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(54) **VACUUM CLEANER WITH DUST BAG CLOSING/SEALING ARRANGEMENT**

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(56) References cited:
WO-A1-98/10691

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EP 1 339 306 B1

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Description

[0001] This invention relates to a vacuum cleaner comprising a vacuum cleaner housing with a vacuum source, an inlet for dust-laden air communicating with the vacuum source, and a separation system for particles separated from the airflow that is placed after the inlet as seen in the airflow direction. The separated particles are generally collected in a bag of a mainly airtight material.

[0002] In conventional vacuum cleaners, dust-laden air is transported by a vacuum source from a nozzle to a dust container in the form of an air permeable bag. The air is filtrated so that the dust is retained in the bag, while the cleaned air flows through the bag material towards the vacuum source. Usually this bag is disposable and is often provided with a closing arrangement that is manually activated when the bag is removed from the vacuum cleaner. Such an arrangement gives a rather hygienic handling of the bag and its content, but the arrangement still has some disadvantages. Because of leakage and unsatisfactory filter capacity, a leakage of the airflow normally occurs to the outside of the bag causing dust particles to be deposited on the outside. A further disadvantage is that the bags are usually specially made for different vacuum cleaner models and are sold in special stores making it difficult for the customers to find the bags on the market.

[0003] During recent years, so-called cyclone vacuum cleaners have appeared on the market. They are designed such that the dust particles are separated from the airflow by means of centrifugal separation. The dust particles are collected in a rigid container which, when emptied, is removed from the vacuum cleaner and transported to a dustbin. This is cumbersome as well as dirty work, since a large amount of the dust sticks to the wall of the container and has to be removed by manual effort. The container also surrounds vital parts of the cyclone arrangement and manual efforts are necessary in order to remove the interior parts of the container before cleaning the container. This manual work causes dust to spread to the surroundings when the container is emptied. Thus, the arrangement is very unhygienic.

[0004] In order to create a better solution for cyclone vacuum cleaners, the use of disposable bags in the form of airtight bags has been suggested, see U. S. Patent Nos. 5,145,499 and 5,090,976. The dust is enclosed in the bag, after which the complete bag with its content is thrown into the dustbin. However, these bags are specially made and the handling will not be much better with these bags since parts of the cyclone arrangement, which are placed within the container and which press the bag towards the container wall to prevent the bag from being sucked into the cyclone, still have to be removed manually before the container can be emptied.

[0005] A further development of the last-mentioned special bags is described in W.O. No. 9,810,691. This bag has an upper portion that can be twisted in order to close the bag before the bag is removed from the vacuum

cleaner. The bag is complicated and hence expensive.

[0006] Emptying systems for cyclone vacuum cleaners have also been suggested, see PCT/SE98/00240. In these systems, conventional plastic bags are used which are retained at the container wall by an under-atmospheric pressure created on the outside of the bag by the vacuum source. The portions of the cyclone arrangement, which are positioned at the upper part of the container, are easier to remove. The outside of the bag, as well as the inside of the container, also remains clean producing better hygienic conditions during handling. However, this system is still not completely hygienic, since the operator is forced to remove the bag from the surrounding container by manual means before it can be closed, for instance, by being tied.

[0007] WO 98/10691 discloses a vacuum cleaner including a disposable base. The base includes a lower, rigid portion and an upper portion comprising a flexible sleeve, i.e. a flexible wall portion. The base is sealable by twisting the base such that a part of the upper, flexible portion forms a tight neck.

[0008] This invention provides for a closing and/or a sealing effect of a dust bag by a closing and/or sealing means built into the vacuum cleaner. This enables a hygienic removal procedure for the bag as well as hygienic handling of the bag. Thus, the bag can be removed, transported, and thrown into a dustbin without any spillage of dust.

[0009] According to the invention, the arrangement is preferably because there is no need to touch the bag before the bag is closed and/or sealed and subsequently removed from the container where the bag is placed in the vacuum cleaner. This is achieved by means of a vacuum cleaner having a housing with a vacuum source, an inlet for dust-laden air communicating with the vacuum source, a separation system for particles separated from the air flow that is placed after the inlet as seen in the airflow direction, wherein the separated particles are collected in a bag of a mainly airtight material, and a closing and/or sealing arrangement by which the bag inserted into the vacuum cleaner is closed and/or sealed before the bag is removed from the vacuum cleaner,

[0010] An embodiment of the invention will now be described with reference to the accompanying figures in which:

FIG. 1 is a schematic of a vertical section through a cyclone vacuum cleaner having a combined closing and sealing means according to an embodiment of the invention;

FIG. 2 is a vertical section through a part of a vacuum cleaner equipped with a first embodiment of a combined closing and sealing means;

FIG. 3 is a perspective view of the closing and sealing means shown in FIG. 2;

FIG. 4 is an elevation view of the device shown in FIGS. 2 and 3;

FIG. 5 is a perspective view of a second embodiment

of a sealing device;

FIG. 6 is an elevation view of a third embodiment of a sealing device;

FIG. 7 is a vertical section through a fourth embodiment of a sealing device;

FIG. 8 is elevation view of a section on the line VIII-VIII in FIG. 7; and

FIGS. 9 and 10 are the same views as FIG. 8, but with the mechanical parts in other positions.

[0011] The vacuum cleaner shown in Fig. 1 comprises a housing 10 enclosing a vacuum source 11, such as a motor-fan unit, and a separation part shaped as a cyclone separator 12 having an inlet 13 for dust-laden air. The inlet 13 is connected via a tube 14 to a nozzle (not shown). The cyclone separator 12 comprises a mainly cylindrical chamber 15 having a first and a second end wall 16 and 17, respectively. The inlet 13 is arranged near the first end wall 16 and designed such that a tangential inflow of the dust-laden air is achieved. Centrally in the chamber 15 and close to the first end wall 16, there is a tube-shaped outlet 18 for cleaned air. This outlet 18 extends somewhat into the chamber 15 and is connected to the inlet side of the motor-fan unit 11. The chamber 15 also has a peripheral particle outlet 19 for particles separated by the cyclone separator 12 and is placed close to the second end wall 17.

[0012] The particle outlet 19 ends in a removable, stiff collecting container 20 in which a dust container, in the form of a bag 21, is inserted. The bag 21 is pulled through an opening 22 in a cover part 23 belonging to the collecting container 20 such that the particles passing the particle outlet 19 are collected in the bag. The bag 21 preferably consists of an airtight material, such as plastic. The container cover 23, which also comprises a cover plate 24 (not shown in detail), encloses a closing and sealing arrangement for the bag 21 such that the bag can first be closed and then be sealed before it is removed from the vacuum cleaner.

[0013] The vacuum cleaner includes two L-shaped clamping jaws 25, as shown in Figs. 2-4. Each L-shaped clamping jaw 25 is turnably arranged about a shaft 26, which is arranged beside the cover opening 22 of the container cover part 23. Each clamping jaw 25 has a first leg 27 with a part extending outside the cover that can be acted on manually or by some type of automatic system for turning the clamping jaws 25 between the positions shown with the full lines and the dashed lines in Fig. 4. Between the legs 27 of the clamping jaws 25, there is a tension spring 28, which is placed such that when the clamping jaws are open and in their inactive position (Fig. 3), the tension spring 28 is positioned at one side of a connecting line between the shafts 26. When the clamping jaws 25 are in their active, closed position (Fig. 4), the tension spring 28 is positioned at the other side of said connecting line. Thus, the clamping jaws 25 automatically take one of these positions. The second legs 29 of the clamping jaws 25 are provided with a heating

thread 30 on their sides facing towards one another. The heating thread 30 extends between the two clamping jaws and at each side of them. The heating thread is connected to an electric supply circuit 31 comprising one or several batteries 32 (Fig. 2) or means for electric supply via the mains supply (not shown). There may also be electrical control means, such as switches, timers and so on, for controlling the sealing and/or closing arrangement.

[0014] The device according to Figs. 1-4 operates in the following way. When the motor-fan unit 11 is activated, dust-laden air will flow through the inlet 13 and circulate in the chamber 15. The dust particles will be influenced by the centrifugal forces and be transported towards the second end wall 17 of the chamber 15 and towards the particle outlet 19, where the particles are thrown out through the cover opening 22 and into the bag 21 inserted through the cover opening 22. At the same time, cleaned air flows through the clear air outlet 18 and is transferred to atmosphere by means of the motor-fan unit 11. In this position, the clamping jaws 25 take the position shown in Fig. 3.

[0015] When the bag 21, which in this case is a plastic bag, has been filled and the operator wishes to change the bag, the collecting container 20 is removed together with the bag 21 and the container cover 23, after which the clamping jaws 25 are moved to take the position shown in Fig. 4. Then, a switch 33 is engaged so that the control circuit 31 supplies a suitable current flow from the battery 32, or some other current source, and the heating thread 30 heats to such a temperature that a welding seal is achieved at the plastic bag. Then, the clamping jaws 25 are moved back to the position shown in Fig. 3, after which the container cover 23 is removed from the collecting container 20 such that the bag is lifted up from the collecting container 20, removed from the container cover 23, and transported to a dustbin without spillage. A new bag is then inserted through the cover opening 22 and together with the container cover 23 is placed in the collecting container 20. Of course, the closing and/or the sealing process can be partly or completely automated, for instance, by being connected to the removal of the collecting container 20 from the vacuum cleaner.

[0016] With the embodiment described above, it is also possible to desist from the sealing arrangement in question. After closing the bag by means of the clamping jaws 25, the bag can be sealed by manual methods, for instance, by tying up the extending part of the bag with clips, strings, or tape around the bag, or by using existing closing means on the bag for instance, so-called zippers or the like. Such an embodiment is described in Figs. 7-10.

[0017] The sealing arrangement according to the embodiment shown in Fig. 5 has a container cover 23 that encloses a circular bottom plate 40 provided with a fixed clamping jaw 41 having several small openings or recesses 42 on one side of the cover opening 22. At the

other side of the cover opening 22, there is a movable clamping jaw 43, which by two arms 44 is turnably supported at two brackets 45 arranged on the bottom plate 40. The movable clamping jaw 43 is provided with several projections 46, which are placed such that they will enter into the small recesses 42 when the movable clamping jaw 43 is turned to abut the fixed clamping jaw 41.

[0018] The last-mentioned device operates in the following way when the bag 21, which preferably is a plastic bag, is changed. The collecting container 20 with the bag 21 is removed from the vacuum cleaner, after which the movable clamping jaw 43 is turned from the position shown in Fig. 5 to a position where it rests on the fixed clamping jaw 41 and an area around the bag opening is clamped between the two clamping jaws 41, 43. Further pressing forces of the movable clamping jaw 43 causes the projections 46 to stretch, penetrate, and/or deform the bag material when they enter into the recesses 42 such that the bag will be closed. The upper part of the bag with the seal is then pulled out through the cover opening 22 and transported to a dustbin, after which a new bag is inserted through the cover opening 22 and together with the container cover 23 is placed in the collecting container 20.

[0019] In the sealing arrangement shown in Fig. 6, which can be used for all types of bags, the container cover 23 is provided with a rectangular bottom plate 50 having guides 51 on which a cassette 52 is slidably arranged. The cassette 52 comprises a tape on a first roller 53 rotatably arranged on a first holder 54. The tape is pulled out above a notched wheel 55 with the gluing surface facing outwards from the wheel. The notched wheel 55 is arranged in close vicinity of a slot-shaped opening 56 of the cassette 52, where one end of the slot-shaped opening 56 faces against the cover opening 22 in the bottom plate 50 through which the bag is partially inserted. The notched wheel 55 is placed such that its notches mainly overbridge the slot-shaped opening 56. The other end of the slot-shaped opening 56 continues into an extension 57, the purpose of which will be explained below. The cassette 52 comprises a second roller 58 having a strip-shaped non-gluing material, which is rotatably supported on a second holder 59, with the strip extending through an outlet opening 60 into the slot-shaped opening 56. The cassette 52 also encloses a L-shaped tilting arm 61 turnably supported on an arm shaft 62 and having a first arm leg 63, which via an ann tension spring 64 is connected to the housing of the cassette 52 such that the first arm leg 63 normally rests against a stop means 65. The second leg 66 of the tilting arm is placed such that it normally overbridges the slot-shaped opening 56. The first arm leg 63 is also provided with a cutting edge 67.

[0020] The device shown in Fig. 6 operates in the following manner. When the collecting container 20 with the container cover 23 has been removed from the vacuum cleaner, the cassette 52 is moved towards the left in Fig. 6 along the guides 51. The area around the bag

opening is inserted into the slot-shaped opening 56 of the cassette, so that the bag material is pressed together by the notched wheel 55 at the same time as the tape with its gluing surface abuts the bag material and at the same time the strip-shaped material is pulled out from the second roller 58 since its end is glued to the outer end of the tape. Thus, the tape and the strip-shaped material surround the bag 21 from each side. When the notched wheel has passed the bag, the tape again engages the strip-shaped material and adheres to it at the same time as the strip-shaped material and the tape are pulled out. Thus, the bag is sealed. Further movement of the cassette 52 causes the bag to engage the second leg 66 of the tilting arm 61 such that it turns anticlockwise in Fig. 6. The knife-shaped means 67 enters into the slot-shaped opening 56 and cuts the tape glued to the strip-shaped material such that there remains material glued together that is connected to the strip-shaped material on the second roller 58 as well as the tape on the first roller 53. The cassette 52 is then moved such that the bag opening, when the container cover 23 is lifted from the collecting container 20, is pulled out through the extension 57, after which the bag is removed from the collecting container 20 and the cassette 52 is moved back to its original position.

[0021] In the embodiment shown in Figs. 7-10, the vacuum cleaner has a particle outlet 19 comprising a projecting sleeve 70 extending through the cover plate 24 and the cover opening 22 of the cover part 23 into the collecting container 20. The collecting container 20 is provided with a bag 21, for instance, a conventional plastic bag. The bag opening is inserted through the cover part 23 and folded outwardly around the sleeve 70 between the cover plate 24 and the housing 10 of the vacuum cleaner such that the bag is clamped between the sleeve 70 and the surrounding periphery of the cover opening 22. The vacuum cleaner housing 10 is arranged such that the housing together with the sleeve 70 can be moved vertically in Fig. 7, with respect to the collecting container 20 and the cover part 23, when the bag is closed. The cover part 23 (in a manner not shown) is lifted up or turned up from the collecting container 20 in order to uncover the bag 21.

[0022] The cover part 23 comprises a first and a second clamping jaw 71, 72, respectively, which are connected to one another each via a first and a second notched wheel 73, 74, respectively. The wheels engage one another and synchronize a turning motion of the first and second clamping jaws towards and away from one another. Each clamping jaw 71, 72 with associated notched wheel 73, 74, are turnable around jaw shafts 75, 76. The two clamping jaws 71, 72 are via a jaw tension spring 77 connected to one another such that the line of action of the spring at different positions of the clamping jaws 71, 72 are placed at different sides of a line between the centers of the jaw shafts 75, 76. The first clamping jaws 71 also has an operating arm 78 extending outwardly from the cover part 23, which is acted on by a shoulder

79 belonging to the vacuum cleaner housing 10.

[0023] The closing device shown in Figs. 7-10 operates in the following manner. At the position shown in Figs. 7 and 8, which is the normal operating position for the vacuum cleaner, the clamping jaws 71 and 72 abut the outside of the bag 21 and press the bag towards the sleeve 70 by the jaw spring 77, and the dust particles flow through the sleeve 70 into the bag 21. When the bag 21 is changed, the housing 10 is removed. The shoulder 79 and the sleeve 70 are removed from the cover part 23 and the jaw spring 77 turns the clamping jaws 71, 72 towards one another such that the bag 21 is clamped between the jaws, see Fig. 9. The clamping jaws 71, 72 are designed such that they cover the complete cover opening 22 enabling the dust container to be separated from the surrounding in a hygienic manner. It is now possible to seal the bag opening manually, for instance, by tying with tape, clips, a string around the bag, or activating a sealing device arranged on the bag, for instance, a so-called zip-arrangement. The cover part 23 is then lifted up from the collecting container 20 and the sealed bag is removed and transported to a dustbin or the like.

[0024] The operator then acts on the operating arm 78 such that the clamping jaws 71, 72 are turned away from one another and are moved to the position shown in Fig. 10. In this position, the action line of the jaw spring 77 is placed at the other side of a connecting line between the centers of the jaw shafts 75, 76. The clamping jaws 71, 72, in this stable position, abut the periphery of the cover part 23 and the cover opening 22 becomes uncovered. A new bag is inserted from below into the opening in the cover part 23 and the associated cover plate 24, before the bag is inserted into the collecting container 20, and the cover part 23 with the cover plate 24 is applied to the container. When the housing 10 of the vacuum cleaner is then applied to the collecting container 20, the sleeve 70 again enters through the cover opening 22 at the same time as the shoulder 79 engages the operating arm 78 such that it is moved counterclockwise in Fig. 8. The action line of the jaw spring 77 thereby moves back to the first side of the connecting line between the turning centers of the jaw shafts 75, 76. Thus, the clamping jaws 71, 72 under the influence of the jaw spring 77 move toward one another and again clamp the bag against the sleeve 70.

[0025] The closing arrangement shown in Figs. 7-10 might also, in a manner mentioned in association to the embodiment according to Figs. 1-4, be completed with a sealing arrangement. It is possible with the embodiment shown in Figs. 7-10 to also desist from using a bag. An operator may instead collect the dust directly into the collecting container 20 and, in a hygienic manner, transport the closed collecting container 20 together with the cover part 23 to a dustbin. The cover part 23 may then be removed from the collecting container 20, after which the container can be emptied into the dustbin. It would also be possible to use an arrangement where the bag can be taken out from the collecting container before it

is closed and/or sealed. This may occur as long as the communication between the interior of the bag and the particle outlet of the separation system is maintained such that particles in the dust bag do not escape outside the vacuum cleaner when forces are applied on the bag.

[0026] The closing and sealing arrangement described above are primary intended to be used together with cyclone vacuum cleaners to seal airtight bags in the form of conventional plastic bags that are available on the market. However, the three last-mentioned embodiments may also be used with other bags, for example, paper bags. The expression "closing arrangement" in this connection generally means a device for temporarily closing the bag opening to prevent dust particles from leaving through the bag opening under the initial period of the bag changing procedure. The expression "sealing arrangement" generally means a device for permanently sealing of the bag opening such that the bag in a hygienic manner can be taken out of the collecting container and be moved to a dustbin or the like

Claims

1. A vacuum cleaner comprising a vacuum cleaner housing (10) with a vacuum source, an inlet (13) for dust-laden air communicating with the vacuum source, and a separation system for particles separated from an airflow that is placed after the inlet as seen in the airflow direction, wherein the separated particles are collected in at least one dust bag (21) of a mainly airtight material **characterized in that** the vacuum cleaner is provided with a closing and/or sealing arrangement by which the bag (21), inserted into the vacuum cleaner can be closed and/or sealed before the bag is removed from the vacuum cleaner, and **in that** it comprises a container (20) enclosing said bag (21), the container being provided with a cover part (23) with a cover opening (22) through which a part of the bag is inserted, wherein the closing or sealing arrangement is disposed in the cover part.
2. A vacuum cleaner according to claim 1 **characterized in that** the closing or sealing arrangement comprises clamping means (25, 41, 43, 71, 72) between which the bag (21) is clamped before it is sealed.
3. A vacuum cleaner according to claim 2 **characterized in that** the clamping means (25) is provided with electrically heated means (30) for sealing the bag.
4. A vacuum cleaner according to claim 3 **characterized in that** the vacuum cleaner further comprises a battery (32) for current supply to the electrically heated means (30).

5. A vacuum cleaner according to claim 2 **characterized in that** the clamping means (41, 43) comprises means for stretching and/or penetrating the bag material.
6. A vacuum cleaner according to claim 5 **characterized in that** said stretching and/or penetrating means comprises projecting portions (46) and corresponding recesses (42) for stretching or penetrating the bag.
7. A vacuum cleaner according to claim 1 or 2 **characterized in that** the sealing arrangement comprises a cassette (52) with a tape roller (53) and a tearing off device (67), the sealing being affected by relative motion between the cassette and an opening of the bag.

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5. Staubsauger nach Anspruch 2, **dadurch gekennzeichnet, dass** das Klemmmittel (41, 43) Mittel zum Strecken und/oder Durchdringen des Beutelmateri- als umfasst.
6. Staubsauger nach Anspruch 5, **dadurch gekennzeichnet, dass** das Streck- und/oder Durchdring-ungsmittel vorspringende Abschnitte (46) und ent- sprechende Vertiefungen (42) zum Strecken oder Durchdringen des Beutels umfasst.
7. Staubsauger nach Anspruch 1 oder 2, **dadurch ge- kennzeichnet, dass** die Versiegelungsanordnung eine Kassette (52) mit einer Bandrolle (53) und eine Abreißvorrichtung (67) umfasst, wobei die Versiege- lung durch relative Bewegung zwischen der Kasset- te und einer Öffnung des Beutels beeinflusst wird.

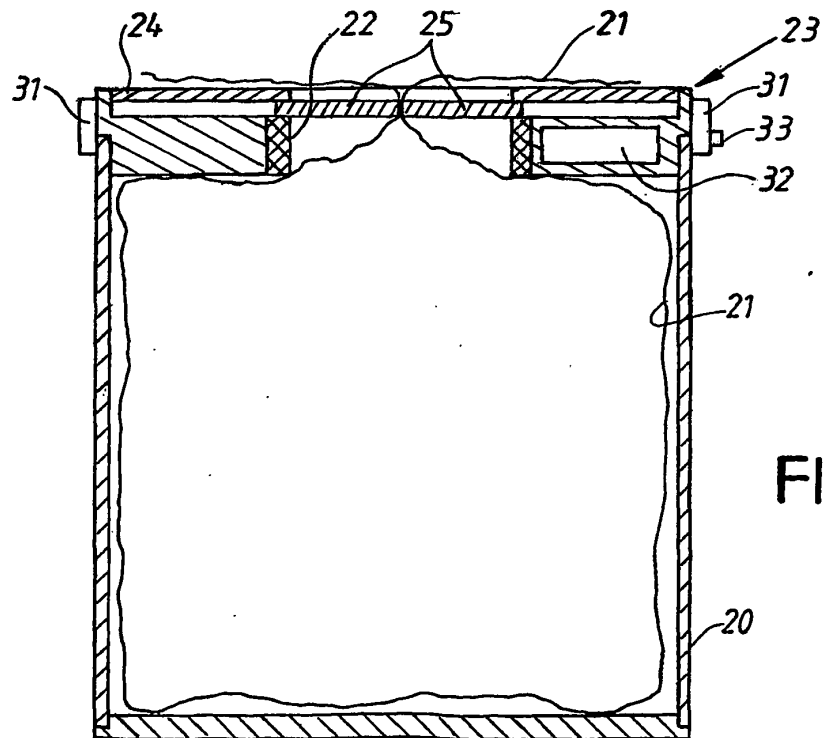
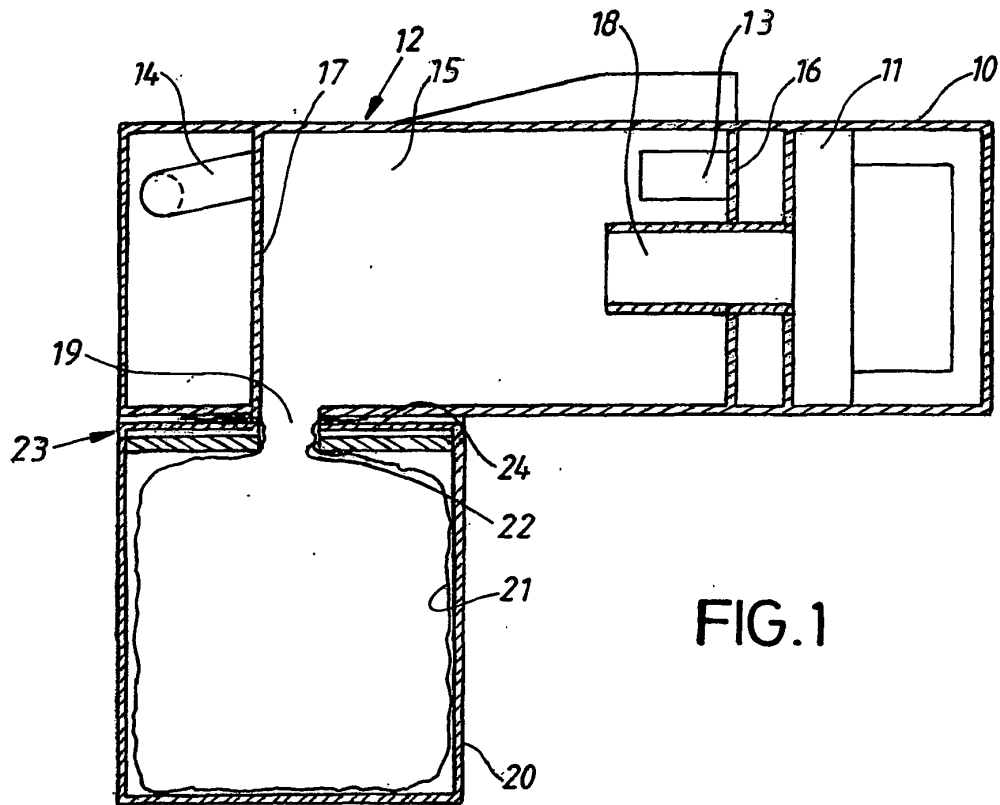
Patentansprüche

1. Staubsauger, umfassend ein Staubsaugergehäuse (10) mit einer Vakuumquelle, einem Einlass (13) für staubhaltige Luft, der mit der Vakuumquelle in Ver- bindung steht, und einem Trennungssystem, das in Luftstromrichtung gesehen nach dem Einlass ange- ordnet ist, für Partikel, die von einem Luftstrom ge- trennt werden, wobei die getrennten Partikel in we- nigstens einem Staubbeutel (21) aus einem im We- sentlichen luftdichten Material gesammelt werden, **dadurch gekennzeichnet, dass** der Staubsauger mit einer Schließ- und/oder Versiegelungsanord- nung versehen ist, durch welche der Beutel (21), der in den Staubsauger eingeführt ist, geschlossen und/ oder versiegelt werden kann, bevor der Beutel aus dem Staubsauger entfernt wird, und **dadurch**, dass er einen Behälter (20) umfasst, der den Beutel (21) umschließt, wobei der Behälter mit einem Abdek- kungsteil (23) mit einer Abdeckungsöffnung (22) ver- sehen ist, durch welche ein Teil des Beutels einge- führt ist, wobei die Schließ- und/oder Versiegelungs- anordnung im Abdeckungsteil angeordnet ist.
2. Staubsauger nach Anspruch 1, **dadurch gekenn- zeichnet, dass** die Schließ- und/oder Versiege- lungsanordnung Klemmmittel (25, 41, 43, 71, 72) umfasst, zwischen welchen der Beutel (21) einge- klemmt wird, bevor er versiegelt wird.
3. Staubsauger nach Anspruch 2, **dadurch gekenn- zeichnet, dass** das Klemmmittel (25) mit elektrisch geheizten Mitteln (30) zum Versiegeln des Beutels versehen ist.
4. Staubsauger nach Anspruch 3, **dadurch gekenn- zeichnet, dass** der Staubsauger ferner eine Batterie (32) zur Stromzufuhr zu den elektrisch geheizten Mit- teln (30) umfasst.

20 Revendications

1. Aspirateur comprenant un boîtier (10) d'aspirateur avec une source de vide, une entrée (13) pour l'air poussiéreux communiquant avec la source de vide et un système de séparation pour les particules sé- parées d'un écoulement d'air, qui est placé après l'entrée, comme observé dans la direction de l'écou- lement d'air, dans lequel les particules séparées sont collectées dans au moins un sac à poussière (21) réalisé avec un matériau principalement étanche à l'air, **caractérisé en ce que** l'aspirateur est prévu avec un agencement de fermeture et/ou de ferme- ture hermétique, grâce auquel le sac (21) inséré dans l'aspirateur peut être fermé et/ou hermétique- ment fermé avant que le sac ne soit retiré de l'aspi- rateur, et **en ce qu'il** comprend un récipient (20) en- fermant ledit sac (21), le récipient étant prévu avec une partie de couvercle (23) avec une ouverture de couvercle (22) à travers laquelle une partie du sac est insérée, dans lequel l'agencement de fermeture ou de fermeture hermétique est disposé dans la par- tie de couvercle.
2. Aspirateur selon la revendication 1, **caractérisé en ce que** l'agencement de fermeture ou de fermeture hermétique comprend des moyens de serrage (25, 41, 43, 71, 72) entre lesquels le sac (21) est bloqué avant d'être hermétiquement fermé.
3. Aspirateur selon la revendication 2, **caractérisé en ce que** les moyens de serrage (25) sont prévus avec des moyens chauffés électriquement (30) pour fer- mer hermétiquement le sac.
4. Aspirateur selon la revendication 3, **caractérisé en ce que** l'aspirateur comprend en outre une batterie (32) pour l'alimentation du courant aux moyens chauffés électriquement (30).

5. Aspirateur selon la revendication 2, **caractérisé en ce que** les moyens de serrage (41, 43) comprennent des moyens pour étirer et/ou pénétrer le matériau du sac. 5
6. Aspirateur selon la revendication 5, **caractérisé en ce que** lesdits moyens d'étirement et/ou de pénétration comprennent des parties en saillie (46) et des évidements (42) correspondants pour étirer ou pénétrer le sac. 10
7. Aspirateur selon la revendication 1 ou 2, **caractérisé en ce que** l'agencement de fermeture hermétique comprend une cassette (52) avec un rouleau de bande (53) et un dispositif de déchirement (67), l'étanchéité étant affectée par le mouvement relatif entre la cassette et l'ouverture du sac. 15
- 20
- 25
- 30
- 35
- 40
- 45
- 50
- 55



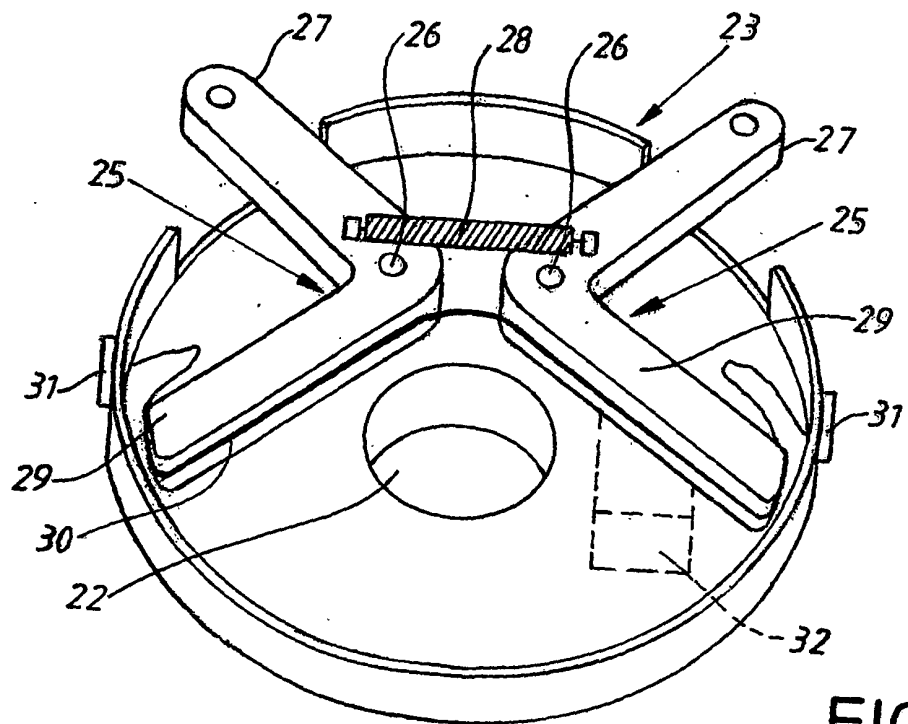


FIG. 3

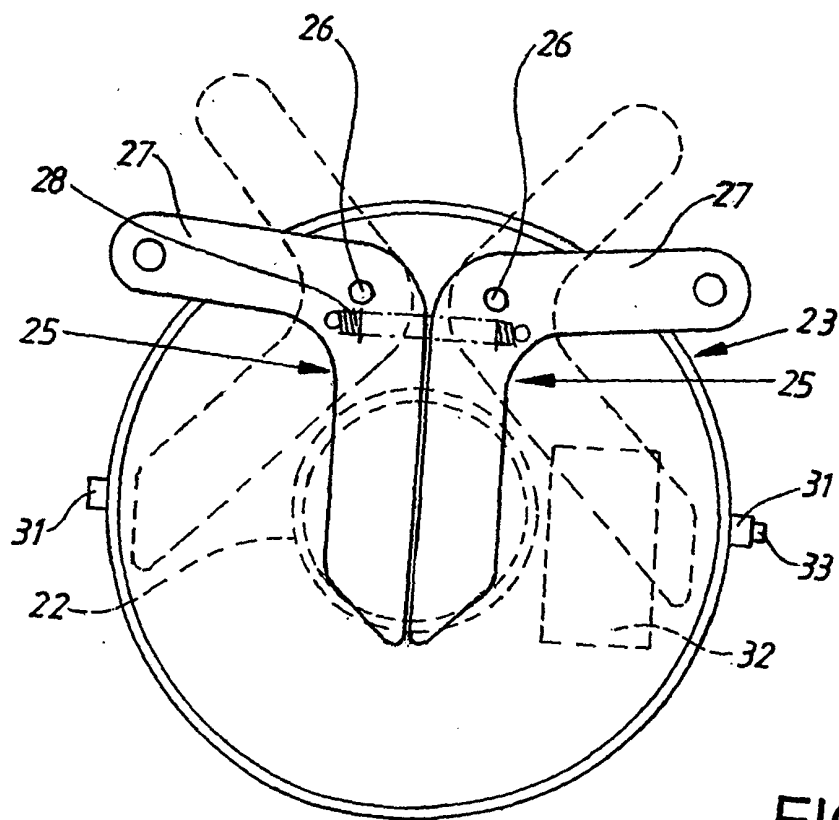


FIG. 4

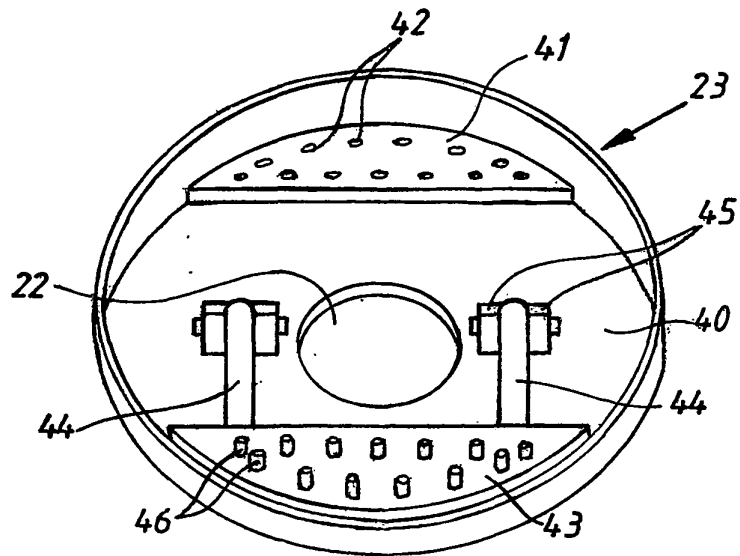


FIG. 5

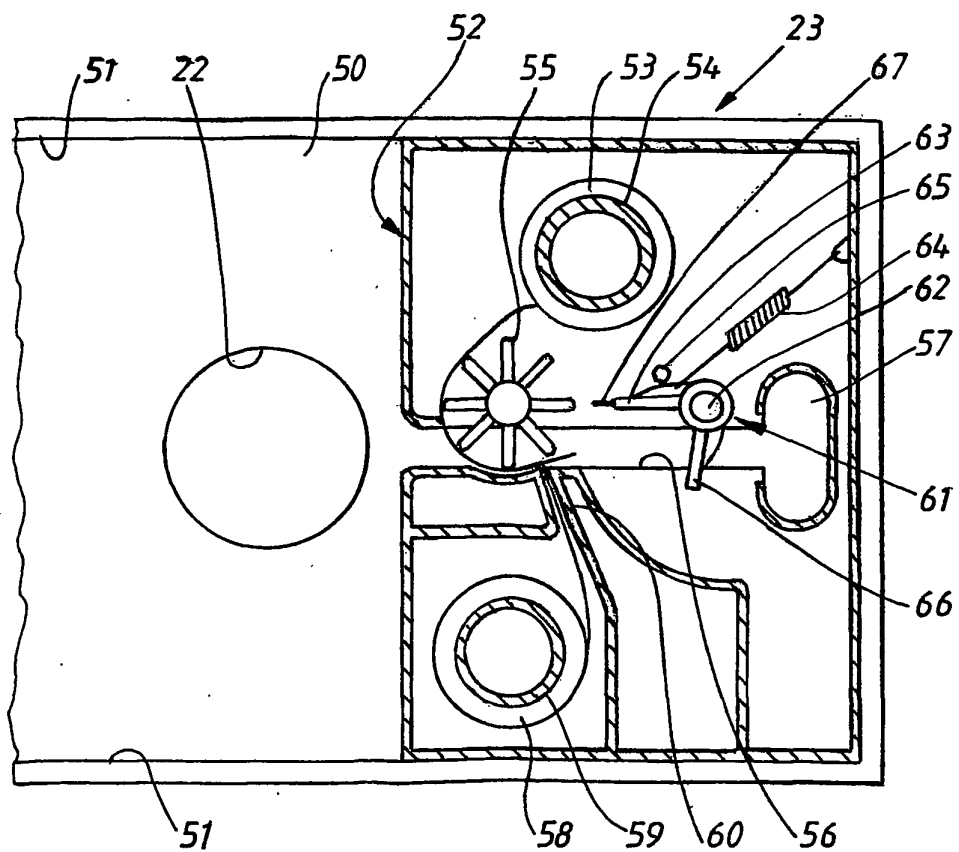


FIG. 6

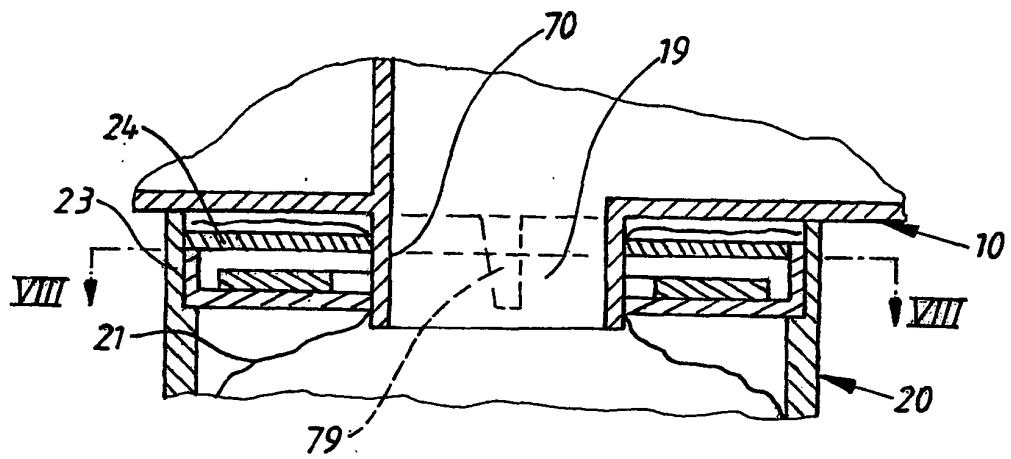


FIG. 7

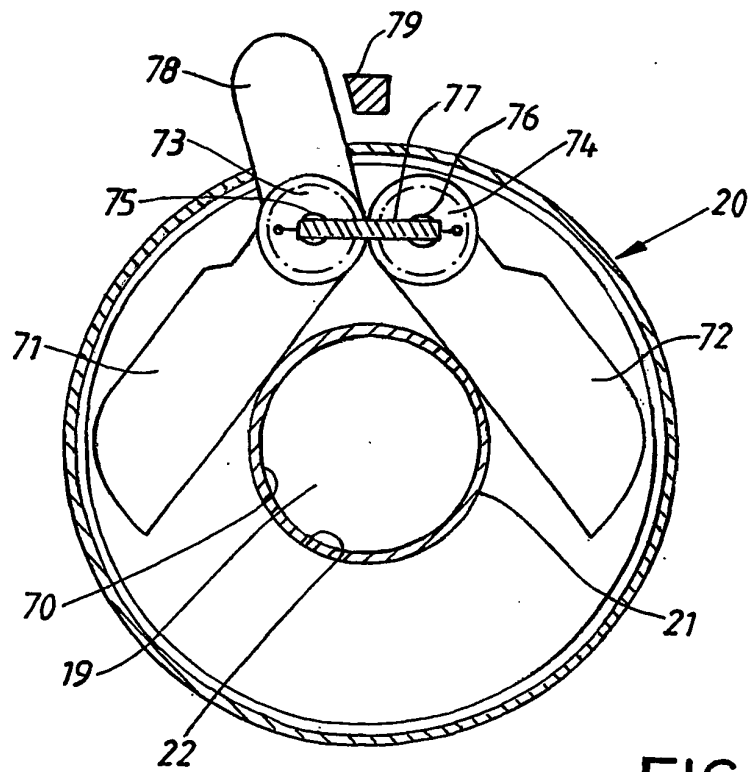


FIG. 8

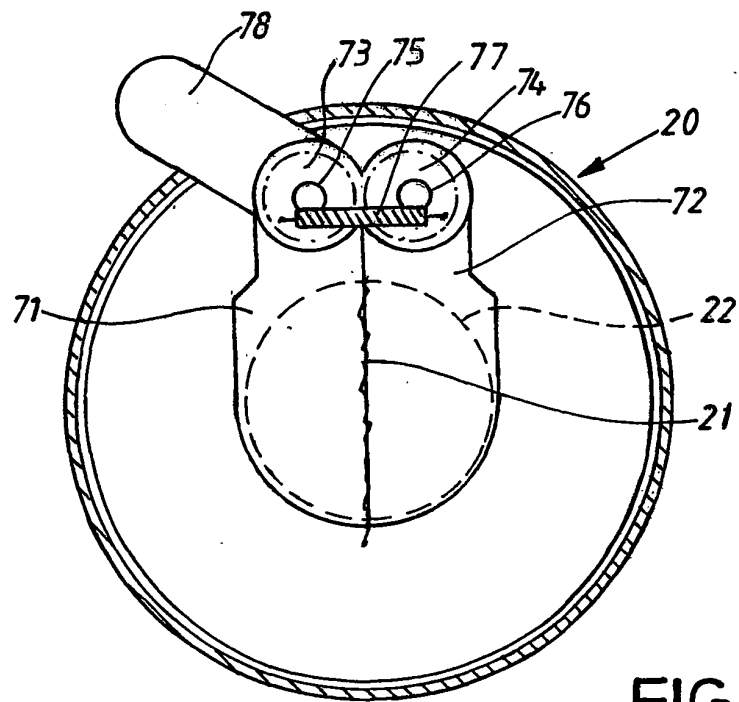


FIG. 9

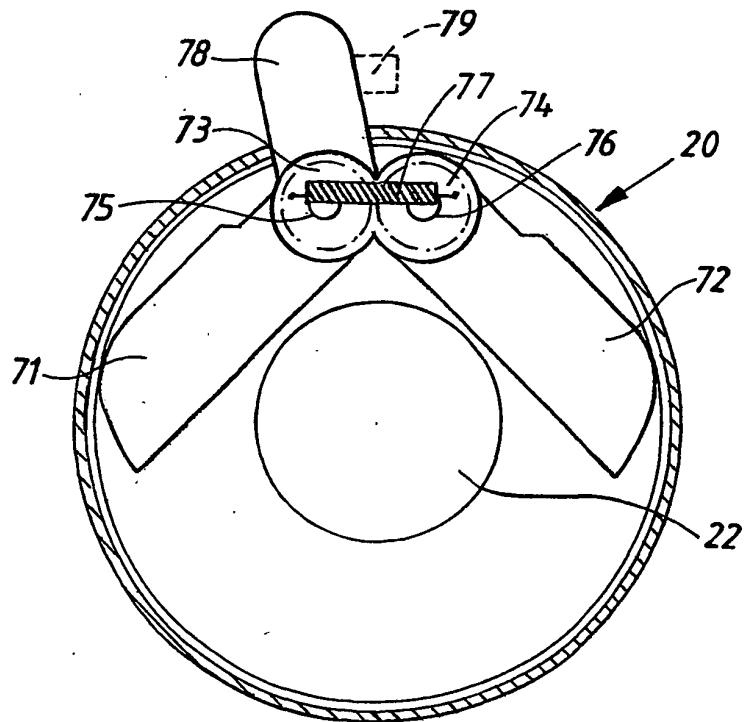


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5145499 A [0004]
- US 5090976 A [0004]
- WO 9810691 A [0005] [0007]
- SE 9800240 W [0006]