

(19)



(11)

EP 1 661 498 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
24.06.2009 Bulletin 2009/26

(51) Int Cl.:
A47L 9/02 (2006.01) A47L 9/06 (2006.01)

(21) Application number: **05290649.2**

(22) Date of filing: **24.03.2005**

(54) **Suction port assembly for vacuum cleaner**

Saugmundanordnung für Staubsauger

Ensemble d'orifice d'aspiration pour aspirateur

(84) Designated Contracting States:
DE GB

(30) Priority: **25.11.2004 KR 2004097264**

(43) Date of publication of application:
31.05.2006 Bulletin 2006/22

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Description

[0001] This application claims the benefit of Korean Patent Application No. 2004-97264 filed November 25, 2004, in the Korean Intellectual Property Office.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a vacuum cleaner, and more particularly, to a suction port assembly of a vacuum cleaner which draws in contaminant-laden air from a surface being cleaned.

2. Description of the Related Art

[0003] Generally, a vacuum cleaner cleans a surface being cleaned by use of a suction force which is generated by the driving of a vacuum source mounted inside a vacuum cleaner body. The vacuum cleaner generally includes a main body housing a contaminant chamber and a vacuum source, a suction port assembly facing the surface being cleaned and drawing in contaminant, an extension pipe guiding the contaminant drawn in through the suction port assembly into the main body, and a flexible hose.

[0004] The suction port assembly usually has a fixed configuration, and therefore, is inconvenient to use in the places such as slopes, and it is also difficult to maintain a constant level of suction efficiency. Additionally, the suction port assembly often collides with the surface being cleaned and damaged.

[0005] The above problems particularly occur in cleaning of stairways, and the problem worsens when the stairway is covered by a carpet which attracts more dusts.

[0006] US-A-5 398 361 describes a suction port assembly according to the preamble of claim 1.

SUMMARY OF THE INVENTION

[0007] The present invention has been developed in order to solve the above drawbacks and other problems associated with the conventional arrangement. An aspect of the present invention is to provide a suction port assembly of a vacuum cleaner which is capable of cleaning a surface of a certain angle.

[0008] It is another aspect of the present invention to provide a suction port assembly of a vacuum cleaner, which is capable of cleaning a carpet-covered stairway with ease.

[0009] In order to achieve the above mentioned aspects and/or other features of the present invention, it is an aspect of the present invention to have a suction port assembly for use in a vacuum cleaner, which is foldable for close contact with a sloped or angled surface being cleaned. A plurality of assembly bodies may be articulately connected with each other.

[0010] The plurality of assembly bodies comprise a first assembly body, and a second assembly body rotatably engaged with respect to the first assembly body. The second body is rotatable to a variety of interior angles with respect to the first assembly body in accordance with the slope angle of the surface being cleaned.

[0011] The first and the second assembly bodies are positioned at an interior angle of at least 60 degrees. The internal angle varies from approximately 0 degree to approximately 180 degrees.

[0012] According to one aspect of the present invention, the first assembly body comprises a suction path interconnecting to an extension pipe of the vacuum cleaner, the first and the second assembly bodies each have first and second suction holes defined at the lower sides, respectively, and the first and the second suction holes are interconnected with the suction path, respectively.

[0013] The first and the second assembly bodies comprise a plurality of bristles formed along a lower sides thereof, respectively.

[0014] For the articulate connection of the assembly bodies, there are provided a hinge groove defined in the first assembly body, a hinge protrusion formed on the second assembly body for advancement into the hinge groove, a hinge pin for engaging the hinge groove and the hinge protrusion, and an elastic member disposed on the hinge pin. The features of the invention are recited in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The above aspects and features of the present invention will be more apparent by describing certain embodiments of the present invention with reference to the accompanying drawings, in which:

[0016] FIG. 1 is a view schematically showing a vacuum cleaner having a suction port assembly according to an embodiment of the present invention;

[0017] FIG. 2 is an exploded perspective view of the suction port assembly of FIG. 1;

[0018] FIG. 3 is a view illustrating a suction port assembly according to another embodiment of the present invention; and

[0019] FIG. 4 is a view illustrating a second assembly body of the suction port assembly of FIG. 3 being folded onto a first assembly body.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0020] Certain embodiments of the present invention will be described in greater detail with reference to the accompanying drawings.

[0021] In the following description, same drawing reference numerals are used for the same elements even in different drawings. The matters defined in the description such as a detailed construction and elements are

nothing but the ones provided to assist in a comprehensive understanding of the invention. Thus, it is apparent that the present invention can be carried out without those defined matters. Also, well-known functions or constructions are not described in detail since they would obscure the invention in unnecessary detail.

[0022] Referring to FIG. 1, a vacuum cleaner 100 having a suction port assembly 200 according to an embodiment of the present invention includes a cleaner body 110 housing a contaminant chamber (not shown) and a vacuum source (not shown), an operation part 130 for operating the vacuum cleaner 100, a suction port assembly 200 drawing in contaminant-laden air from the surface being cleaned by use of suction force generated from the vacuum cleaner (not shown), a flexible hose 120 connecting the cleaner body 110 with the operation part 130, and an extension pipe 140 connecting the operation part 130 with the suction port assembly 200.

[0023] Referring to FIGS. 1 and 2, the suction port assembly 200 includes a body comprising a first assembly body 210 and a second assembly body 220.

[0024] The first assembly body 210 cleans the first cleaning surface 10. To this end, the first assembly body 210 has a suction path 213 defined at the upper end, and a first suction hole 212 defined at the lower surface of the first assembly body 210 contacting or in proximity to the first cleaning surface 10.

[0025] The suction path 213 is formed of a cylindrical pipe which may be formed integrally with or separately from the first assembly body 210. The extension pipe 140 is coupled to or in fluid communication with the suction path 213.

[0026] The first suction hole 212 may be formed to be a rectangular opening which is extended to the right open side 210a of the first assembly body 210. The first suction hole 212 directly contacts with or is in proximity to the first cleaning surface 10, and the contaminant-laden air is drawn through the first suction hole 212 from the first cleaning surface 10. A plurality of cleaning bristles 250 may be attached along the outer part of the first suction hole 212 to hit and scratch contaminants off from the first cleaning surface 10. The first suction hole 212 may take a variety of alternative configurations such as, for example, cylinders and ellipses.

[0027] The second assembly body 220 cleans the second cleaning surface 20 which is at a predetermined angle θ 1 with respect to the first cleaning surface. To this end, there is a second suction hole 222 defined at the lower side of the second assembly body 220. The first and second cleaning surfaces 10, 20 form a non-linear cleaning surface.

[0028] The second suction hole 222 is a substantially rectangular opening which extends to the left open side 220a of the second assembly body 220, and contacts directly or is in proximity with the second cleaning surface 20. Accordingly, the contaminant-laden air is drawn in through the second suction hole 222 from the second cleaning surface 20. There are a plurality of cleaning bris-

cles 250 attached along the outside of the second suction hole 222 to hit and scratch contaminants off from the second cleaning surface 20. The second suction hole 222 may take a variety of alternative configuration, such as, for example, cylinders and ellipses.

[0029] The first and the second suction holes 212 and 222 are interconnected with the suction path 213. More specifically, the first suction hole 212 is located in the first assembly body 210, so that the first suction hole 212 directly interconnects with the suction path 213.

[0030] Because the first suction hole 212 is extended to the right open side 210a of the first assembly body 210, and the second suction hole 222 is extended to the left open side 220a of the second assembly body 220, the second suction hole 222 is indirectly interconnected with the suction path 213, that is connected via the first suction hole 212.

[0031] According to the construction as described above, contaminants of the first cleaning surface 10 are drawn through the suction path 213 via the first suction hole 212, while the contaminants of the second cleaning surface 20 are drawn to the suction path 213 via the second and the first suction holes 222 and 212.

[0032] Referring to FIG. 2, the second assembly body 220 for cleaning the second cleaning surface 20, is articulately connected to be rotatable with respect to the first assembly body 210. To this end, the first assembly body 210 includes a hinge groove 211, and the second assembly body 220 includes a hinge protrusion 221 for advancement into the hinge groove 211. Additionally, a hinge pin 230 to engage the hinge groove 211 and the hinge protrusion 221 is used, and an elastic member 240 is disposed on the hinge pin 230.

[0033] In order to define the hinge groove 211, there are two supports 211a and 211b at the upper right side of the first assembly body 210. The supports 211a and 211b each include a piercing hole for the hinge pin 230 to pass therethrough, and can be formed integrally with, or separately from, the first assembly body 210.

[0034] The hinge protrusion 221 for advancement into the hinge groove 211, may be formed integrally with, or separately from, the upper left side of the second assembly body 220, and has a piercing for the hinge pin 230 to pass therethrough.

[0035] The hinge pin 230 serves as an axis on which the hinge protrusion 221 is rotatably engaged with the hinge groove 211. The hinge pin 230 is passed through the piercing holes of the supports 211 a and 211 b and then through the piercing hole of the hinge protrusion 221.

[0036] The elastic member 240, such as, for example, a coil spring or other biasing device, may be disposed on or operably connected with the hinge pin 230. The elastic member 240 may be disposed to urge the second assembly body 220 in the direction indicated by arrow B (see FIG. 1). Accordingly, when both of the first and the second cleaning surfaces 10 and 20 are planar to each other such that both are positioned at an angle θ 1 of zero degrees with respect to each other, by the urging

force of the elastic member 240, the interior angle $\theta 2$ between the first and the second assembly bodies 210 and 220 is automatically turned to 180 degree, and therefore, the second assembly body 220 is turned horizontal with respect to the first assembly body 210. When the interior angle $\theta 2$ becomes zero degrees, the second assembly body 220 is folded onto the first assembly body 210.

[0037] With the engagement structure of the first and the second assembly bodies 210 and 220 as described above, the user of the vacuum cleaner can clean both of the first cleaning surface 10 and the second slanted cleaning surface 20 in one cleaning operation or simultaneously. The cleaning method according to the present invention will be described hereinbelow in greater detail.

[0038] Referring to FIG. 1, when the slope angle $\theta 1$ of the second cleaning surface 20 with respect to the first cleaning surface 10 is large, the user of the cleaner pushes the extension pipe 140 in the direction indicated by arrow F1, and advances the suction port assembly 200 in the direction indicated by arrow F2. In such a situation, as the second assembly body 220 is moved by the pushing force of the user in the direction indicated by arrow A, the interior angle $\theta 2$ decreases.

[0039] When the angle $\theta 1$ of the second cleaning surface 20 with respect to the first cleaning surface 10 is small, the user pulls the extension pipe 140 in the direction indicated by arrow F3, and therefore, retreats the first assembly body 210 in the direction indicated by arrow F4. In such a situation, as the second assembly body 220 is moved by the urging force of the elastic member 240 in the direction indicated by the arrow FB, the interior angle $\theta 2$ increases.

[0040] According to the increase and decrease of the slope angle $\theta 1$, the interior angle $\theta 2$ between the first and the second assembly bodies 210 and 220 is varied, and according to the variance of the interior angle $\theta 2$, the first assembly body 210 may be brought into tight contact with the first cleaning surface 10, or the second assembly body 220 may be brought into tight contact with the second cleaning surface 20. Accordingly, suction efficiency deterioration of the cleaning is prevented, and damage to the suction port assembly 200 due to collision with the cleaning surfaces 10 and 20 can also be avoided.

[0041] The operation of the suction port assembly 200 as shown in FIG. 1 will now be described in greater detail.

[0042] Referring to FIGS. 1 and 2, the user varies the interior angle $\theta 2$ in accordance with the slope angle $\theta 1$, to clean the cleaning surfaces 10 and 20 in one cleaning operation. More specifically, the user pushes the extension pipe 140 in the direction indicated by arrow F1. Accordingly, the first assembly body 210 contacts with the first cleaning surface 10, and advances in the direction of arrow F2, while the second assembly body 220 is turned in the direction of arrow A, and contacts with the second cleaning surface 20. In a state that the first assembly body 210 contacts the first cleaning surface 10, and the second assembly body 220 contacts the second

cleaning surface 20, the suction port assembly 200 is moved in the direction either of arrow E or arrow F, to clean the first and the second cleaning surfaces 10 and 20.

[0043] During operation, the bristles 250 along the outer side of the first suction hole 212 hits and scratch the contaminants off from the first cleaning surface 10, so that the contaminants can be drawn to the suction path 213 via the first suction hole 212 which is defined at the lower side of the first assembly body 210.

[0044] At the same time, the bristles 250 formed along the outer side of the second suction hole 222 hit and scratch contaminants off from the second cleaning surface 20, so that the contaminants can be drawn into the suction path 213 via the second suction hole 222 which is defined at the lower side of the second assembly body 220, and the first suction hole 212 interconnected with the second suction hole 222.

[0045] After that, the contaminants at the suction path 213 are collected in the dust chamber (not shown) of the cleaner body 110 via the extension pipe 140 and the flexible hose 120.

[0046] Meanwhile, the suction port assembly 300 may be structured for the stairway cleaning purpose, as shown in FIG. 3. A reference numeral 400 denotes a carpet covering the stairway 300.

[0047] When constructed for stairway cleaning purpose, the suction port assembly 300 has the first and the second assembly bodies 310 and 320 at the interior angle $\theta 4$ constantly more than 60 degrees. More preferably, the interior angle $\theta 4$ may be fixed to 90 degrees. To this end, the right open corner 310a (see FIG. 4) of the first assembly body 310 and the left open corner 320b (see FIG. 4) of the second assembly body 320 are contacted with each other to provide for direct communication of the suction therebetween. By fixing the interior angle $\theta 4$ to 90 degrees, the slope angle $\theta 3$ between the first and the second cleaning surfaces 30 and 40 can be maintained at 90 degrees, and therefore, the interior angle $\theta 4$ does not change in operation. Furthermore, by doing as described above, the elastic member 240 (see FIG. 2) may be omitted from the suction port assembly 300 for the stairway cleaning operation, because the interior angle $\theta 4$ is not required to be automatically adjusted.

[0048] In addition, if the interior angle $\theta 4$ is fixed to a limit of 90 degrees, the suction port assembly 300 can be stowed with increased convenience when not in use, because the second assembly body 320 can be turned 90 degrees toward the first assembly body 310 so that the second assembly 320 can be folded onto the first assembly body 310. The top of the second assembly 320 is preferably adapted with a recess so as to allow for the folding of the second assembly completely over the first assembly 310 as shown in FIG. 4. The other structures will not be explained hereinbelow for these are similar to those of the suction port assembly 200 as described above with reference to FIG. 1.

[0049] The operation of the suction port assembly 300

of FIG. 3 will now be described in greater detail below.

[0050] Referring to FIG. 3, the user of the cleaner contacts the first assembly body 310 to the first cleaning surface 30, and the second assembly body 320 to the second cleaning surface 40, respectively. Unlike the structure of the suction port assembly as shown in FIGS. 1 and 2, because the slope angle θ 3 and the interior angle θ 4 are fixed to 90 degrees, the user does not need to force the extension pipe 140 to vary the interior angle θ 4 in accordance with the slope angle θ 3.

[0051] With the first assembly body 310 contacting the first cleaning surface 30 and the second assembly body 320 contacting the second cleaning surface 40, the suction port assembly 300 is moved in the direction of arrow G or arrow H, and cleans the first and the second cleaning surfaces 30 and 40. The rest of the cleaning operation will be omitted for this is similar to that which has been described above with reference to FIGS. 1 and 2.

[0052] With the suction port assembly of a vacuum cleaner as explained so far, the operator of the cleaner can clean the cleaning surfaces even with slopes, with maintained suction efficiency. Further, damage to suction port assembly due to collision with the cleaning surface, can be avoided.

[0053] The vacuum cleaner having a suction port assembly according to the present invention is especially effective for the cleaning of stairways with slope angles of 90 degrees, or carpeted areas which attract more dusts and therefore require frequent cleaning operations.

[0054] The foregoing embodiment and advantages are merely exemplary and are not to be construed as limiting the present invention. The present teaching can be readily applied to other types of apparatuses. Also, the description of the embodiments of the present invention is intended to be illustrative, and not to limit the scope of the claims, and many alternatives, modifications, and variations will be apparent to those skilled in the art.

Claims

1. A suction port assembly for use with a vacuum cleaner (100) having a vacuum source and an extension pipe, the suction port assembly comprising:

a body (200) in fluid communication with the vacuum source and being foldable for contact with a non-linear surface being cleaned.
wherein:

- the body comprises a plurality of assembly bodies (210, 220; 310, 320) articulately connected with each other,
- the plurality of assembly bodies comprises first and second assembly bodies (210, 220; 310, 320), the second assembly body (220; 320) being rotatably connected to the first assembly body (210; 310),

- the second assembly body (220; 320) is rotatable through a plurality of interior angles (θ 2) with respect to the first assembly body (210; 310) in accordance with an angle of the non-linear surface being cleaned.

characterized in that the interior angle (θ 2) varies from approximately 0 degrees to approximately 180 degrees.

2. The suction port assembly of claim 1, wherein the first and the second assembly bodies (210, 310; 220, 320) are positionable at an interior angle (θ 2) of at least 60 degrees with respect to each other.
3. The suction port assembly of claim 1, wherein the interior angle (θ 2) can be varied from approximately 0 degrees to approximately 90 degrees.
4. The suction port assembly of claim 1, wherein the first assembly body (210; 310) comprises a suction path (213) in fluid communication with the extension pipe of the vacuum cleaner, wherein the first and the second assembly bodies (210, 220; 310, 320) each have first and second suction holes (212, 222) defined at lower sides thereof, respectively, and wherein the first and the second suction holes (212, 222) are interconnected with the suction path (213), respectively.
5. The suction port assembly of claim 4, wherein the first and the second assembly bodies (210, 220; 310, 320) each comprise a plurality of bristles (250) formed along the lower sides thereof, respectively.
6. The suction port assembly of claim 1, wherein the plurality of assembly bodies (210, 220; 310, 320) are articulately connected with each other via a hinge.
7. The suction port assembly of claim 1, further comprising:
 - a hinge groove of the first assembly body;
 - a hinge protrusion (111) of the second assembly body for advancement into the hinge groove; and
 - a hinge pin (230) for connecting the hinge groove and the hinge protrusion..
8. The suction port assembly of claim 7, further comprising an elastic member (240) operably connected to the hinge pin (230).
9. A vacuum cleaner comprising:
 - a vacuum source; and
 - a suction port assembly (200) comprising a body in fluid communication with the vacuum source

and being foldable for contact with a non-linear surface being cleaned, wherein:

- the body (200) comprises a plurality of assembly bodies (210, 220; 310, 320) articulately connected with each other, 5
- the plurality of assembly bodies (210, 220; 310, 320) comprises first and second assembly bodies, the second assembly body (220; 320) being rotatably connected to the first assembly body (210; 310), 10
- the second assembly body is rotatable through a plurality of interior angles (θ_2) with respect to the first assembly body in accordance with an angle of the non-linear surface being cleaned, and 15

characterized in that the interior angle (θ_2) varies from approximately 0 degrees to approximately 180 degrees 20

10. The vacuum cleaner of claim 9, wherein, the interior angle (θ_2) can be varied from approximately 0 degrees to approximately 90 degrees. 25
11. The vacuum cleaner of claim 9, further comprising an extension pipe (140) in fluid communication with the vacuum source, wherein the first assembly body (210; 310) comprises a suction path (213) in fluid communication with the extension pipe, wherein the first and second assembly bodies each have first and second suction holes (212, 222) defined at lower sides thereof, respectively, and wherein the first and second suction holes are interconnected with the suction path, respectively. 30 35
12. The vacuum cleaner of claim 11, wherein the first and second assembly bodies each comprise a plurality of bristles (230) formed along the lower sides thereof, respectively. 40
13. The vacuum cleaner of claim 9, wherein the suction port assembly (200) further comprises a hinge assembly having a hinge groove, a hinge protrusion (221) for advancement into the hinge groove, a hinge pin (230) for connecting the hinge groove and the hinge protrusion, and an elastic member (240), wherein the hinge assembly rotatably connects the first and second assembly bodies, and wherein the elastic member biases the first and second assembly bodies. 45 50
14. A method of cleaning a non-linear surface comprising: 55

providing suction from a suction source to a suction port assembly;

pivoting a first portion of the suction port assembly with respect to a second portion of the suction port assembly at an angle that corresponds to the non-linear surface being cleaned; and moving the suction port assembly along the non-linear surface so that the first and second portions of the suction port assembly simultaneously remain in proximity to the non-linear surface, **characterized in that** the suction part assembly used in this method is conform to any one of claims 1 to 8.

Patentansprüche

1. Saugmundanordnung für die Verwendung mit einem Staubsauger (100), der eine Saugquelle und ein Verlängerungsrohr hat, wobei die Saugmundanordnung enthält:

einen Körper (200), der in Fluidverbindung mit der Saugquelle steht und geklappt werden kann, um in Kontakt mit einer nicht linearen zu reinigenden Oberfläche zu gelangen, wobei:

- der Körper eine Vielzahl von Anordnungskörpern (210, 220; 310, 320) aufweist, die gelenkig miteinander verbunden sind,
- die Vielzahl der Anordnungskörper erste und zweite Anordnungskörper (210, 220; 310, 320) enthält, wobei der zweite Anordnungskörper (220; 320) drehbar mit dem ersten Anordnungskörper (210; 310) verbunden ist,
- der zweite Anordnungskörper (220; 230) über eine Vielzahl von Innenwinkeln (θ_2) im Bezug auf den ersten Anordnungskörper (210, 310) in Übereinstimmung mit einem Winkel der nicht linearen, zu reinigenden Oberfläche gedreht werden kann,

dadurch gekennzeichnet, dass der Innenwinkel (θ_2) von etwa 0 Grad bis etwa 180 Grad variiert.

2. Saugmundanordnung nach Anspruch 1, bei der die ersten und die zweiten Anordnungskörper (210, 310; 220, 320) in einem Innenwinkel (θ_2) von wenigstens 60 Grad im Bezug zueinander angeordnet werden können.
3. Saugmundanordnung nach Anspruch 1, bei der der Innenwinkel (θ_2) von etwa 0 Grad bis etwa 90 Grad geändert werden kann.
4. Saugmundanordnung nach Anspruch 1, bei der der erste Anordnungskörper (210; 310) einen Saugweg

(213) in Fluidverbindung mit dem Verlängerungsrohr des Staubsaugers enthält, wobei die ersten und zweiten Anordnungskörper (210, 220; 310, 320) jeweils erste und zweite Sauglöcher (212, 222) haben, die jeweils an ihren Unterseiten ausgebildet sind, und die ersten sowie die zweiten Sauglöcher (212, 222) jeweils mit dem Saugweg (213) verbunden sind.

5. Saugmundanordnung nach Anspruch 4, bei der die ersten und die zweiten Anordnungskörper (210, 220; 310, 320) jeweils eine Vielzahl von Borsten (250) haben, die jeweils entlang ihrer Unterseiten ausgebildet sind.

6. Saugmundanordnung nach Anspruch 1, bei der die Vielzahl von Anordnungskörpern (210, 220; 310, 320) gelenkig miteinander über ein Scharnier verbunden sind.

7. Saugmundanordnung nach Anspruch 1, weiterhin enthaltend:

eine Scharniernut des ersten Anordnungskörpers;
einen Scharniervorsprung (221) des zweiten Anordnungskörpers, der in die Scharniernut geschoben wird; und
einen Scharnierstift (230), der die Scharniernut und den Scharniervorsprung verbindet.

8. Saugmundanordnung nach Anspruch 7, weiterhin enthaltend ein elastisches Element (240) das wirkungsmäßig mit dem Scharnierstift (230) verbunden ist.

9. Staubsauger, enthaltend:

eine Saugquelle; und
eine Saugmundanordnung, die einen Körper (200) enthält, der in Fluidverbindung mit der Saugquelle steht und geklappt werden kann, um in Kontakt mit einer nicht linearen zu reinigenden Oberfläche zu gelangen, wobei:

- der Körper (200) eine Vielzahl von Anordnungskörpern (210, 220; 310, 320) aufweist, die gelenkig miteinander verbunden sind,
- die Vielzahl der Anordnungskörper (210, 220; 310, 320) erste und zweite Anordnungskörper enthält, wobei der zweite Anordnungskörper (220; 320) drehbar mit dem ersten Anordnungskörper (210; 310) verbunden ist,
- der zweite Anordnungskörper über eine Vielzahl von Innenwinkeln ($\theta 2$) im Bezug

auf den ersten Anordnungskörper in Übereinstimmung mit einem Winkel der nicht linearen, zu reinigenden Oberfläche gedreht werden kann, und

dadurch gekennzeichnet, dass der Innenwinkel ($\theta 2$) von etwa 0 Grad bis etwa 180 Grad variiert.

10. Staubsauger nach Anspruch 9, bei dem der Innenwinkel ($\theta 2$) von etwa 0 Grad bis etwa 90 Grad geändert werden kann.

11. Staubsauger nach Anspruch 9, weiterhin enthaltend ein Verlängerungsrohr (140) in Fluidverbindung mit der Saugquelle, wobei der erste Anordnungskörper (210; 310) einen Saugweg (213) in Fluidverbindung mit dem Verlängerungsrohr enthält, die ersten und die zweiten Anordnungskörper erste und zweite Sauglöcher (212, 222) haben, die an ihren jeweiligen Unterseiten ausgebildet sind und die ersten und zweiten Sauglöcher jeweils mit dem Saugweg verbunden sind.

12. Staubsauger nach Anspruch 11, bei dem die ersten und zweiten Anordnungskörper jeweils eine Vielzahl von Borsten (230) enthalten, die jeweils entlang ihrer Unterseiten ausgebildet sind.

13. Staubsauger nach Anspruch 9, bei dem die Saugmundanordnung weiterhin eine Scharnieranordnung enthält, die eine Scharniernut, einen Scharniervorsprung (221) für das Einschieben in die Scharniernut, einen Scharnierstift (230) für die Verbindung der Scharniernut mit dem Scharniervorsprung und ein elastisches Element (240) hat, wobei die Scharnieranordnung die erste und zweiten Anordnungskörper drehbar verbindet und das elastische Element die ersten und zweiten Anordnungskörper vorspannt.

14. Verfahren zum Reinigen einer nicht linearen Oberfläche, umfassend:

Bereitstellen eines Unterdrucks von der Saugquelle für eine Saugmundanordnung;
Schwenken eines ersten Abschnittes der Saugmundanordnung im Bezug auf einen zweiten Abschnitt der Saugmundanordnung in einem Winkel, der der nicht linearen, zu reinigenden Oberfläche entspricht; und
Bewegen der Saugmundanordnung entlang der nicht linearen Oberfläche, so dass die ersten und zweiten Abschnitte der Saugmundanordnung gleichzeitig in der Nähe der nicht linearen Oberfläche bleiben,

dadurch gekennzeichnet, dass die Saugmundan-

ordnung, die bei diesem Verfahren verwendet wird, mit einem der Ansprüche 1 bis 8 konform ist.

Revendications

1. Ensemble d'orifice d'aspiration à utiliser avec un aspirateur (100) comprenant une source d'aspiration et un tuyau d'extension, l'ensemble d'orifice d'aspiration comprenant :

un corps (200) en communication fluidique avec la source d'aspiration et étant pliable pour entrer en contact avec une surface non linéaire étant nettoyée, dans lequel :

- le corps comprend une pluralité de corps d'assemblage (210, 220 ; 310, 320) mutuellement reliés de manière articulée,
- la pluralité de corps d'assemblage comprend un premier et un second corps d'assemblage (210, 220 ; 310, 320), le second corps d'assemblage (220 ; 320) étant relié de manière rotative au premier corps d'assemblage (210 ; 310),
- le second corps d'assemblage (220 ; 320) peut tourner sur une pluralité d'angles intérieurs (θ_2) par rapport au premier corps d'assemblage (210 ; 310) conformément à un angle de la surface non linéaire étant nettoyée,

caractérisé en ce que l'angle intérieur (θ_2) va d'environ 0 degré à environ 180 degrés.

2. Ensemble d'orifice d'aspiration selon la revendication 1, dans lequel le premier et le second corps d'assemblage (210, 310 ; 220, 320) peuvent être positionnés à un angle intérieur (θ_2) d'au moins 60 degrés l'un par rapport à l'autre.

3. Ensemble d'orifice d'aspiration selon la revendication 1, dans lequel l'angle intérieur (θ_2) peut varier pour aller d'environ 0 degré à environ 90 degrés.

4. Ensemble d'orifice d'aspiration selon la revendication 1, dans lequel le premier corps d'assemblage (210 ; 310) comprend un passage d'aspiration (213) en communication fluidique avec le tuyau d'extension de l'aspirateur, dans lequel le premier et le second corps d'assemblage (210, 220 ; 310, 320) ont chacun un premier et un second trou d'aspiration (212, 222) définis dans des côtés inférieurs de ceux-ci, respectivement, et dans lequel le premier et le second trou d'aspiration (212, 222) sont interconnectés avec le passage d'aspiration (213), respectivement.

5. Ensemble d'orifice d'aspiration selon la revendication 4, dans lequel le premier et le second corps d'assemblage (210, 220 ; 310, 320) comprennent chacun une pluralité de fibres (250) formées le long des côtés inférieurs de ceux-ci, respectivement.

6. Ensemble d'orifice d'aspiration selon la revendication 1, dans lequel les multiples corps d'assemblage (210, 220 ; 310, 320) sont mutuellement reliés de manière articulée par l'intermédiaire d'une charnière.

7. Ensemble d'orifice d'aspiration selon la revendication 1, comprenant en outre :

une rainure d'articulation du premier corps d'assemblage ;
une saillie d'articulation (111) du second corps d'assemblage conçue pour s'étendre dans la rainure d'articulation ; et
une broche d'articulation (230) pour relier la rainure d'articulation et la saillie d'articulation.

8. Ensemble d'orifice d'aspiration selon la revendication 7, comprenant en outre un élément élastique (240) fonctionnellement relié à la broche d'articulation (230).

9. Aspirateur, comprenant :

une source d'aspiration ; et
un ensemble d'orifice d'aspiration (200), comprenant un corps en communication fluidique avec la source d'aspiration et étant pliable pour entrer en contact avec une surface non linéaire étant nettoyée, dans lequel :

- le corps (200) comprend une pluralité de corps d'assemblage (210, 220 ; 310, 320) mutuellement reliés de manière articulée,
- la pluralité de corps d'assemblage (210, 220 ; 310, 320) comprend un premier et un second corps d'assemblage, le second corps d'assemblage (220 ; 320) étant relié de manière rotative au premier corps d'assemblage (210 ; 310),
- le second corps d'assemblage peut tourner sur une pluralité d'angles intérieurs (θ_2) par rapport au premier corps d'assemblage conformément à un angle de la surface non linéaire étant nettoyée, et

caractérisé en ce que l'angle intérieur (θ_2) va d'environ 0 degré à environ 180 degrés.

10. Aspirateur selon la revendication 9, dans lequel l'angle intérieur (θ_2) peut varier pour aller d'environ 0

degré à environ 90 degrés.

11. Aspirateur selon la revendication 9, comprenant en outre un tuyau d'extension (140) en communication fluïdique avec la source d'aspiration, dans lequel le premier corps d'assemblage (210;310) comprend un passage d'aspiration (213) en communication fluïdique avec le tuyau d'extension, dans lequel le premier et le second corps d'assemblage ont chacun un premier et un second trou d'aspiration (212, 222) définis dans des côtés inférieurs de ceux-ci, respectivement, et dans lequel le premier et le second trou d'aspiration sont interconnectés avec le passage d'aspiration, respectivement.

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12. Aspirateur selon la revendication 11, dans lequel le premier et le second corps d'assemblage comprennent chacun une pluralité de fibres (230) formées le long des côtés inférieurs de ceux-ci, respectivement.

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13. Aspirateur selon la revendication 9, dans lequel l'ensemble d'orifice d'aspiration (200) comprend en outre un ensemble d'articulation comprenant une rainure d'articulation, une saillie d'articulation (221) conçue pour s'étendre dans la rainure d'articulation, une broche d'articulation (230) pour relier la rainure d'articulation et la saillie d'articulation, et un élément élastique (240), dans lequel l'ensemble d'articulation relie de manière rotative les premier et second corps d'assemblage, et dans lequel l'élément élastique sollicite les premier et second corps d'assemblage.

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14. Procédé de nettoyage d'une surface non linéaire, comprenant les étapes consistant à :

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fournir une force d'aspiration à un ensemble d'orifice d'aspiration, à partir d'une source d'aspiration ;

faire pivoter une première partie de l'ensemble d'orifice d'aspiration par rapport à une seconde partie de l'ensemble d'orifice d'aspiration, à un angle qui correspond à la surface non linéaire étant nettoyée ; et

déplacer l'ensemble d'orifice d'aspiration le long de la surface non linéaire de manière à ce que les première et seconde parties de l'ensemble d'orifice d'aspiration restent simultanément à proximité de la surface non linéaire,

caractérisé en ce que l'ensemble d'orifice d'aspiration utilisé dans ledit procédé est conforme à l'une quelconque des revendications 1 à 8.

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FIG. 1

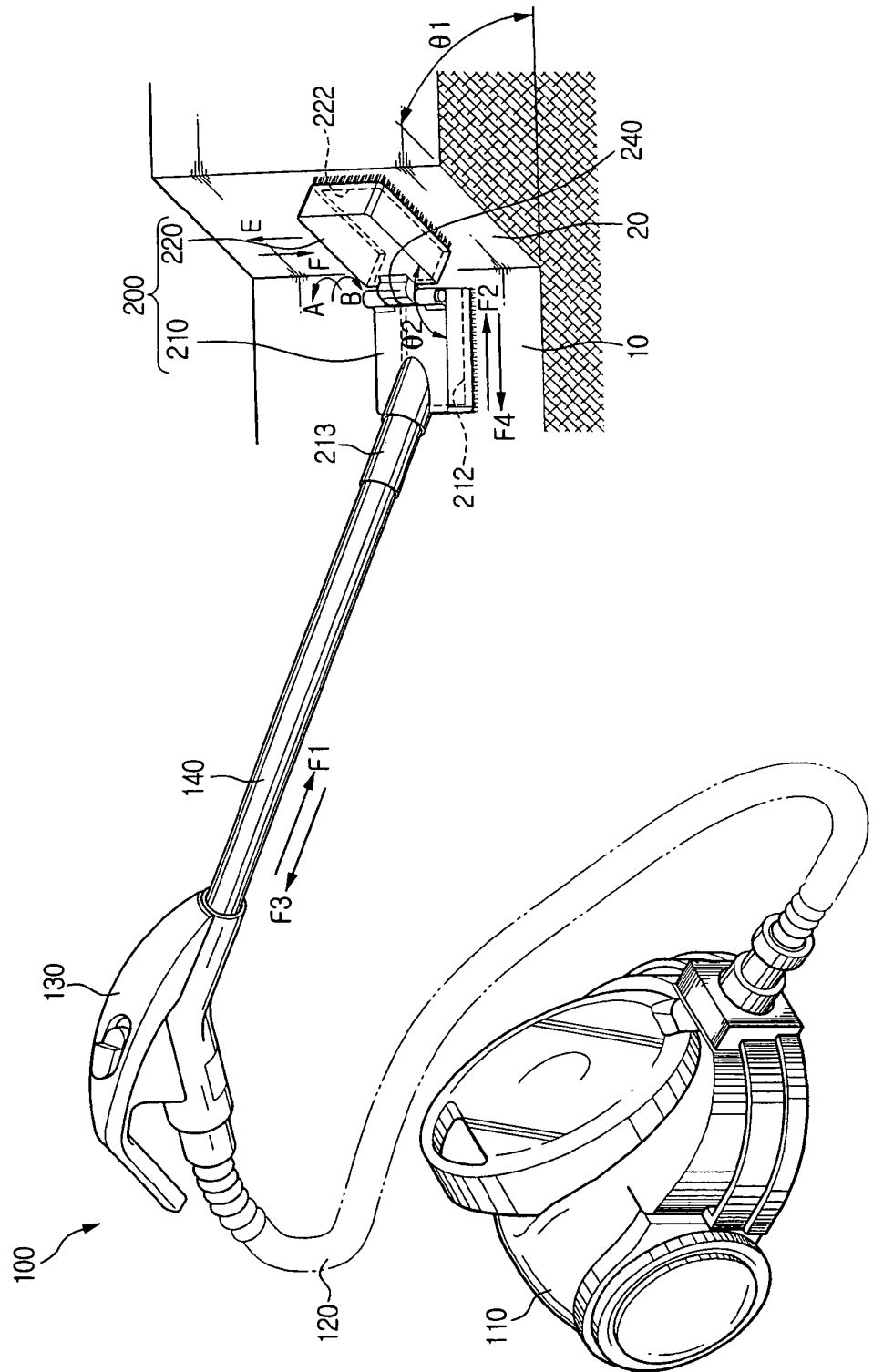


FIG. 2

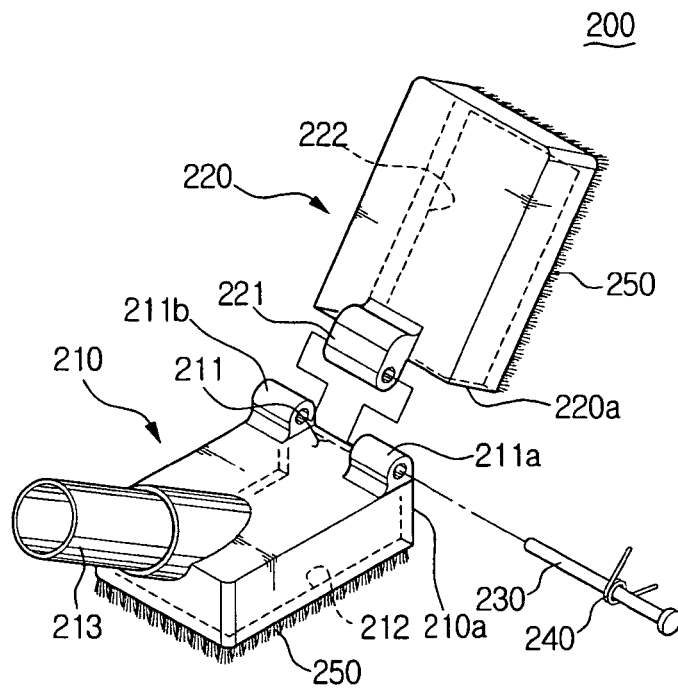


FIG. 3

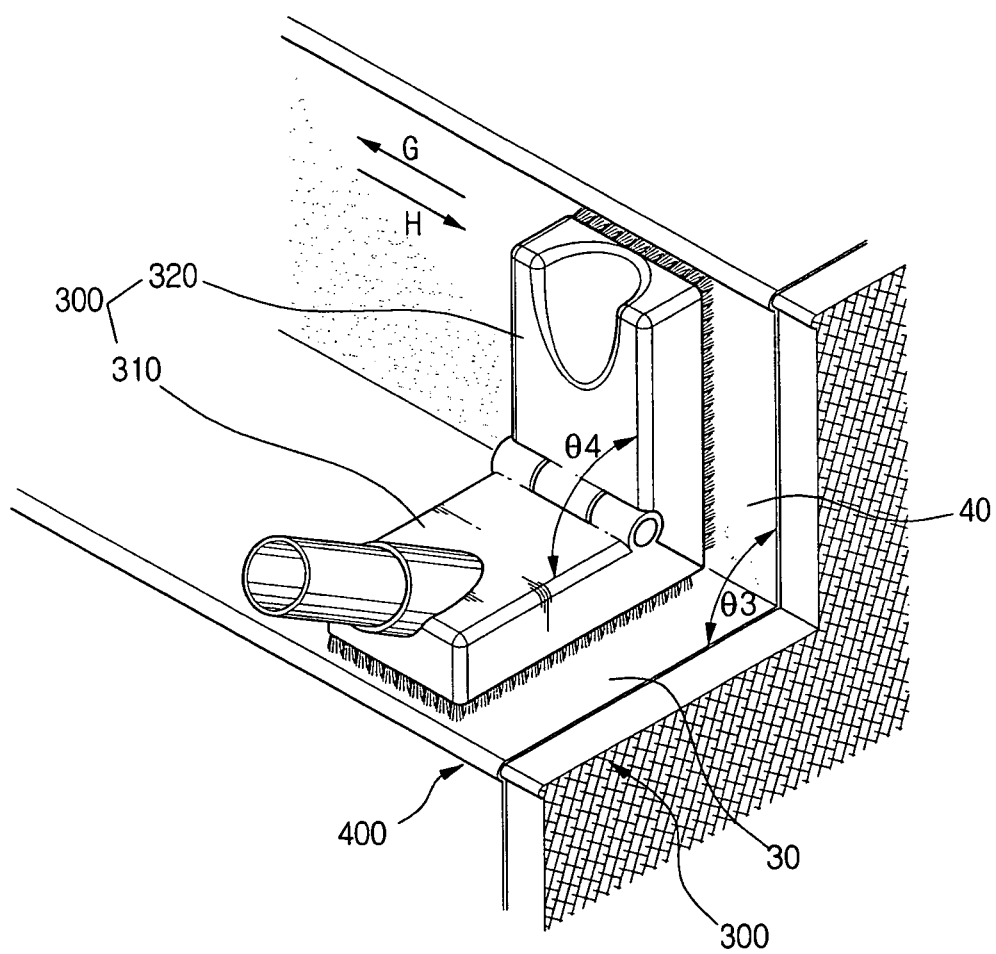
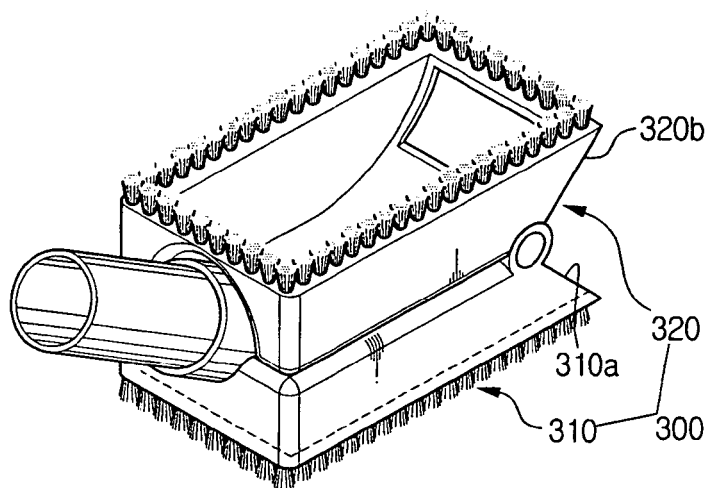


FIG. 4



REFERENCES CITED IN THE DESCRIPTION

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