clogged filter lowering the efficiency of the vacuum cleaner.

[0031] It will be appreciated by those ordinary people skilled in the art that the present invention can be embodied in other specific forms. The present disclosed embodiment is therefore considered in all respect to be illustrative and not restrictive. The appended claims rather than the foregoing description indicate the scope of the invention, and all changes that come within the meaning and range of equivalents thereof are intended to be embraced therein.

Claims

1. Vacuum cleaner comprising at least one dust collector and at least one fan motor placed inside a motor housing (10), said collector being arranged inside a dust compartment and comprising means for collecting particles brought into said collector by an air stream generated by said fan motor, said air stream flowing into said cleaner substantially through a cleaner inlet and flowing out from said cleaner substantially through a cleaner outlet (43), whereby said stream during its flow through said cleaner is guided through a path connecting said cleaner inlet with said cleaner outlet (43), at least one first inner outlet (25) and second inner outlet (33) being arranged in said path, wherein said second inner outlet is a motor housing outlet (33), said vacuum cleaner comprises a first filter (13), removably arranged at said first inner outlet (25), and a second filter (14), arranged at said motor housing outlet (33), wherein said second filter (14) is an exhaust filter (14), **characterized in that** said exhaust filter comprises a frame (38) having extending parts (40) to receive a filter sealing (16), so that the frame will not be able to move out through the motor housing outlet (33), the frame (38) comprises hooks (41), the hooks cooperate with the motor housing outlet (33) so that the hooks (41) hook on an outlet edge (42) of said motor housing outlet (33), and the exhaust filter (14) rests at the motor housing outlet (33) inside the motor housing (10).

2. Vacuum cleaner according to claim 1 **characterized in that** said cleaner comprises a dust container (11) forming said dust compartment inside which said dust collector is arranged. 5
3. Vacuum cleaner according to any of the preceding claims **characterized in that** said dust collector comprises a dust filter bag or a dust-separating cyclone. 10
4. Vacuum cleaner according to any of the preceding claims **characterized in that** said first inner outlet (25) is arranged forming an air connection between said dust compartment and said fan motor, substantially all the air from said dust compartment reaching said fan motor. 15
5. Vacuum cleaner according to any of the preceding claims **characterized in that** said motor housing outlet (33) is arranged forming an air connection between said fan motor and said cleaner outlet (43). 20
6. Vacuum cleaner according to any of the preceding claims **characterized in that** said exhaust filter (14) has a thickness greater than the thickness of said first filter (13). 25
7. Vacuum cleaner according to any of the preceding claims **characterized in that** said exhaust filter (14) has a filtration class substantially corresponding to the filtration class of said first filter (13). 30
8. Vacuum cleaner according to any of the preceding claims **characterized in that** both said filters (13,14) comprise a frame (28,38) supporting an air permeable filter medium (27, 37) defining the filtration properties of said filter (13,14). 35
9. Vacuum cleaner according to claim 8 **characterized in that** at least one of said filter mediums (27,37) has the properties of filtration class HEPA 12. 40
10. Vacuum cleaner according to any of the preceding claims **characterized in that** said cleaner comprises means detecting the properties of at least one of said filters. 45

Patentansprüche

1. Staubsauger, der wenigstens einen Staubsammler und wenigstens einen in einem Motorgehäuse (10) platzierten Gebläsemotor umfasst, wobei der Sammler innerhalb eines Staubsammelraums angeordnet ist und Vorrichtungen zum Sammeln von Partikeln, die durch einen vom Gebläsemotor generierten Luftstrom in den Sammler eingebracht werden, umfasst, wobei der Luftstrom im Wesentlichen durch

einen Staubsaugereinlass in den Staubsauger einströmt und im Wesentlichen durch einen Staubsaugerauslass (43) aus dem Staubsauger ausströmt, wobei der Luftstrom während seiner Strömung durch den Staubsauger über einen Pfad geleitet wird, der den Staubsaugereinlass mit dem Staubsaugerauslass (43) verbindet, und wenigstens ein erster Innenauslass (25) und zweiter Innenauslass (33) in diesem Pfad angeordnet sind, wobei der zweite Innenauslass ein Motorgehäuseauslass (33) ist, der Staubsauger einen ersten Filter (13), der abnehmbar am ersten Innenauslass (25) angeordnet ist, und einen zweiten Filter (14), der am Motorgehäuseauslass (33) angeordnet ist, umfasst, wobei der zweite Filter (14) ein Abluftfilter (14) ist, **dadurch gekennzeichnet, dass** der Abluftfilter einen Rahmen (38) mit sich erstreckenden Teilen (40) zum Aufnehmen einer Filterdichtung (16) umfasst, so dass der Rahmen sich nicht durch den Motorgehäuseauslass (33) bewegen kann, wobei der Rahmen (38) Haken (41) umfasst, die mit dem Motorgehäuseauslass (33) so zusammenwirken, dass die Haken (41) sich an einer Auslasskante (42) des Motorgehäuseauslasses (33) einhaken und der Abluftfilter (14) am Motorgehäuseauslass (33) innerhalb des Motorgehäuses (10) anliegt.

2. Staubsauger nach dem Anspruch 1, **dadurch gekennzeichnet, dass** der Staubsauger einen Staubbehälter (11) umfasst, der den Staubsammelraum bildet, innerhalb dessen der Staubsammler angeordnet ist.
3. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Staubsammler einen Staubfilterbeutel oder einen staubabscheidenden Zyklon umfasst.
4. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der erste Innenauslass (25) derart angeordnet ist, dass er eine Luftverbindung zwischen dem Staubsammelraum und dem Gebläsemotor bildet, so dass im Wesentlichen die gesamte Luft aus dem Staubsammelraum den Gebläsemotor erreicht.
5. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Motorgehäuseauslass (33) derart angeordnet ist, dass er eine Luftverbindung zwischen dem Gebläsemotor und dem Staubsaugerauslass (43) bildet.
6. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Abluftfilter (14) eine Dicke aufweist, die größer als die Dicke des ersten Filters (13) ist.

7. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Abluftfilter (14) eine Filterklasse aufweist, die im Wesentlichen der Filterklasse des ersten Filters (13) entspricht.

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8. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** beide Filter (13, 14) einen Rahmen (28, 38) zum Stützen eines luftdurchlässigen Filtermediums (27, 37), das die Filtereigenschaften der Filter (13, 14) definiert, umfassen.

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9. Staubsauger nach dem Anspruch 8, **dadurch gekennzeichnet, dass** wenigstens eines der Filtermedien (27, 37) die der Filterklasse HEPA 12 entsprechenden Eigenschaften aufweist.

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10. Staubsauger nach einem beliebigen der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Staubsauger Vorrichtungen zum Ermitteln der Eigenschaften von wenigstens einem der Filter umfasst.

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Revendications

1. Aspirateur comprenant au moins un dispositif de collecte de poussière et au moins un moteur de ventilation placé à l'intérieur d'un logement de moteur (10), ledit dispositif de collecte étant disposé à l'intérieur d'un compartiment à poussière et comprenant des moyens servant à collecter des particules amenées dans ledit dispositif de collecte par un flux d'air généré par ledit moteur de ventilation, ledit flux d'air entrant dans ledit aspirateur essentiellement par une entrée d'aspirateur et sortant dudit aspirateur essentiellement par une sortie d'aspirateur (43), ledit flux étant guidé, lors de son écoulement à travers ledit aspirateur, le long d'un trajet reliant ladite entrée d'aspirateur à ladite sortie d'aspirateur (43), au moins une première sortie intérieure (25) et une seconde sortie intérieure (33) étant prévues dans ledit trajet, ladite seconde sortie intérieure étant une sortie de logement de moteur (33), ledit aspirateur comprenant un premier filtre (13), disposé, de manière amovible, au niveau de ladite première sortie intérieure (25), et un second filtre (14), disposé au niveau de ladite sortie de logement de moteur (33), ledit second filtre (14) étant un filtre d'évacuation (14), **caractérisé en ce que** ledit filtre d'évacuation comprend un cadre (38) comportant des parties saillantes (40) destinées à recevoir un élément d'étanchéité de filtre (16), de telle sorte que le cadre ne puisse pas sortir par la sortie de logement de moteur (33), le cadre (38) comprend des crochets (41), les crochets coopèrent avec la sortie de logement de moteur (33) de telle sorte que les crochets

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(41) s'accrochent sur un bord extérieur (42) de ladite sortie de logement de moteur (33), et le filtre d'évacuation (14) est en appui au niveau de la sortie de logement de moteur (33) à l'intérieur du logement de moteur (10).

2. Aspirateur selon la revendication 1, **caractérisé en ce que** ledit aspirateur comprend un réceptacle à poussière (11) formant ledit compartiment à poussière, à l'intérieur duquel est disposé ledit dispositif de collecte de poussière.

3. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit dispositif de collecte de poussière comprend un sac-filtre à poussière ou un cyclone de séparation de poussière.

4. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ladite première sortie intérieure (25) est disposée de façon à établir une communication d'air entre ledit compartiment à poussière et ledit moteur de ventilation, essentiellement l'intégralité de l'air provenant dudit compartiment à poussière parvenant audit moteur de ventilation.

5. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ladite sortie de logement de moteur (33) est disposée de façon à établir une communication d'air entre ledit moteur de ventilation et ladite sortie d'aspirateur (43).

6. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit filtre d'évacuation (14) présente une épaisseur supérieure à l'épaisseur dudit premier filtre (13).

7. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit filtre d'évacuation (14) présente une classe de filtration correspondant essentiellement à la classe de filtration dudit premier filtre (13).

8. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdits filtres (13, 14) comprennent tous deux un cadre (28, 38) supportant un moyen formant filtre (27, 37) perméable à l'air définissant les propriétés de filtration dudit filtre (13, 14).

9. Aspirateur selon la revendication 8, **caractérisé en ce qu'**au moins un desdits moyens formant filtres (27, 37) présente les propriétés de la classe de filtration HEPA12.

10. Aspirateur selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit as-

pirateur comprend des moyens de détection des propriétés d'au moins un desdits filtres.

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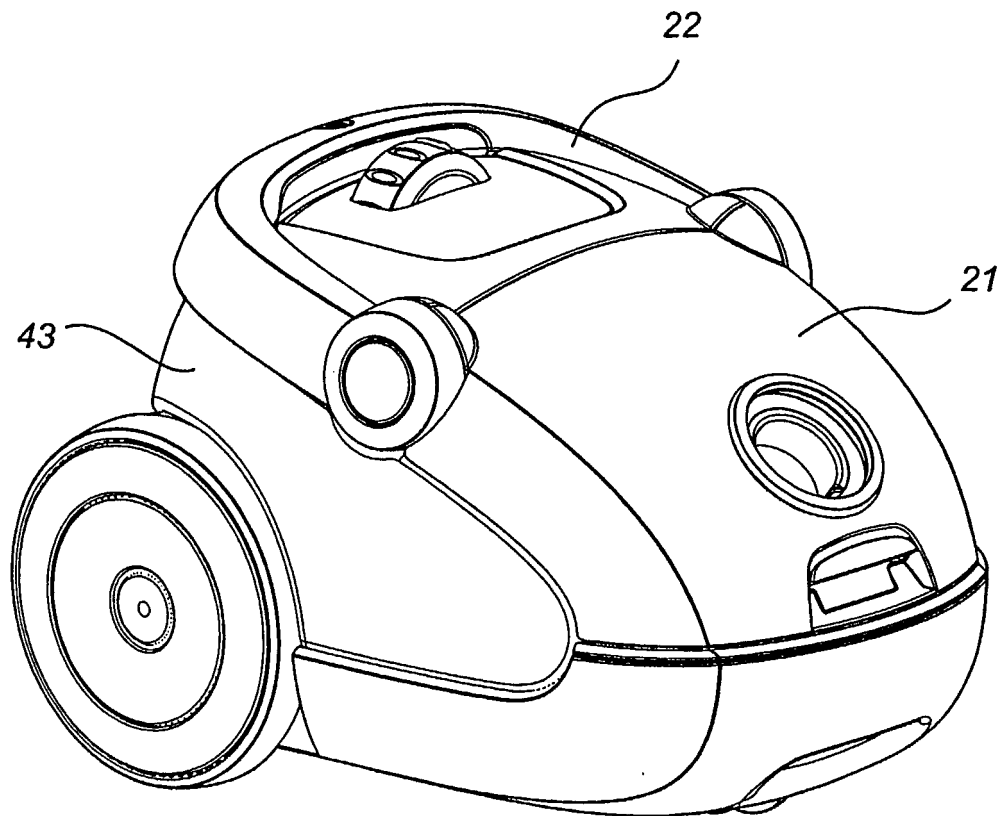


Fig. 1

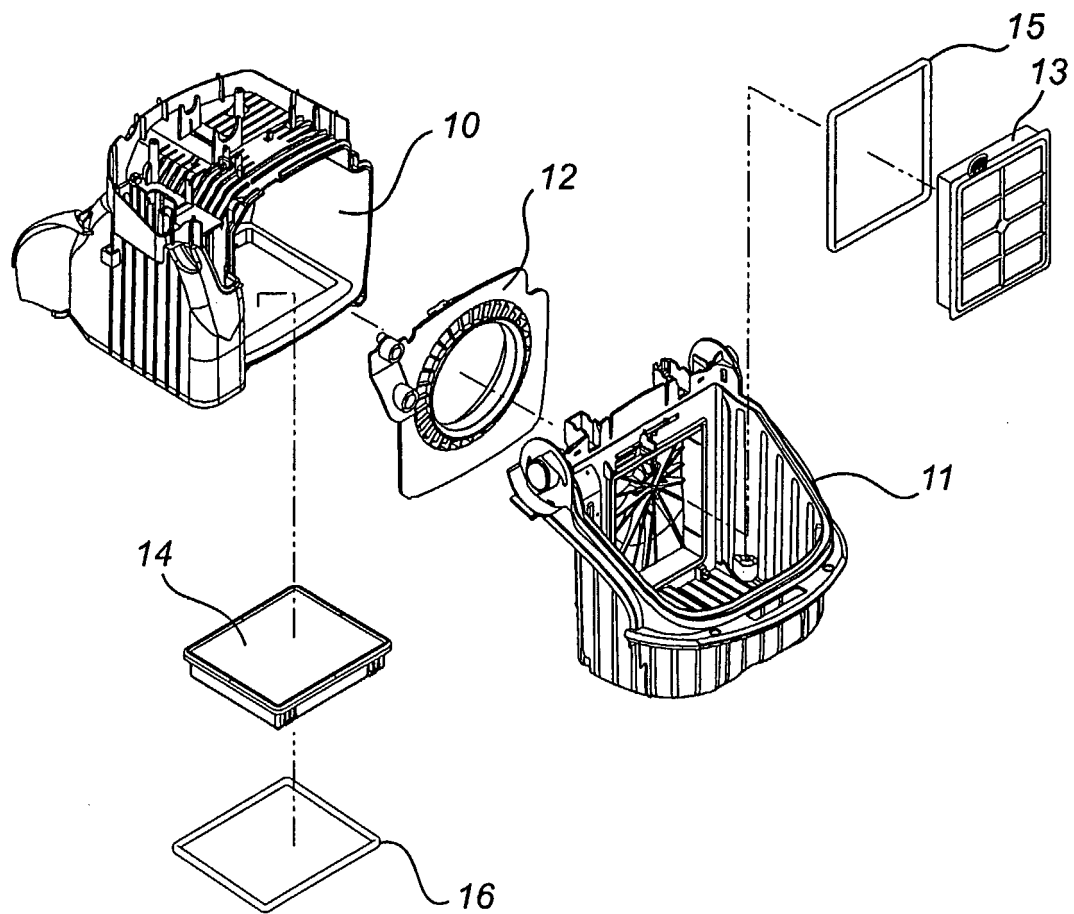
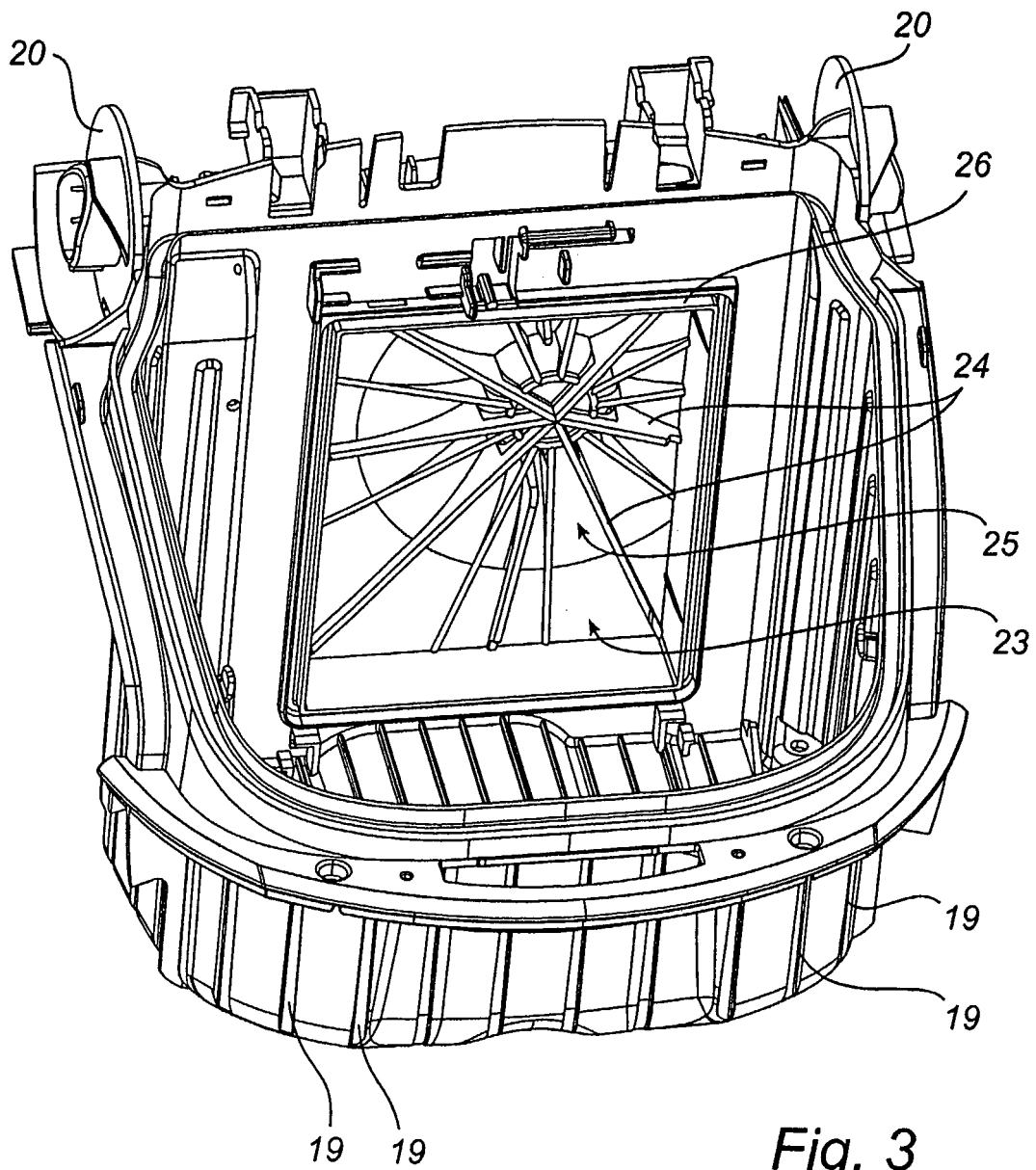


Fig. 2



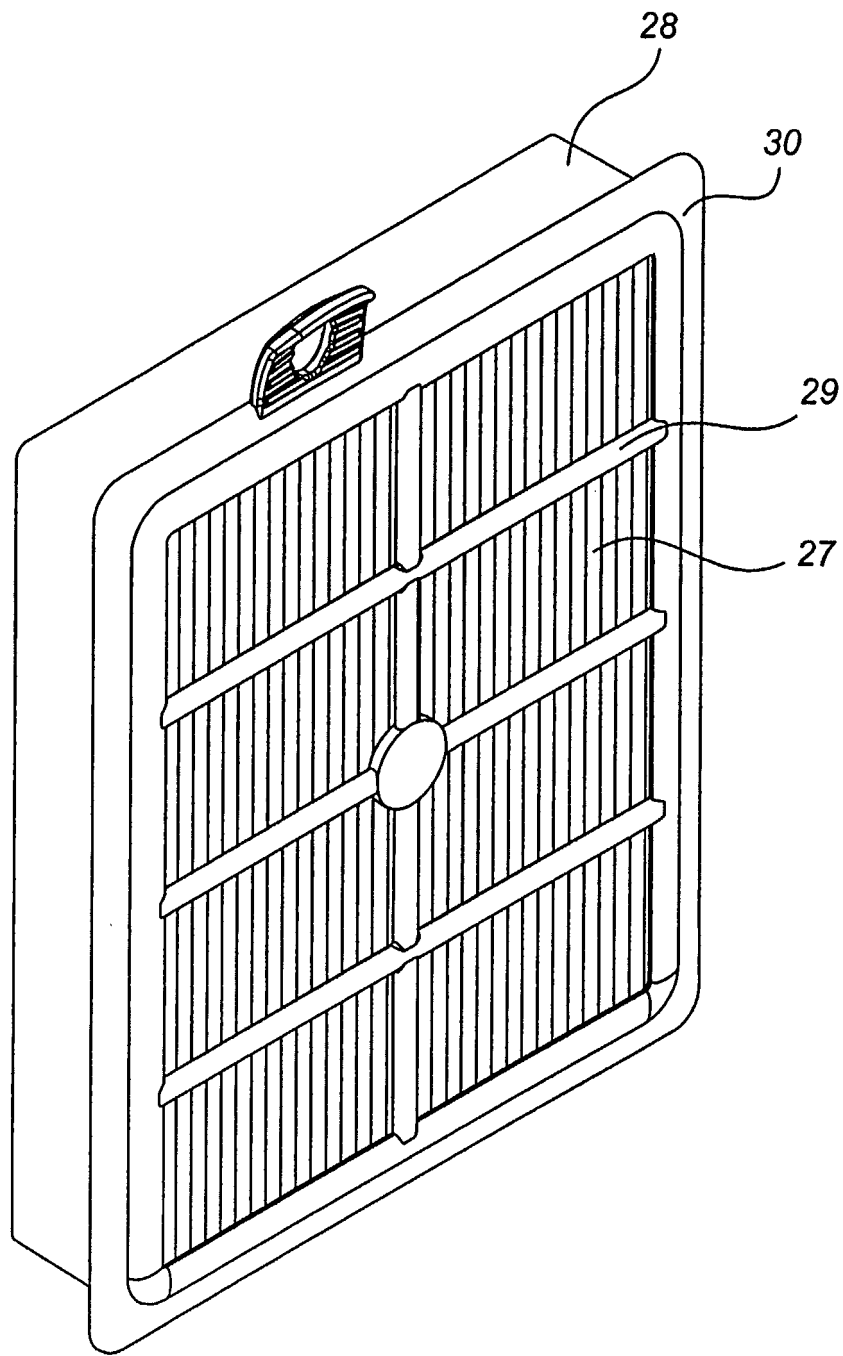
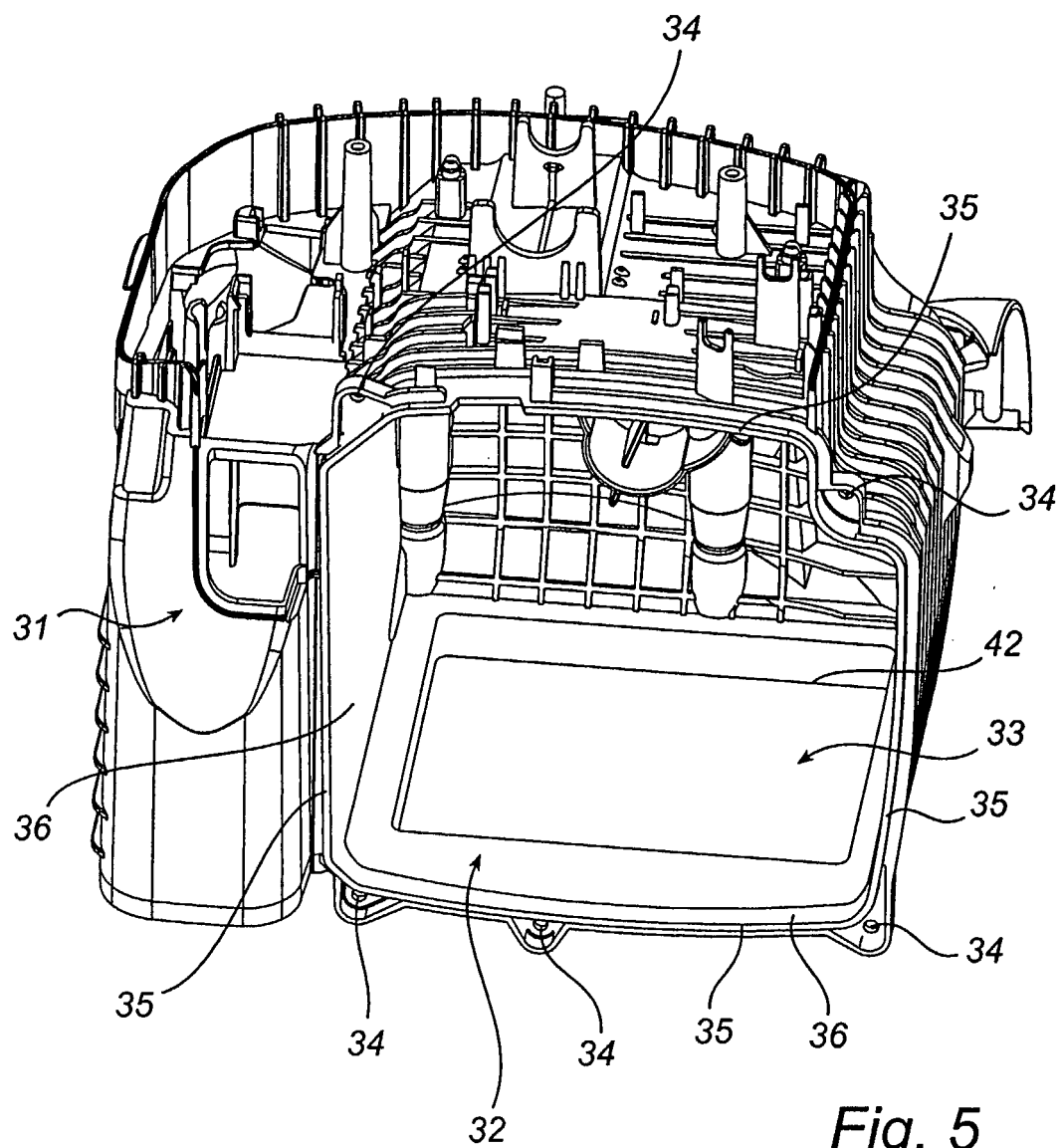
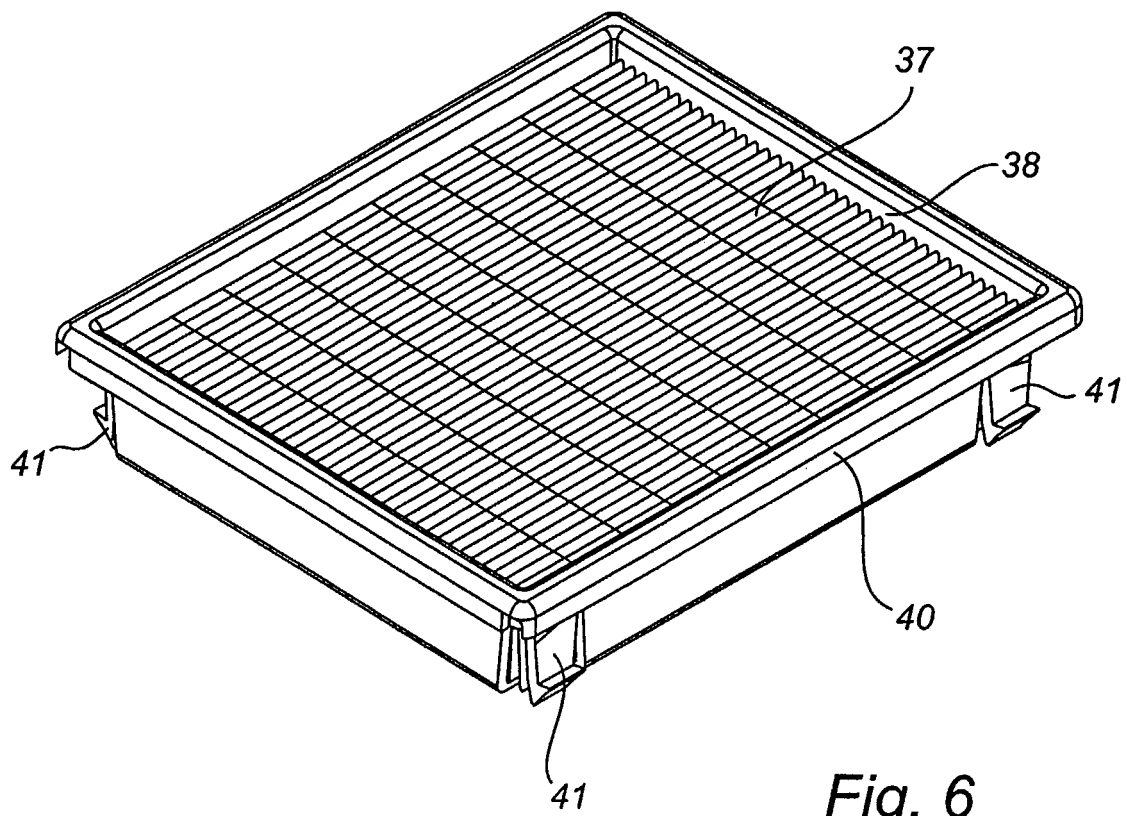


Fig. 4





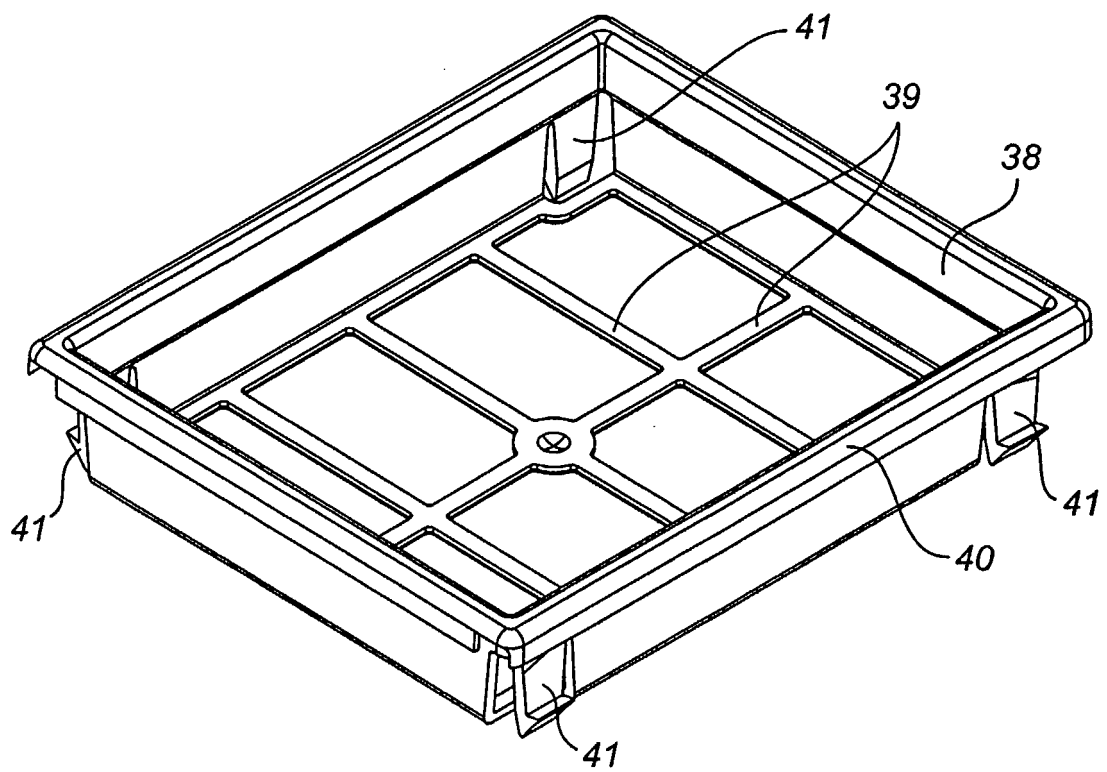


Fig. 7

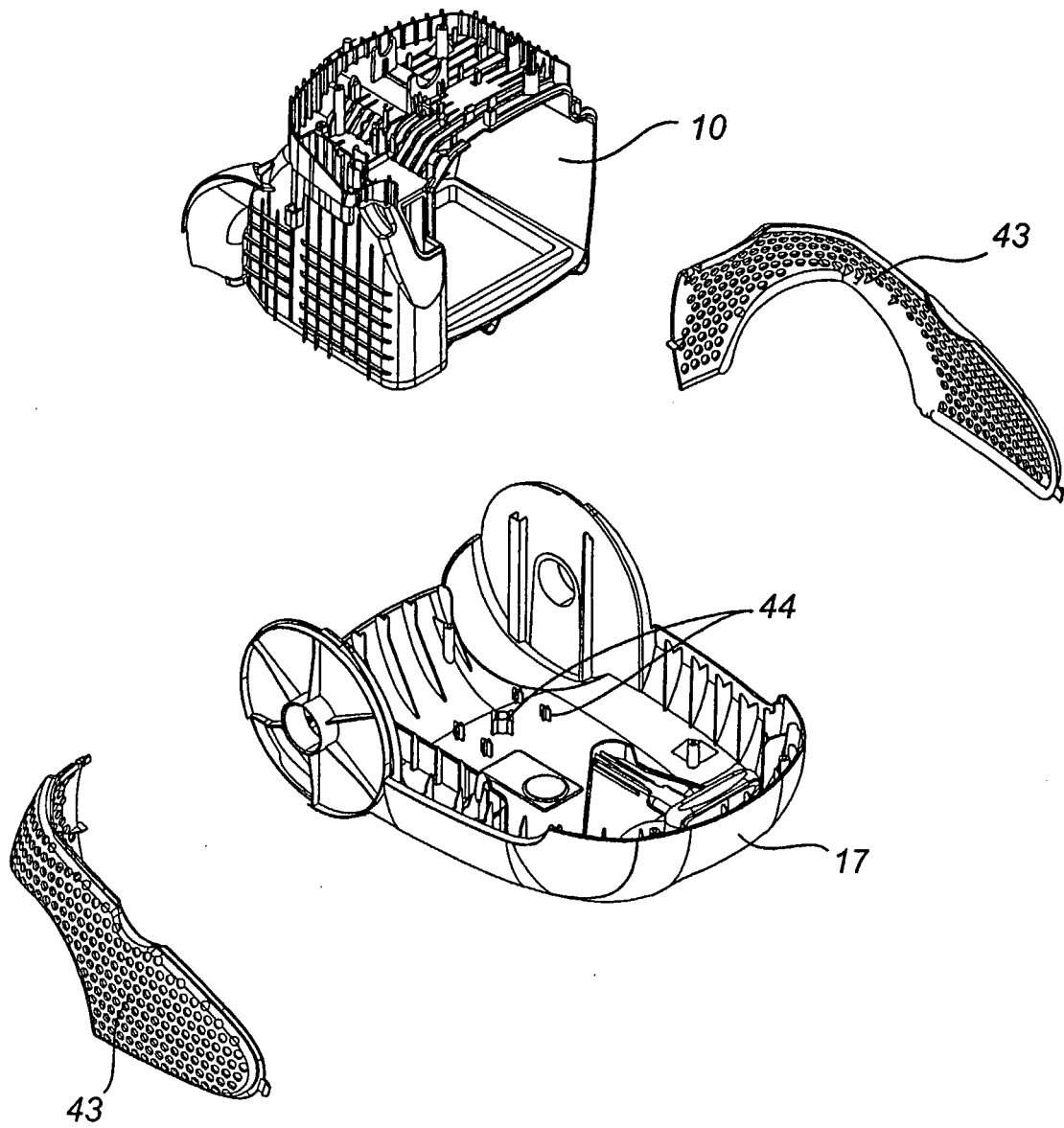


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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