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(71) Applicant: **Nilfisk A/S**
2100 Copenhagen Ø (DK)

(72) Inventors:
- **ZHU, Junjun**
  Suzhou, 215000 (CN)
- **WU, Yifan**
  Suzhou, 215000 (CN)
- **ZHU, Zhiqing**
  Kunshan, 215300 (CN)
- **TANG, An**
  Suzhou, 215000 (CN)
- **SHANG, Lianchao**
  Suzhou, 215000 (CN)

(74) Representative: **Plougmann Vingtoft a/s**
Strandvejen 70
2900 Hellerup (DK)

(54) SUCTION NOZZLE AND VACUUM CLEANER COMPRISING A SUCTION NOZZLE

(57) The invention relates to a suction nozzle (100), the suction nozzle (100) comprising a bottom part (B) and a distance adjustment device (D), the bottom part (B) being configured to face a surface to be cleaned, the bottom part (B) comprising a suction mouth (10), a first bottom face (11) and a second bottom face (12), the first bottom (11) and the second bottom face (12) being configured at two sides of the suction mouth (10) relatively, the distance adjustment device (D) being connected to the bottom part (B), and the position of the distance adjustment device (D) relative to the bottom part (B) is adjustable so that the distance from the suction mouth (10) and the surface to be cleaned is adjustable, wherein:
the suction nozzle (100) being able to get contact with a flat surface to define a virtual surface (VS), at least part of the first bottom face (11) being inclined relative to the virtual surface (VS) to form a first slope (111), at least part of the second bottom face (12) being inclined relative to the virtual surface (VS) to form a second slope (121), a plurality of interval protrusions (21) being configured on the first slope (111) protruding towards the virtual surface (VS) and a plurality of interval protrusions (22) being configured on the second slope (121) protruding towards the virtual surface (VS), a guide channel (30) being generated between every two adjacent protrusions (21, 22), at every adjustment position of the distance adjustment device (D), the protrusions (20) being out of touch of the virtual surface (VS).

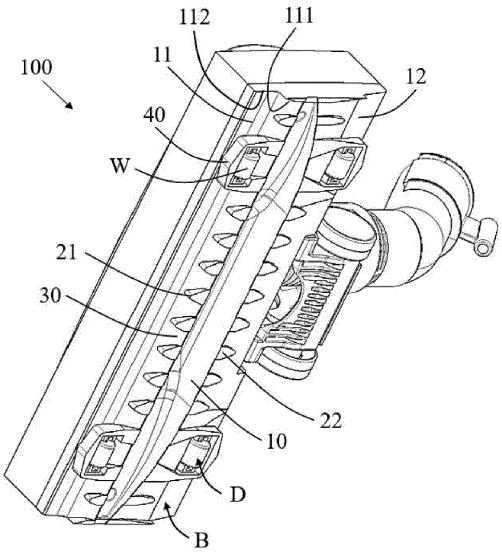

FIG. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the technical field of cleaning, more specifically to a suction nozzle and a vacuum cleaner comprising a suction nozzle.

BACKGROUND OF THE INVENTION

[0002] The suction nozzle of a vacuum cleaner could slide on a surface to be cleaned, for example on a floor, and to suck dirt (e.g. dust and debris).

[0003] During the suction process, on one hand, a large suction force is expected, for a large suction force could suck dirt effectively; however, on the other hand, too large suction force will add friction between suction nozzle and floor, which adds difficulty to users when moving the suction nozzle, bad for energy saving.

SUMMARY OF THE INVENTION

[0004] Hence, an improved suction nozzle and a vacuum cleaner having such an improved suction nozzle would be advantageous, and in particular a more energy efficient and/or easily operated nozzle would be advantageous.

[0005] In particular, it may be seen as an object of the present invention to provide a suction nozzle that solves the above mentioned problems, to provide enough suction force to clean debris and dust as well as to be easy for users to move on the surface to be cleaned.

[0006] In a first aspect, the invention provides a suction nozzle, the suction nozzle comprising a bottom part and a distance adjustment device, the bottom part being configured to face a surface to be cleaned, the bottom part comprising a suction mouth, a first bottom face and a second bottom face, the first bottom and the second bottom face being configured at two sides of the suction mouth relatively, the distance adjustment device being connected to the bottom part, and the position of the distance adjustment device relative to the bottom part being adjustable so that the distance from the suction mouth and the surface to be cleaned being adjustable, wherein:

the suction nozzle being able to get contact with a flat surface to define a virtual surface, at least part of the first bottom face being inclined relative to the virtual surface to form a first slope, at least part of the second bottom face being inclined relative to the virtual surface to form a second slope,

a plurality of interval protrusions being configured on the first slope and the second slope protruding towards the virtual surface, a guide channel being generated between every two adjacent protrusions,

at every adjustment position of the distance adjustment device, the protrusions being out of touch of the virtual surface.

[0007] The invention is particularly, but not exclusively, advantageous for obtaining a good cleaning effect, as well as reducing the operation force of a user and saving energy. Also, the structure of protrusion, as well as its matching with the first slope and the second slope could easily guide dirt into suction mouth.

[0008] In some embodiments, wherein the protrusions extend to the edge of the suction mouth, and at the edge, the distance from the part of the protrusions furthest away from the first slope to the first slope is between 0 and 2 mm, and the distance from the part of the protrusions furthest away from the second slope to the second slope is between 0 and 2 mm, or more optimally, at the edge, the distance from the part of the protrusions furthest away from the first slope to the first slope is between 0.5 and 1 mm, and the distance from the part of the protrusions furthest away from the second slope to the second slope is between 0.5 and 1 mm.

[0009] In some embodiments, wherein the distance between the protrusions and the virtual surface is between 0.5 mm and 4 mm.

[0010] In some embodiments, in a case when the suction nozzle is used to clean a hard surface, the distance adjustment device being at a first position, the distance between the protrusions and the virtual surface is between 0.5 mm and 3 mm, or more optimally, the distance between the protrusions and the virtual surface is between 1.5 mm and 2 mm, and wherein in a case when the suction nozzle is used to clean carpet, the distance adjustment device being at a second position, the distance between the protrusions and the virtual surface is between 1.5 mm and 4 mm, or more optimally, the distance between the protrusions and the virtual surface is between 2 mm and 3.5 mm.

[0011] In some embodiments, the surface of the protrusions facing the virtual surface is parallel to the virtual surface.

[0012] In some embodiments, the first bottom face further comprises a flat area adjacent to the first slope, the flat area being farther away from the suction mouth than the first slope, the flat area being configured with no said protrusions.

[0013] Specially, the distance between the flat area and the virtual surface is between 3 mm and 20 mm, or more optimally, the distance between the flat area and the virtual surface is between 5 mm and 15 mm.

[0014] In some embodiments, the closer the position to the suction mouth is, the narrower the guide channel is. Especially, at the position of the suction mouth, the width of the guide channel is no less than 5mm, or more optimally, wherein at the position of the suction mouth, the width of the guide channel is between 5 mm and 20 mm.

[0015] In some embodiments, the distance adjustment device is configured with at least one extension, the bottom part forming an opening, the extension partly passing through the opening and being used for getting contact with the virtual surface.

[0016] The extension, especially the extension with the shape of wheel, which is used for contacting the surface to be contacted, defines a gap between the surface to be cleaned and the first bottom face/the second bottom face. Thereby it is obtained that dirt will not easily get stuck with the suction nozzle.

[0017] In an embodiment, the bottom part at one side of the extension facing away from the suction mouth forms a second protrusion protruding the first bottom face or the second bottom face, the second protrusion being formed with one or more guide surfaces configured to lead objects away from the extension.

[0018] In an embodiment, part of the second protrusion extends to a side of the extension closer to the suction mouth, at the side of the extension closer to the suction mouth being formed with a concave part partly surrounded by the second protrusion, the concave part being interconnected with the suction mouth.

[0019] In an embodiment, the concave part is flared, or in other words, the concave part is larger at one end than the other, the closer the position to the suction mouth, the smaller the width of the concave part is getting.

[0020] In some embodiments, between the first slope and the virtual surface forms a first angle, and between the second slope and the virtual surface forms a second angle, the first slope being at the forward direction of the suction nozzle, the second slope being at the backward direction of the suction nozzle, the first angle being larger than or equal to the second angle.

[0021] In some embodiments, the first angle is between 15° and 45°, or more optimally, the first angle is between 15° and 30°, and the second angle is between 5° and 45°, or more optimally, the second angle is between 5° and 30°.

[0022] In a second aspect, the invention provides a vacuum cleaner which comprises the suction nozzle according to the first aspect of the invention.

[0023] It is appreciated that the same advantages and embodiments described for the first aspect apply as well for the second aspects. Further, it is appreciated that the described embodiments can be intermixed in any way between all the mentioned aspects.

[0024] As used herein, the term "virtual surface" is meant to denote an ideal flat surface in relation to which distances of the parts of the suction nozzle are described. In real world, a surface to be cleaned, for example a floor surface, will not be that flat. Such uneven surface may not be precise as a base plane when measuring the distances of the parts of the suction nozzle. But in an ideal case that the suction nozzle is positioned for cleaning an ideal flat floor surface, the virtual surface and the ideal flat floor surface would coincide.

BRIEF DESCRIPTION OF THE FIGURES

[0025] The apparatus and method according to the invention will now be described in more detail with regard to the accompanying figures. The figures show one way of implementing the present invention and is not to be construed as being limiting to other possible embodiments falling within the scope of the attached claim set.

FIG. 1 is a perspective view of a suction nozzle according to an embodiment of the present disclosure.
FIG. 2 is a vertical view of a suction nozzle according to an embodiment of the present disclosure.
FIG. 3 is a cross sectional view of a suction nozzle according to an embodiment of the present disclosure when its button being at a first working position.
FIG. 4 is a cross sectional view of a suction nozzle according to an embodiment of the present disclosure when its button being at a second working position.
FIG. 5 is an enlarged illustration of part as per FIG. 4.
FIG. 6 is a cross sectional view of a suction nozzle according to an embodiment of the present disclosure.

DESCRIPTION OF REFERENCE SIGNS

[0026]

100: suction nozzle
B: bottom part
D: distance adjustment device
W: extension
T: button
VS: virtual surface
P: opening
10: suction mouth
11: first bottom face
12: second bottom face
111: first slope
112: flat area
121: second slope
21, 22: protrusion
30: guide channel
40: second protrusion
41: outer protrusion
42: inner protrusion
50: concave part
α : first angle
β : second angle

DETAILED DESCRIPTION OF AN EMBODIMENT

[0027] An exemplary embodiment of a suction nozzle 100 according to the invention, which is shown in FIGS. 1 to 6. The suction nozzle 100 in this embodiment could be connected to a main body of a vacuum machine, to suck dirt into the vacuum machine.

[0028] The following introduction would be described based on the positional relationship according to FIGS. 1 to 6. However, it should be understood, when the suction nozzle 100 is used in different scenes or in different

positions, the parts of the suction nozzle 100 will have different positional relationships.

[0029] The suction nozzle 100 comprises a bottom part B and a distance adjustment device D.

[0030] The bottom part B has a bottom face which is configured to face a surface to be cleaned (e.g. a floor). In approximately the middle of the bottom face forms a suction mouth 10. Dirt on the surface to be cleaned, or in other words dirt to be cleaned, for example dust or debris, could be sucked through suction mouth 10.

[0031] The distance adjustment device D is movably connected to the bottom part B. So that according to various surfaces to be cleaned with different properties, the distance L1 between bottom part B and the surface to be cleaned could be adjusted.

[0032] In this embodiment, the bottom part B has a box shape. The distance adjustment device D is partly contained inside the bottom part B. And in a direction facing the surface to be cleaned, the distance adjustment device D partly extends out of the bottom part B, and forms an extension W.

[0033] In this embodiment, the extension W is a group of wheels. The wheels are rotatable to the main body of the distance adjustment device D, helping the suction nozzle 100 easily move on the surface to be cleaned.

[0034] In other embodiments, the extension W could also be one or more balls, or bristles, or a combination of the above features.

[0035] The extension W is used to directly contact the surface to be cleaned, which could space out the bottom part B and the surface to be cleaned.

[0036] A spring is set between the distance adjustment device D and the bottom part B, which is not shown in the figures. The distance adjustment device D touches a button T on its upper part. And the button T has two working positions.

[0037] Refer to FIG. 3, with the button T in its first working position, the distance L1 that the extension W extending out of the bottom part B is relatively small. The distance L1 is 0.5 mm to 3 mm, or preferably 1.5 mm to 2 mm. In this situation, we also call that the distance adjustment device D is in its first position. This situation is particularly used for a hard surface to be cleaned, for example a floor.

[0038] Refer to FIG. 4, with the button T in its second working position, the distance L1 that the extension W extending out of the bottom part B is relatively large. The distance L1 is 1.5 mm to 4 mm, or preferably 2 mm to 3.5 mm. In this situation, we also call that the distance adjustment device D is in its second position. This situation is particularly used for a soft surface to be cleaned, for example a carpet.

[0039] At both sides (front side F and rear side R) of the bottom part B on the bottom part B forms a first bottom face 11 and a second bottom face 12.

[0040] Part of the first bottom face 11 forms a first slope 111, and part of the second bottom face 12 forms a second slope 121. Both the first slope 111 and the second slope 121 is inclined to a flat surface to be cleaned; or a following definition is made: the contacting points between the suction nozzle 100 and the surface to be cleaned, in other words the contact points of the multi extensions W and the surface to be cleaned, altogether define a virtual surface VS, so the first slope 111 and the second slope 121 are both inclined to the virtual surface VS. The inclined directions of the first slope 111 and the second slope 121 are opposite. Along the front and rear direction in the figures, the closer to the suction mouth 10, the first slope 111 or the second slope 121 is closer to the virtual surface VS.

[0041] A first angle α is formed between the first slope 111 and the virtual surface VS. A second angle β is formed between the second slope 121 and the virtual surface VS. More preferably, the first angle α is larger or equals to the second angle β. Since in a regular operation mode, the first slope 111 is at the forward direction of the suction nozzle 100, and the second slope 121 is at the backward direction of the suction nozzle 100. When a user moves the suction nozzle 100 in a forward direction, the user push the suction nozzle 100; and when a user moves the suction nozzle 100 in a backward direction, the user pull the suction nozzle 100. In a pull operation, the suction nozzle 100 tends to get close to the surface to be cleaned; while in a push operation, the suction nozzle 100 tends to be lifted and get far away from the surface to be cleaned.

[0042] Preferably, the first angle α is between 15° to 45° , or more preferably, the first angle α is between 15° to 30° . Preferably, the second angle β is between 5° to 45° , or more preferably, the second angle β is between 5° to 30° .

[0043] The first slope 111 and the second slope 121 both partly protrude toward the virtual surface VS to form a plurality of protrusions 21 and protrusions 22 respectively. Between two adjacent protrusions 21 (or between two adjacent protrusions 22) forms a guide channel. On one hand, protrusions 21 (22) reduce the distance between the bottom part B and the surface to be cleaned, leading a larger vacuum pressure in the relevant areas; on the other hand, guide channels 30 could avoid the vacuum pressure going too large, leading a smoother movement of the suction nozzle 100 on the surface to be cleaned. Besides, guide channels 30 could also guide dirt into the suction mouth 10 during the suction process.

[0044] Preferably, along the front and rear direction in FIG. 2, the nearer a guide channel 30 gets to the suction mouth 10, the smaller width it has. In this embodiment, when viewing along the direction perpendicular to the virtual surface VS, the protrusion 21 (22) has a proximately triangle shape, and the guide channel 30 has a flared shape.

[0045] Preferably, the width for the guide channel 30 is no less than 5 mm, or in other words, the distance between two adjacent protrusions 21 (or the distance between two adjacent protrusions 22) is no less than 5 mm.

[0046] Preferably, at the suction mouth 10, the guide

channel 30 has a smallest width d1, which is 5 mm-20 mm.

[0047] The protrusions 21 (22) extend to the edge of the suction mouth 10, or in other words, the protrusions 21 (22) connect with the edge of the suction mouth 10. At the edge of the suction mouth 10, the protrusions 21 are higher than the first slope 111, and the protrusions 22 are higher than the second slope 121. At the edge of the suction mouth 10, the distance L21 (or the distance L22) of the higher part is 0-2 mm, or preferably, the distance L21 (or the distance L22) is 0.5 mm-1 mm. Or in other words, at the edge of the suction mouth 10, the distance L21 from the part of the protrusions 21 furthest away from the first slope 111 to the first slope 111 is between 0.5 and 1 mm, and the distance L22 from the part of the protrusions 22 furthest away from the second slope 121 to the second slope 121 is between 0.5 and 1 mm. On the other hand, the existence of distance L21 and distance L22 means that the guide channels 30 at the position of suction mouth 10 have a clear structure, which is good for guiding dirt into suction mouth 10.

[0048] Preferably, in this embodiment, the first bottom face 11 also comprises a flat area 112. The protrusions 21 do not extend to the flat area 112, or in other words, in the flat area, no protrusions 21 are formed. The flat area 112 is adjacent to the first slope 111, and the flat area 112 locates at the edge of the bottom part B, or in other words, the flat area 112 is further away from the suction mouth 10 than the first slope 111.

[0049] Preferably, the flat area 112 is parallel to the virtual surface VS.

[0050] The flat area 112 has a bigger distance to the surface to be cleaned when compared to the first slope 111, which allows dirt, especially dirt of big size, to easily go underneath the bottom part B, leading to a better cleaning performance.

[0051] Preferably, the distance L3 between the flat area 112 and the virtual surface VS is 3 mm-20 mm, or more preferably, the distance L3 is 5 mm-15 mm.

[0052] The bottom part B is configured with one or more openings P, which allow the extension W to go through. In this embodiment, the bottom part B comprises four openings P, located at four corners of the bottom part B separately.

[0053] At surrounding of each opening P, the bottom part B is configured to form a second protrusion 40. Preferably, the height of the second protrusion 40 is the same as the height of the protrusion 21 (22).

[0054] Each second protrusion 40 comprises an outer protrusion 41 and an inner protrusion 42. The outer protrusion 41 locates at the side of the opening P back to the suction mouth 10. The outer protrusion 41 is configured with a guiding face which could guide dirt away from the opening P. In this embodiment, viewing along the direction perpendicular to the virtual surface VS, the outer protrusion 41 has an approximately triangle shape. The two surfaces where the two sides of the triangle locate form two guiding faces, leading to a difficult way for dirt getting close to the extension W extending the opening P. So, extensions W are not easily wrapped with hair, or not easily blocked with dust.

[0055] The rest of the second protrusion 40 is configured as the inner protrusion 42, which is connected with the outer protrusion 41 and extends to the suction mouth 10. The inner protrusion 42 partly surround the opening P, to protect the extension W inside the opening P.

[0056] Between the inner protrusion 42 and the opening P, the bottom part B is configured to form a concave part 50. The surface of the concave part 50 locates at approximately the same surface as the first slope 111 or the second slope 121 outside of the inner protrusion 42. The concave part 50 is interconnected with the suction mouth 10, allowing the dirt that temporary sticked on the extension W to go into the suction mouth 10 via the concave part 50.

[0057] Preferably, viewing along the direction perpendicular to the virtual surface VS, the concave part 50 has a flared shape. Along the front and rear direction in the figures, the closer to the suction mouth 10, the smaller width the concave part 50 is, which enhancing the guiding dirt function of the concave part 50.

[0058] It should be understood that, the present invention also provide a vacuum cleaner comprising the suction nozzle 100 described above.

[0059] The present invention has at least one of the following advantages:

(i) The distance between the surface to be cleaned and the parts on the bottom part B which facing the surface to be cleaned is appropriate, which ensures a good cleaning effect, as well as reducing the operation force of a user and saving energy.

(ii) The structure of protrusion 21 (22) and its size matching the first slope 111 and second slope 121 could easily guide dirt into suction mouth 10.

(iii) The extension W, especially the extension W with the shape of wheel, which used for contacting the surface to be contacted, defines a gap between the surface to be cleaned and the first bottom face 11 / the second bottom face 12. Besides, dirt is not easy to get stuck with the suction nozzle 100.

(iv) The second protrusion 40 also help to avoid or reduce the chance of dirt getting stuck on the extension W.

[0060] Although the present invention has been described in connection with the specified embodiments, it should not be construed as being in any way limited to the presented examples. The scope of the present invention is set out by the accompanying claim set. In the context of the claims, the terms "comprising" or "comprises" do not exclude other possible elements or steps. Also, the mentioning of references such as "a" or "an" etc. should not be construed as excluding a plurality. The use of reference signs in the claims with respect to elements indicated in the figures shall also not be construed

as limiting the scope of the invention. Furthermore, individual features mentioned in different claims, may possibly be advantageously combined, and the mentioning of these features in different claims does not exclude that a combination of features is not possible and advantageous.

Claims

1. A suction nozzle (100), the suction nozzle (100) comprising a bottom part (B) and a distance adjustment device (D), the bottom part (B) being configured to face a surface to be cleaned, the bottom part (B) comprising a suction mouth (10), a first bottom face (11) and a second bottom face (12), the first bottom face (11) and the second bottom face (12) being configured at two sides of the suction mouth (10) relatively, the distance adjustment device (D) being connected to the bottom part (B), wherein the position of the distance adjustment device (D) relative to the bottom part (B) being adjustable so that the distance from the suction mouth(10) and the surface to be cleaned being adjustable, wherein:

   the suction nozzle (100) being able to get contact with a flat surface to define a virtual surface (VS), at least part of the first bottom face (11) being inclined relative to the virtual surface (VS) to form a first slope (111), at least part of the second bottom face (12) being inclined relative to the virtual surface (VS) to form a second slope (121),
   a plurality of interval protrusions (21) being configured on the first slope (111) protruding towards the virtual surface (VS) and a plurality of interval protrusions (22) being configured on the second slope (121) protruding towards the virtual surface (VS), a guide channel (30) being generated between every two adjacent protrusions (21, 22),
   at every adjustment position of the distance adjustment device (D), the protrusions (20) being out of touch of the virtual surface (VS).

2. The suction nozzle (100) according to claim 1, wherein the protrusions (21, 22) extend to the edge of the suction mouth (10), and at the edge, the distance (L21) from the part of the protrusions (21) furthest away from the first slope (111) to the first slope (111) is between 0 and 2 mm, and the distance (L22) from the part of the protrusions (22) furthest away from the second slope (121) to the second slope (121) is between 0 and 2 mm, or more optimally,
   at the edge, the distance (L21) from the part of the protrusions (21) furthest away from the first slope (111) to the first slope (111) is between 0.5 and 1 mm, and the distance (L22) from the part of the protrusions (22) furthest away from the second slope (121) to the second slope (121) is between 0.5 and 1 mm.

3. The suction nozzle (100) according to claim 1 or 2, wherein the distance (L1) between the protrusions (21, 22) and the virtual surface (VS) is between 0.5 mm and 4 mm.

4. The suction nozzle (100) according to claim 3, wherein in a case when the suction nozzle is used to clean hard surface, the distance adjustment device (D) being at a first position, the distance (L1) between the protrusions (21, 22) and the virtual surface (VS) is between 0.5 mm and 3 mm, or more optimally, the distance between the protrusions (21, 22) and the virtual surface (VS) is between 1.5 mm and 2mm, and
   wherein in a case when the suction nozzle is used to clean carpet, the distance adjustment device (D) being at a second position, the distance (L1) between the protrusions (21, 22) and the virtual surface is between 1.5 mm and 4 mm, or more optimally, the distance between the protrusions (21, 22) and the virtual surface is between 2 mm and 3.5 mm.

5. The suction nozzle (100) according to any one of the claims 1 to 4, wherein the surface of the protrusions (21, 22) facing the virtual surface (VS) is parallel to the virtual surface (VS).

6. The suction nozzle (100) according to any one of the claims 1 to 5, wherein the first bottom face (11) further comprises a flat area (112) adjacent to the first slope (111), the flat area (112) being farther away from the suction mouth (10) than the first slope (111), the flat area (112) being configured with no said protrusions (21).

7. The suction nozzle (100) according to claim 6, wherein the distance (L3) between the flat area (112) and the virtual surface (VS) is between 3 mm and 20 mm, or more optimally, the distance (L3) between the flat area (112) and the virtual surface (VS) is between 5 mm and 15 mm.

8. The suction nozzle (100) according to any one of the claims 1 to 7, wherein the closer the position to the suction mouth (10) is, the narrower the guide channel (30) is.

9. The suction nozzle (100) according to claim 8, wherein at the position of the suction mouth (10), the width (d1) of the guide channel (30) is no less than 5 mm, or more optimally, wherein at the position of the suction mouth (10), the width (d1) of the guide channel (30) is between 5 mm and 20 mm.

10. The suction nozzle (100) according to any one of the claims 1 to 9, wherein the distance adjustment device (D) is configured with at least one extension (W), the bottom part (B) forming an opening (P), the extension (W) partly passing through the opening (P) and being used for getting contact with the virtual surface (VS).

11. The suction nozzle (100) according to claim 10, wherein the bottom part (B) at one side of the extension (W) facing away from the suction mouth (10) forms a second protrusion (40) protruding the first bottom face (11) or the second bottom face (12), the second protrusion (40) being formed with one or more guide surfaces configured to lead objects away from the extension (W).

12. The suction nozzle (100) according to claim 11, wherein part of the second protrusion (40) extends to a side of the extension (W) closer to the suction mouth (10), at the side of the extension (W) closer to the suction mouth (10) being formed with a concave part (50) partly surrounded by the second protrusion (40), the concave part (50) being interconnected with the suction mouth (10).

13. The suction nozzle (100) according to claim 12, wherein the concave part (50) is larger at one end than the other, the closer the position to the suction mouth (10), the smaller the width of the concave part (50).

14. The suction nozzle (100) according to any one of the claims 1 to 13, wherein between the first slope (111) and the virtual surface (VS) forms a first angle (α), and between the second slope (121) and the virtual surface (VS) forms a second angle (β), the first slope (111) being at the forward direction of the suction nozzle, the second slope (121) being at the backward direction of the suction nozzle, the first angle (α) being larger than or equal to the second angle (β).

15. The suction nozzle (100) according to claim 14, wherein the first angle (α) is between 15° and 45°, or more optimally, the first angle (α) is between 15° and 30°, and the second angle (β) is between 5° and 45°, or more optimally, the second angle (β) is between 5° and 30°.

16. A vacuum cleaner comprising a suction nozzle (100) according to any one of claims 1 to 15.

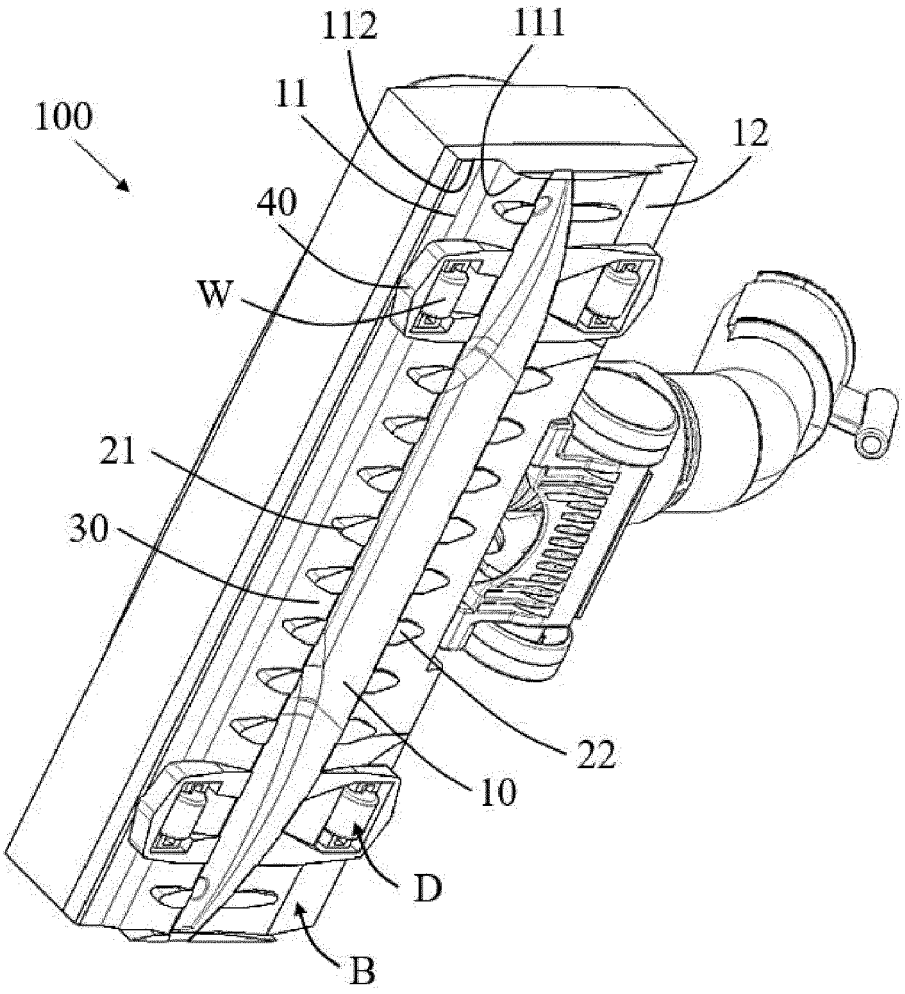

FIG. 1

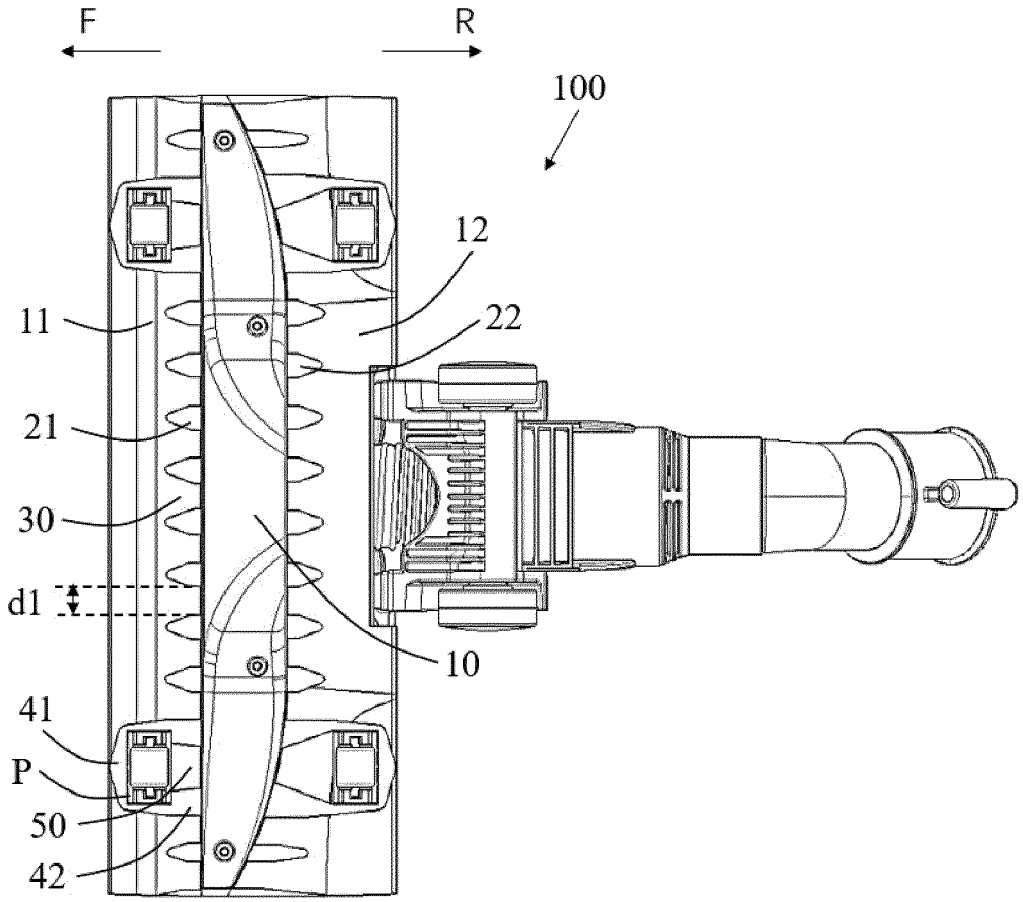

FIG. 2

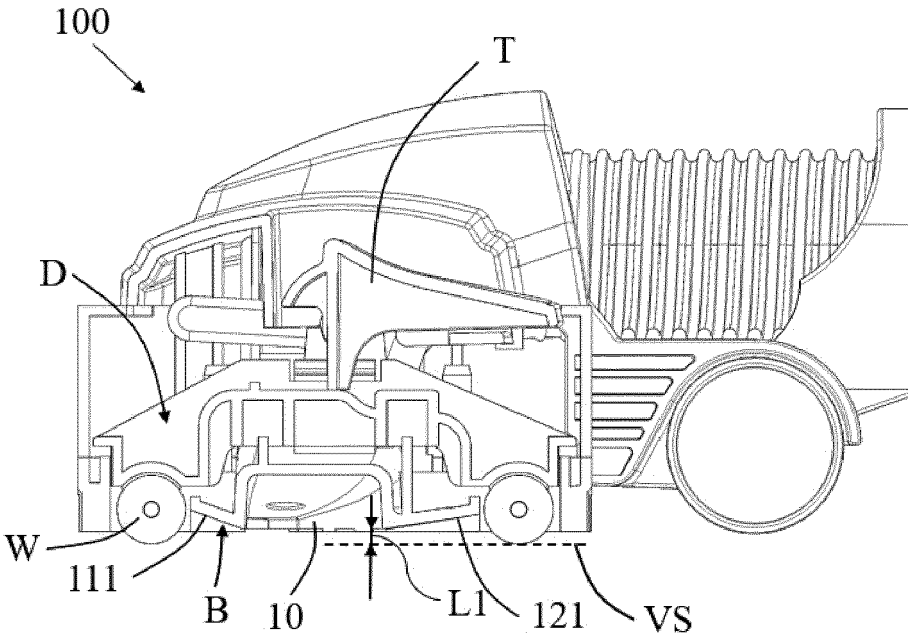

FIG. 3

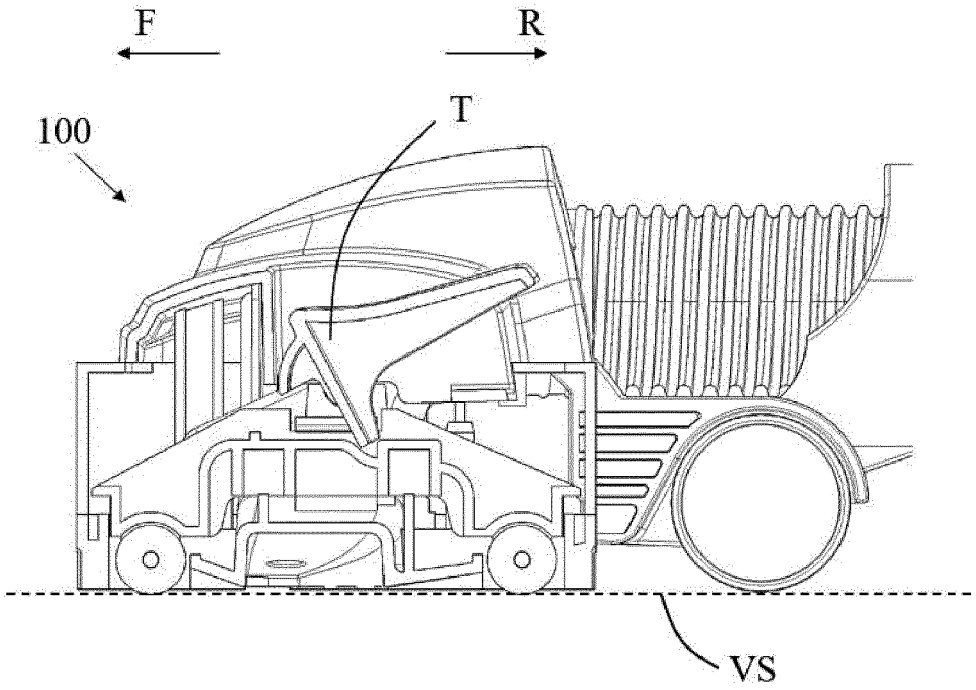

FIG. 4

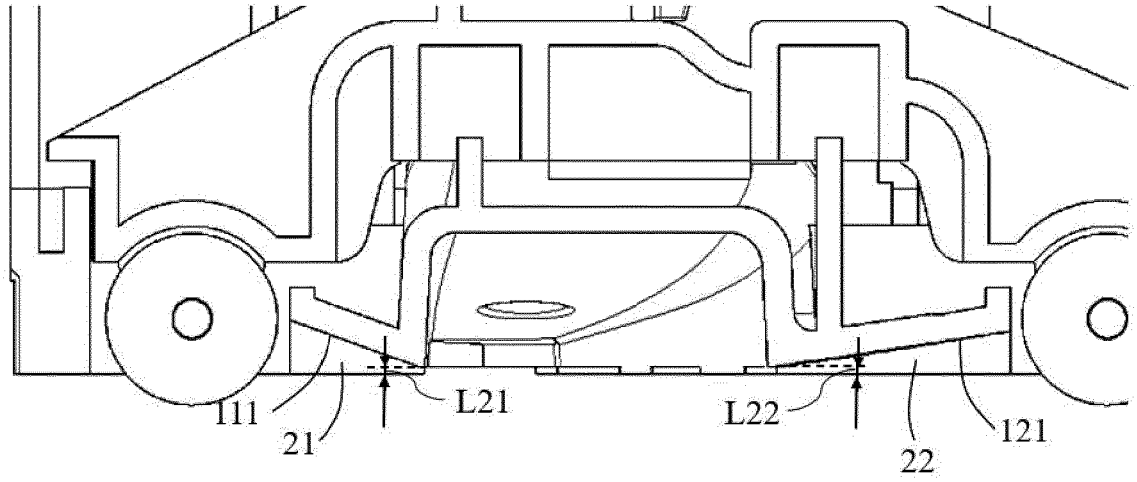

FIG. 5

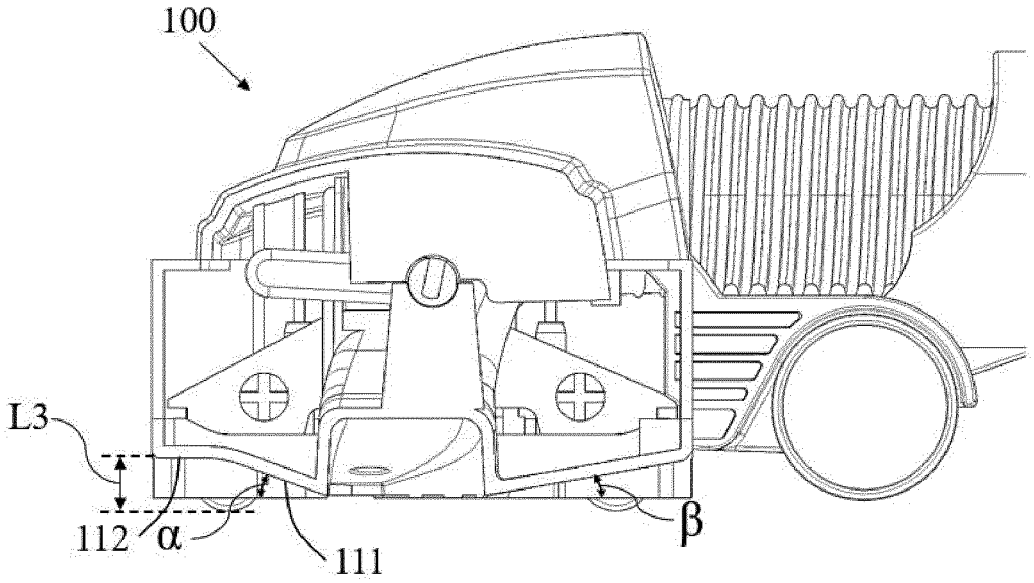

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
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Place of search	Date of completion of the search	Examiner
Munich	3 January 2023	Jezierski, Krzysztof

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