

(19)



(11)

EP 2 975 992 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

08.08.2018 Bulletin 2018/32

(51) Int Cl.:

A47L 9/06 (2006.01)

(86) International application number:

PCT/EP2013/063274

(21) Application number: **13731339.1**

(22) Date of filing: **25.06.2013**

(87) International publication number:

WO 2014/146730 (25.09.2014 Gazette 2014/39)

(54) VACUUM CLEANER NOZZLE WITH SEALING EDGE

SAUGMUNDSTÜCK FÜR STAUBSAUGER MIT ABDICHTUNGSKANTE

SUCEUR D'ASPIRATEUR AVEC BORD D'ETANCHÉITÉ

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(72) Inventor: **WADELIUS, Johan**

S-105 45 Stockholm (SE)

(30) Priority: **21.03.2013 SE 1300215**

(74) Representative: **Electrolux Group Patents**

AB Electrolux

Group Patents

105 45 Stockholm (SE)

(43) Date of publication of application:

27.01.2016 Bulletin 2016/04

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(73) Proprietor: **Aktiebolaget Electrolux**
105 45 Stockholm (SE)

JP-A- 2000 157 461

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Description

Field of the invention

[0001] The present invention generally relates to the field of vacuum cleaner nozzles having a sealing edge at the suction opening.

Background of the invention

[0002] Vacuum cleaner nozzles comprising multiple joints in the connection between the nozzle outlet and the extension tube and/or suction hose for increased performance on uneven and soft surfaces are known. The multiple joints allow the vacuum cleaner nozzle to adapt to the surface and thereby pick-up more dust as the hose and the vacuum cleaner nozzle is operated over a floor or a carpet. WO 02/26097 discloses a vacuum cleaner nozzle which is pivotally mounted with respect to a nozzle outlet, such that movement of the vacuum cleaner nozzle in a forward and backward direction alternately brings one of two working edges of the vacuum cleaner nozzle (or sealing edges which are arranged to restrict the air flow from areas surrounding the active suction area of the vacuum cleaner nozzle on soft surfaces) in closer contact with the surface being vacuumed. This is advantageous when vacuuming carpeted floors where hair, fluff and other fibrous material become trapped on the carpet. When utilizing vacuum cleaner nozzles according to the prior art solution as cited above, the movement forwards and backwards during vacuuming brings the vacuum cleaner nozzle to tilt. In the case of uneven surfaces and because of the movement, sudden drops of under pressure created by the suction under the vacuum cleaner nozzle can cause uncomfortable jumps. Furthermore, on some carpets, continued sudden drop and increase of under pressure causes the vacuum cleaner nozzle to vibrate in an annoying way. A nozzle alleviating these problems is disclosed in WO 2009/128763, wherein a portion of the duct wall forms an elongated first protrusion at the suction opening of the nozzle. The protrusion provides a first secondary sealing edge extending along at least a portion of a first primary sealing edge and is further horizontally displaced from the first primary sealing edge. The sealing edges are arranged for engaging with a surface being cleaned and for at least partly sealing the suction opening against the surface being cleaned.

[0003] The first secondary sealing edge decreases the size of under pressure drops that are created at the inlet side if the vacuum cleaner nozzle for some reason suddenly loses its close contact with the surface being cleaned (i.e. if the first primary sealing edge of the suction plate is suddenly tilted too far up from the surface). By arranging the air duct wall with the protrusion, the under pressure drop of the vacuum cleaner nozzle can be kept more controlled as the vacuum cleaner nozzle is moved across carpets or any textile or soft surface, and when the nozzle is tilted too much so that under pressure would

otherwise have dropped. If the under pressure is lost under the vacuum cleaner nozzle, the dust removal ability is temporary decreased, as the under pressure has to be built up again. The nozzle obtains a more controlled under pressure of the vacuum cleaner nozzle by allowing the under pressure to decrease in smaller steps as the first secondary sealing edge supports a less abrupt change in surface contact to the surface being cleaned. The annoying jumping effect and vibration effect in the vacuum cleaner nozzle due to sudden under pressure drops are then decreased. Thus, the secondary sealing edge provides better dust removal ability from carpets as well as a more comfortable cleaning experience.

[0004] The protrusion of the suction opening providing the first secondary sealing edge implies challenges in manufacturing of the suction plate, as the plastic moulding tool must be inserted from the top of the suction plate, which requires a rather large opening in the air duct of the suction plate. Alternatively, a separate part must be attached to the suction plate for forming the protrusion.

[0005] DE 103 01 113 A discloses a vacuum cleaner nozzle with improved thread pick-up features. The nozzle comprises thread pick-up modules swiveling around a pivot axis. Each module swivels outwards for the intake of fibers and swivels inwards for releasing the fibers. The thread pick-up is inclined towards the suction mouth opening, after an inwardly swivel movement of the thread pick-up module.

Summary of the invention

[0006] It would be advantageous to achieve a nozzle for a vacuum cleaner overcoming, or at least alleviating, the above mentioned drawback. In particular, it would be desirable to facilitate manufacturing of a nozzle for a vacuum cleaner.

[0007] To better address one or more of these concerns, a nozzle having the features defined in the independent claim is provided. Preferable embodiments are defined in the dependent claims.

[0008] According to an aspect, a nozzle for a vacuum cleaner is provided. The nozzle comprises a suction plate which comprises a suction opening for the purpose of taking in dust from a surface being cleaned, an outlet and an air duct extending through the suction plate from the suction opening to the outlet, the air duct having an end portion arranged to extend towards (such as up to) the suction opening in a direction being substantially vertical when the nozzle is in an operation position on the surface being cleaned. The suction plate further comprises a sealing edge arranged to engage with the surface being cleaned and to at least partially seal the suction opening against the surface being cleaned. The sealing edge extends along at least a portion of the suction opening, wherein a first portion of the sealing edge is arranged to be displaced in a natural (or normal) movement direction of the nozzle with respect to a second portion of the sealing edge. Further, the end portion of the air duct is ar-

ranged to be constantly flared and/or straight in the vertical direction towards and up to the first portion of the sealing edge and constantly flared and/or straight in the vertical direction towards and up to the second portion of the sealing edge.

[0009] In the present specification, vertical and horizontal directions are the directions which are vertical and horizontal, respectively, when the nozzle is positioned on a surface (such as a floor) to be (or being) cleaned, such as during normal operation of the nozzle. The horizontal plane may be equal to the plane in which the suction plate generally extends (i.e. a plane being substantially parallel with the surface to be cleaned). Hence, a horizontal direction may be any direction along the plane in which the suction plate generally extends. Further, a vertical direction may be a direction substantially perpendicular (or transverse) to the plane in which the suction plate generally extends.

[0010] The end portion of the air duct being arranged to be constantly flared and/or straight with respect to the vertical direction (or with respect to a direction perpendicular and/or transverse to the plane in which the suction plate generally extends) towards and up to the first portion of the sealing edge and towards and up to the second portion of the sealing edge, facilitates manufacturing of the suction plate. The vertical direction as defined in the present specification may be the same as the tooling direction, i.e. the direction in which a tool for moulding the shape of the end portion of the air duct is inserted and removed. By having a constantly flared and/or straight shape of the (substantially) vertical portion of the air duct for forming the (horizontally) displaced first and second portions of the sealing edge, the moulding tool may be inserted from the underside of the suction plate into the suction opening. In the prior art, the protrusion of the sealing edge (i.e. the displaced portion) is formed by the air duct being partially tapered in the vertical direction towards the sealing edge. Such tapered shape of the air duct necessitates that the moulding tool is inserted in the air duct from the upper side of the suction plate (to enable removal of the tool at the end of the moulding process), whereby a relatively large opening has to be provided in the air duct on the upper side of the suction plate. Subsequent to the moulding process, the opening must be sealed with a lid in order to make the air duct air tight. Such relatively large opening and lid may require rather complex fastening methods, such as welding, to reduce the risk of air leakage. With the present aspect, such opening may be smaller (or even omitted), whereby fastening of the lid may be facilitated. For example, the lid may be force fitted (press fitted) at the opening.

[0011] Further, the first and second portions of the sealing edge being displaced relative to each other in the natural movement direction of the nozzle provides similar benefits as the prior art nozzle shown in WO 2009/128763 and described above, i.e. improved dust removal ability from carpets as well as a more comfortable cleaning experience.

[0012] In the present specification, by the end portion of the air duct being "constantly flared and/or straight" it is meant that the end portion of the air duct does not have any portion being tapered in the vertical direction towards (and up to) the first and second portions of the sealing edge. Thus, the end portion of the air duct may be flared (i.e. divergent with respect to the vertical direction) and/or straight (i.e. substantially parallel with the vertical direction) at any given portion.

[0013] In an embodiment, the suction plate may be made of plastic. Preferably, the suction plate may be moulded in plastic. Plastic is a light weight and low cost material, thereby reducing the weight of the nozzle and manufacturing costs. The moulding operation is facilitated as the moulding tool may be inserted and removed from the underside of the suction plate.

[0014] In an embodiment, the first portion of the sealing edge may be positioned at a mid (or center) portion of the suction opening. The under pressure created between the vacuum cleaner nozzle and the surface being vacuumed may be larger at the mid portion of the suction plate. Thus, the positioning of the first portion of the sealing edge at the mid portion of the sealing edge is advantageous in that it allows for keeping a higher under pressure for the area covered by the suction plate overall.

[0015] In an embodiment, the end portion of the air duct is arranged to be more flared in (or with respect to) the vertical direction towards and up to the second portion of the sealing edge compared to in (or with respect to) the vertical direction towards and up to the first portion of the sealing edge so as to provide the displacement of the first portion of the sealing edge relative to the second portion of the sealing edge in the natural movement direction of the nozzle.

[0016] In an embodiment, the suction opening may be elongated, such as having a substantially rectangular shape, and the first portion of the sealing edge may be arranged at the centre of a long side of the elongated suction opening. The present embodiment is advantageous in that that the rectangular shape of the suction opening is better adapted for the normal operation of the vacuum cleaner nozzle during vacuuming, i.e. the forward and backward stroke of the vacuum cleaner nozzle in a direction being perpendicular to the longitudinal direction of the rectangular suction opening. The positioning of the first portion of the sealing edge at the centre of one of the long sides of the suction opening then provides for encountering a plurality of irregularities in the surface being vacuumed simultaneously, while still having the most advantageous positioning with respect to the distribution of the strength of the under pressure created beneath the suction plate.

[0017] In an embodiment, the first portion of the sealing edge may be displaced in the natural movement direction of the nozzle with respect to the second portion of the sealing edge by a distance corresponding to between 0.5 to 40 %, such as 0.5 to 10 %, of the width of the

suction opening. In this context, the width of the suction opening means the width of the suction opening in the natural movement direction of the nozzle.

[0018] In an embodiment, the sealing edge may be a first sealing edge and the suction plate may comprise a second sealing edge arranged opposite to the first sealing edge. With the present embodiment, the suction opening may be sealed both during the forward stroke and the backward stroke during cleaning. Further, the first portion of the second sealing edge may be arranged to be displaced in the natural movement direction of the nozzle with respect to a second portion of the second sealing edge, and the end portion of the air duct is arranged to be constantly flared (or divergent with respect to the vertical direction of the vertical portion of the air duct) and/or straight (i.e. parallel with the vertical direction of the vertical portion of the air duct) in a vertical direction towards and up to the first portion of the second sealing edge and constantly flared and/or straight in a vertical direction towards and up to the second portion of the second sealing edge. Hence, the second sealing edge may be similarly configured as the first sealing edge, thereby providing the same benefits as the first sealing edge at the opposite stroke during operation of the nozzle.

[0019] In an embodiment, the nozzle may further comprise at least one lint picker arranged at the suction plate along the first portion of the sealing edge, which facilitates picking up hair and fibres from soft surfaces, such as carpets.

[0020] In an embodiment, a vacuum cleaner is provided. The vacuum cleaner may comprise a nozzle according to any one of the preceding embodiments. According to an embodiment, the nozzle may be configured as the nozzle described in WO 2009/128763, except that the step provided by the protrusion forming the secondary sealing edge of the nozzle described in WO 2009/128763 is replaced by the second portion of the sealing edge according to the present aspect, whereby the vertical end portion of the air duct may be at least partly flared instead of tapered in order to form the step.

Brief description of the drawings

[0021] The above, as well as additional objects, features and advantages of the present aspect, will be better understood through the following illustrative and non-limiting detailed description of preferred embodiments, with reference to the appended drawings, in which:

Figure 1 shows a vacuum cleaner according to an embodiment;
 Figure 2 is an exploded view of a nozzle according to an embodiment;
 Figure 3 shows a suction plate of the nozzle shown in Figure 2;
 Figure 4 shows the underside of the suction plate shown in Figure 3;

Figure 5 is a cross-section of the nozzle shown in Figures 3 and 4 taken along line A-A;

Figure 6 is a cross-section of the nozzle shown in Figures 3 and 4 taken along line B-B;

Figure 7 is a cross-section of a suction plate of a prior art nozzle; and

Figure 8 is another cross-section of the suction plate of the prior art nozzle.

[0022] All the figures are schematic, not necessarily to scale, and generally only show parts which are necessary in order to elucidate the invention, wherein other parts may be omitted or merely suggested.

Detailed description of embodiments

[0023] Figure 1 shows a vacuum cleaner 100 comprising a nozzle 101 according to an embodiment. The nozzle 101 may be connected to a main body 104 of the vacuum cleaner 100 via a tube 102 and a hose 103.

[0024] A vacuum cleaner nozzle according to an embodiment will be described with reference to Figure 2. Figure 2 is an exploded view of a nozzle 1 comprising several rigid parts 7, 16, 17 interconnected to each other by one or more joints 14, 15 (or hinged connections). The nozzle 1 comprises a suction plate 7 connected to an intermediate part 16 via a hinged connection 14, whereby the suction plate 7 is arranged to pivot relative to the intermediate part 16. The nozzle 1 further comprises an outlet part 17 adapted to be (directly or indirectly) coupled to the hose of the vacuum cleaner and connected to the intermediate part 16 via a hinged connection 15. Thus, the three rigid parts 7, 16, 17 may be arranged to, at least slightly, pivot relative to each other in order to facilitate movement of the nozzle over uneven surfaces. An air duct is formed in the suction plate 7, the intermediate part 16 and the outlet part 17 for guiding air and dust from a surface being cleaned towards the hose of the vacuum cleaner.

[0025] The suction plate 7 will be described in more detail with reference to Figures 3 and 4. The suction plate 7 may be moulded, preferably as a single piece, in plastic. The suction plate 7 comprises a suction opening 2 and an outlet 4 for connection to the hose via the intermediate part 16 and the outlet part 17. An air duct is defined in the suction plate 7 extending from the suction opening 2 to the outlet 4 of the suction plate 7. The suction plate 7 comprises a first sealing edge 18 extending along at least a portion of the suction opening 2 and preferably also a second sealing edge 19 extending along another portion of the suction opening 2 and arranged opposite to the first sealing edge 18. The sealing edges 18, 19 are arranged to engage with a surface being cleaned during operation of the nozzle 1 and to at least partially seal the suction opening 2 against the surface being cleaned. In the present example, the suction plate 7 will tilt during forward movement of the nozzle 1 (as allowed by the pivotal connection between the suction plate 7 and the

intermediate part 16), whereby the first sealing edge 18 will engage with the surface being cleaned. When the nozzle 1 is moved backwards, the suction plate 7 will tilt in the opposite direction such that the second sealing edge 19 engages with the surface being cleaned. The tilting motion of the suction plate 7 occurs naturally during movement of the nozzle 1 back and forth in the natural (or normal) movement direction 20 of the nozzle 1. The suction opening 2 may preferably be elongated, and the first and second sealing edges 18, 19 may extend along the long sides of the suction opening 2. A first portion 5a of the first sealing edge 18 is displaced in the natural movement direction 20 of the nozzle 1 with respect to a second portion 6a of the first sealing edge 18. Similarly, a first portion 5b of the second sealing edge 19 may be displaced in the natural movement direction 20 of the nozzle 1 with respect to a second portion 6b of the second sealing edge 19. Thus, the suction opening 2 is (slightly) more narrow at the first portions 5a, 5b, of the first and second sealing edges 18, 19 than at the second portions 6a, 6b, of the first and second sealing edges 18, 19. Preferably, the first portions 5a, 5b, of the first and second sealing edges 18, 19 are arranged at a mid portion of the elongated suction opening 2. Further, the displacement of the first portions 5a, 5b relative to the second portions 6a, 6b may correspond to between 0.5 to 40 %, such as 0.5 to 10 %, of the width of the suction opening 2 (in the natural movement direction 20 of the nozzle 1). The nozzle 1 may further comprise lint pickers 21 arranged at the underside of the suction plate 7, such as along the first and second portions 5a, 5b of the first and second sealing edges 18, 19. The lint pickers 21 may comprise a strip of a material in which tufts of fine fibre are secured during cleaning. The lint pickers 21 may attract dust from the surface being cleaned, and the dust is further sucked in through the suction opening 2. When moving the nozzle 1 alternately forwards (away from the user) and backwards (towards the user), fibres are alternately picked up by, and peeled off from, the lint pickers 21.

[0026] Figures 5 and 6 show cross-sections of the suction plate 7 taken along lines A-A and B-B, respectively, in Figure 4. The air duct 12 comprises an end portion 3 extending in a direction 10 being (substantially) vertical when the nozzle is in a normal operation position (e.g. on a horizontal floor) up to the suction opening 2. The end portion 3 of the air duct 12 is constantly flared and/or straight with respect to the vertical direction 10 towards and up to the first portions 5a, 5b of the first and second sealing edges 18, 19, as illustrated in Figure 5. In the present example, the a part (the upper part) of the end portion 3 is straight and another part (the lower part) of the end portion 3 is slightly flared towards and up to the first portions 5a, 5b of the first and second sealing edges 18, 19. It can also be envisaged that the end portion 3 is merely flared or merely straight. The end portion 3 of the air duct 12 being flared means that the end portion 3 gets wider in direction towards the suction opening 2.

[0027] Further, the end portion 3 of the air duct 12 is

constantly flared and/or straight with respect to the vertical direction 10 towards and up to the second portions 6a, 6b of the first and second sealing edges 18, 19, as illustrated in Figure 6. In the present example, a part of the end portion 3 of is straight (or slightly flared and another part of the end portion 3 is (more) flared towards and up to the second portions 6a, 6b of the first and second sealing edges 18, 19. Preferably, the end portion 3 of the air duct 12 is more flared towards the second portions 6a, 6b, than towards the first portions 5a, 5b of the first and second sealing edges 18, 19, whereby the suction opening 2 is more narrow at the first portions 5a, 5b than at the second portions 6a, 6b of the first and second sealing edges 18, 19.

[0028] With the present configuration of the suction plate 7, the end portion 3 of the air duct 12 may be formed by inserting a moulding tool (or mould) in the vertical direction 10 from the underside of the suction plate 7, i.e. into the suction opening 2. As the end portion 3 of the air duct 12 is constantly flared and/or straight towards the suction opening 2, the moulding tool may be removed out of the suction opening 2 from the underside of the suction plate 7. Therefore, an opening 8 in the air duct 12 at the upper side of the suction plate 7 may optionally be omitted. However, such an opening 8 may be arranged in the air duct 12 in order to allow insertion of a moulding tool from the upper side of the suction plate 7 into the air duct 12 for forming a rounded corner portion 9 of the air duct 12, as illustrated in Figures 3 and 5. The size of the opening 8 may be limited to the size of the moulding tool for forming the rounded corner portion 9 and may therefore be rather small. As the opening 8 is rather small, it may be sealed with a lid 11 (shown in Figure 2) being press fitted into the opening 8.

[0029] Preferably, the end portion 3 may be constantly (at least slightly) flared towards the suction opening 2, thereby providing a relief angle, which facilitates removal of the moulding tool.

[0030] The displacement of the first portions 5a, 5b relative to the second portions 6a, 6b of the first and second sealing edges 18, 19, formed by the end portion 3 of the air duct being more flared towards the second portions 6a, 6b than towards the first portions 5a, 5b of the first and second sealing edges 18, 19, decreases the size of under pressure drops created at the inlet side if the vacuum cleaner nozzle for some reason suddenly loses its close contact with the surface being cleaned.

[0031] A suction plate of a vacuum cleaner nozzle according to prior art is illustrated in Figures 7 and 8 showing cross-sections of the prior art nozzle corresponding to the cross-sections illustrated in Figures 5 and 6. In the prior art, the displacements between the first portions 500 and the second portions 600 of the sealing edge of the suction opening are formed by the vertical end portion 300 of the air duct being tapered towards and up to the first portions 500 of the sealing edge and straight (or slightly flared) towards the second portions 600 of the sealing edge. In order to enable moulding of such a form

of the end portion 300 of the air duct, a large opening 800 is required in the air duct at the upper side of the suction plate 700 such that the moulding tool can be inserted in, and removed from, the air duct from above (i.e. the from the upper side of the suction plate 700). The large opening 800 may necessitate more complex fastening techniques than press fitting, such as welding, in order to make the air duct air tight.

[0032] While specific embodiments have been described, the skilled person will understand that various modifications and alterations are conceivable within the scope as defined in the appended claims.

Claims

1. A nozzle (1, 101) for a vacuum cleaner (100), the nozzle comprising a rigid suction plate (7) which comprises:

a suction opening (2) for the purpose of taking in dust from a surface being cleaned,

an outlet (4),
an air duct (12) extending through the suction plate from the suction opening to the outlet, the air duct having an end portion (3) arranged to extend towards the suction opening in a direction (10) being substantially vertical when the nozzle is in an operation position on the surface being cleaned, and

a sealing edge (18) arranged to engage with the surface being cleaned and to at least partially seal the suction opening against the surface being cleaned, the sealing edge extending along at least a portion of the suction opening, wherein a first portion (5a) of the sealing edge is arranged to be displaced in a natural movement direction (20) of the nozzle with respect to a second portion (6a) of the sealing edge, and wherein the end portion of the air duct is arranged to be constantly flared and/or straight in said vertical direction towards and up to the first portion of the sealing edge and constantly flared and/or straight in said vertical direction towards and up to the second portion of the sealing edge.

2. The nozzle as defined in claim 1, wherein the suction plate is made of plastic.
3. The nozzle as defined in claim 1 or 2, wherein the first portion of the sealing edge is positioned at a mid portion of the sealing edge.
4. The nozzle as defined in any one of the preceding claims, wherein the end portion of the air duct is arranged to be more flared in the vertical direction towards and up to the second portion of the sealing edge compared to in the vertical direction towards

and up to the first portion of the sealing edge.

5. The nozzle as defined in any one of the preceding claims, wherein the suction opening is elongated, and the first portion of the sealing edge is arranged at the centre of a long side of the elongated suction opening.
6. The nozzle as defined in any one of the preceding claims, wherein the first portion of the sealing edge is displaced in the natural movement direction of the nozzle with respect to the second portion of the sealing edge by a distance corresponding to between 0.5 to 40 %, such as 0.5 to 10 %, of the width of the suction opening.
7. The nozzle as defined in any one of the preceding claims, wherein the sealing edge is a first sealing edge (18) and the suction plate comprises a second sealing edge (19) arranged opposite to the first sealing edge.
8. The nozzle as defined in claim 7, wherein a first portion (5b) of the second sealing edge is arranged to be displaced in the natural movement direction of the nozzle with respect to a second portion (6b) of the second sealing edge, and wherein the end portion of the air duct is arranged to be constantly flared and/or straight in a vertical direction towards and up to the first portion of the second sealing edge and constantly flared and/or straight in a vertical direction towards and up to the second portion of the second sealing edge.
9. The nozzle as defined in any one of the preceding claims, further comprising at least one lint picker (21) arranged at the suction plate along the first portion of the sealing edge.
10. A vacuum cleaner (100) comprising a nozzle (1, 101) according to any one of the preceding claims.

Patentansprüche

1. Saugmundstück (1, 101) für einen Staubsauger (100), wobei das Saugmundstück eine starre Saugplatte (7) umfasst, die Folgendes umfasst:

eine Saugöffnung (2), um Staub von einer zu reinigenden Oberfläche aufzunehmen,
einen Auslass (4),
einen Luftkanal (12), der sich durch die Saugplatte von der Saugöffnung zum Auslass erstreckt, wobei der Luftkanal einen Endabschnitt (3) hat, der angeordnet ist, um sich hin zur Saugöffnung in einer im Wesentlichen vertikalen Richtung (10) zu erstrecken, wenn sich das

- Saugmundstück auf der zu reinigenden Oberfläche in einer Arbeitsstellung befindet, und eine Abdichtungskante (18), die angeordnet ist, um in die zu reinigende Oberfläche einzugreifen und die Saugöffnung mindestens teilweise gegenüber der zu reinigenden Oberfläche abzdichten, wobei sich die Abdichtungskante mindestens entlang einem Abschnitt der Saugöffnung erstreckt, wobei ein erster Abschnitt (5a) der Abdichtungskante so angeordnet ist, dass er in einer natürlichen Bewegungsrichtung (20) des Saugmundstücks im Verhältnis zu einem zweiten Abschnitt (6a) der Abdichtungskante versetzt ist, und wobei der Endabschnitt des Luftkanals so angeordnet ist, dass er in der vertikalen Richtung hin und nach oben zum ersten Abschnitt der Abdichtungskante konstant aufgeweitet ist und/oder gerade verläuft in der vertikalen Richtung hin und nach oben zum zweiten Abschnitt der Abdichtungskante konstant aufgeweitet ist und/oder gerade verläuft.
2. Saugmundstück nach Anspruch 1, wobei die Saugplatte aus Kunststoff hergestellt ist.
 3. Saugmundstück nach Anspruch 1 oder 2, wobei der erste Abschnitt der Abdichtungskante an einem Mittelabschnitt der Abdichtungskante positioniert ist.
 4. Saugmundstück nach einem der vorstehend aufgeführten Ansprüche, wobei der Endabschnitt des Luftkanals so angeordnet ist, dass er in der vertikalen Richtung hin und nach oben zum zweiten Abschnitt der Abdichtungskante im Vergleich zur vertikalen Richtung hin und nach oben zum ersten Abschnitt der Abdichtungskante aufgeweiteter ist.
 5. Saugmundstück nach einem der vorstehend aufgeführten Ansprüche, wobei die Saugöffnung länglich ausgebildet und der erste Abschnitt der Abdichtungskante am Zentrum einer langen Seite der länglichen Saugöffnung angeordnet ist.
 6. Saugmundstück nach einem der vorstehend aufgeführten Ansprüche, wobei der erste Abschnitt der Abdichtungskante in der natürlichen Bewegungsrichtung des Saugmundstücks im Verhältnis zum zweiten Abschnitt der Abdichtungskante um eine Distanz versetzt ist, die 0,5 bis 40%, beispielsweise 0,5 bis 10%, der Breite der Saugöffnung entspricht.
 7. Saugmundstück nach einem der vorstehend aufgeführten Ansprüche, wobei die Abdichtungskante eine erste Abdichtungskante (18) ist und die Saugplatte eine zweite Abdichtungskante (19) umfasst, die gegenüber der ersten Abdichtungskante angeordnet ist.
 8. Saugmundstück nach Anspruch 7, wobei ein erster Abschnitt (5b) der zweiten Abdichtungskante so angeordnet ist, dass er in der natürlichen Bewegungsrichtung des Saugmundstücks im Verhältnis zu einem zweiten Abschnitt (6b) der zweiten Abdichtungskante versetzt ist, und wobei der Endabschnitt des Luftkanals so angeordnet ist, dass er konstant aufgeweitet ausgebildet ist und/oder in einer vertikalen Richtung hin und nach oben zum ersten Abschnitt der zweiten Abdichtungskante gerade verläuft und in einer vertikalen Richtung hin und nach oben zum zweiten Abschnitt der zweiten Abdichtungskante konstant aufgeweitet ausgebildet ist und/oder gerade verläuft.
 9. Saugmundstück nach einem der vorstehend aufgeführten Ansprüche, das weiterhin mindestens einen Flusenleser (21) umfasst, der an der Saugplatte entlang dem ersten Abschnitt der Abdichtungskante angeordnet ist.
 10. Staubsauger (100), der ein Saugmundstück (1, 101) nach einem der vorstehend aufgeführten Ansprüche umfasst.

Revendications

1. Embout (1, 101) pour un aspirateur (100), l'embout comprenant une plaque d'aspiration rigide (7) qui comprend :
 - une ouverture d'aspiration (2) servant à collecter la poussière à partir d'une surface faisant l'objet d'un nettoyage,
 - une sortie (4),
 - un conduit à air (12) s'étendant à travers la plaque d'aspiration de l'ouverture d'aspiration à la sortie, le conduit à air comportant une partie d'extrémité (3) conçue pour s'étendre en direction de l'ouverture d'aspiration dans une direction (10) essentiellement verticale lorsque l'embout se trouve dans une position fonctionnelle sur la surface faisant l'objet d'un nettoyage, et
 - un bord d'étanchéité (18) conçu pour venir en contact avec la surface faisant l'objet d'un nettoyage et pour assurer une application au moins partiellement étanche de l'ouverture d'aspiration contre la surface faisant l'objet d'un nettoyage, le bord d'étanchéité s'étendant le long d'au moins une partie de l'ouverture d'aspiration, dans lequel une première partie (5a) du bord d'étanchéité est disposée de façon à être décalée dans une direction de déplacement naturel (20) de l'embout par rapport à une seconde partie (6a) du bord d'étanchéité, et
 - dans lequel la partie d'extrémité du conduit à air est conçue de façon à être constamment évasée

- et/ou droite dans ladite direction verticale en direction de la première partie du bord d'étanchéité et jusqu'à celle-ci et constamment évasée et/ou droite dans ladite direction verticale en direction de la seconde partie du bord d'étanchéité et jusqu'à celle-ci.
2. Embout selon la revendication 1, dans lequel la plaque d'aspiration est constituée de plastique. 10
 3. Embout selon la revendication 1 ou 2, dans lequel la première partie du bord d'étanchéité est positionnée au niveau d'une partie médiane du bord d'étanchéité. 15
 4. Embout selon l'une quelconque des revendications précédentes, dans lequel la partie d'extrémité du conduit à air est conçue de façon à être davantage évasée dans la direction verticale en direction de la seconde partie du bord d'étanchéité et jusqu'à celle-ci par comparaison avec son évasement dans la direction verticale en direction de la première partie du bord d'étanchéité et jusqu'à celle-ci. 20
 5. Embout selon l'une quelconque des revendications précédentes, dans lequel l'ouverture d'aspiration est allongée, et la première partie du bord d'étanchéité est disposée au niveau du centre d'un côté long de l'ouverture d'aspiration allongée. 25
 6. Embout selon l'une quelconque des revendications précédentes, dans lequel la première partie du bord d'étanchéité est décalée dans la direction de déplacement naturel de l'embout par rapport à la seconde partie du bord d'étanchéité d'une distance correspondant à une valeur de 0,5 à 40 %, par ex. 0,5 à 10 %, de la largeur de l'ouverture d'aspiration. 30
 7. Embout selon l'une quelconque des revendications précédentes, dans lequel le bord d'étanchéité est un premier bord d'étanchéité (18) et la plaque d'aspiration comprend un second bord d'étanchéité (19) disposé à l'opposé du premier bord d'étanchéité. 40
 8. Embout selon la revendication 7, dans lequel une première partie (5b) du second bord d'étanchéité est disposée de façon à être décalée dans la direction de déplacement naturel de l'embout par rapport à une seconde partie (6b) du second bord d'étanchéité, et 45
dans lequel la partie d'extrémité du conduit à air est conçue de façon à être constamment évasée et/ou droite dans une direction verticale en direction de la première partie du second bord d'étanchéité et jusqu'à celle-ci et constamment évasée et/ou droite 50
dans une direction verticale en direction de la seconde partie du second bord d'étanchéité et jusqu'à celle-ci. 55
 9. Embout selon l'une quelconque des revendications précédentes, comprenant en outre un élément de collecte de peluches (21) disposé au niveau de la plaque d'aspiration le long de la première partie du bord d'étanchéité.
 10. Aspirateur (100) comprenant un embout (1, 101) selon l'une quelconque des revendications précédentes.

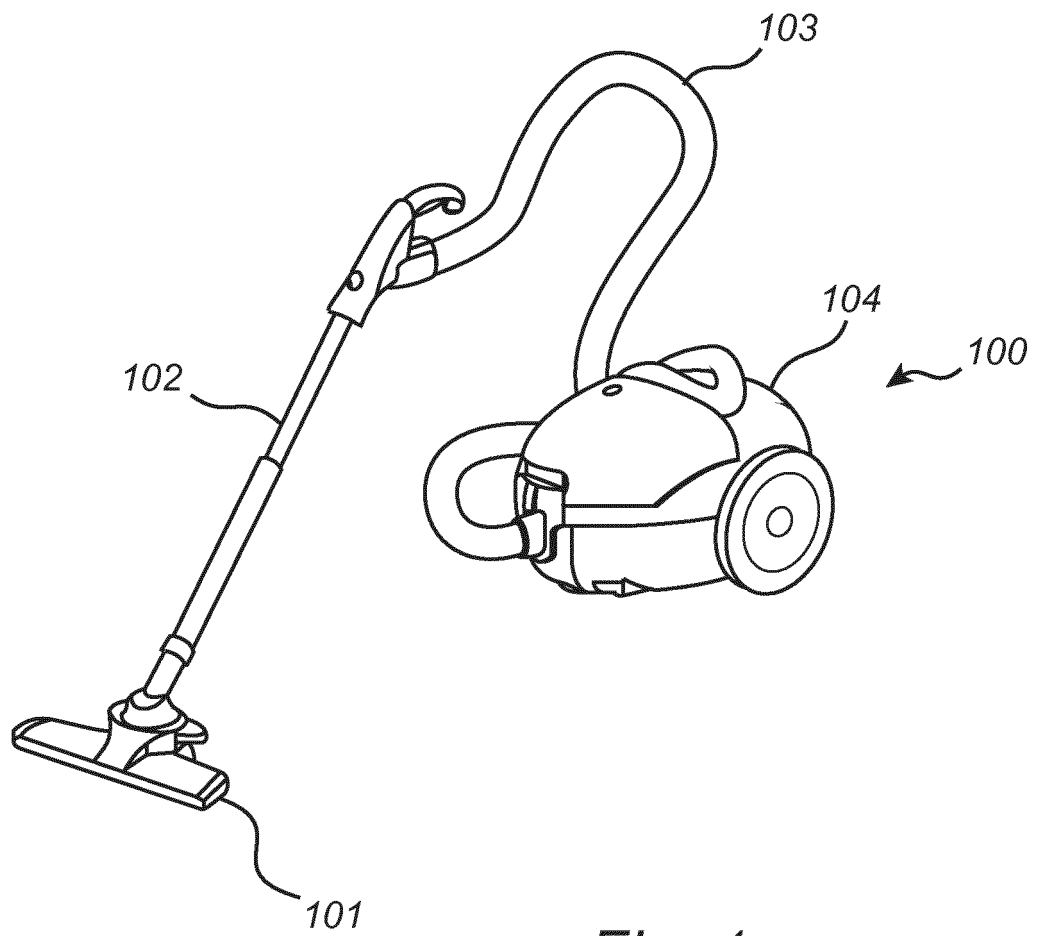


Fig. 1

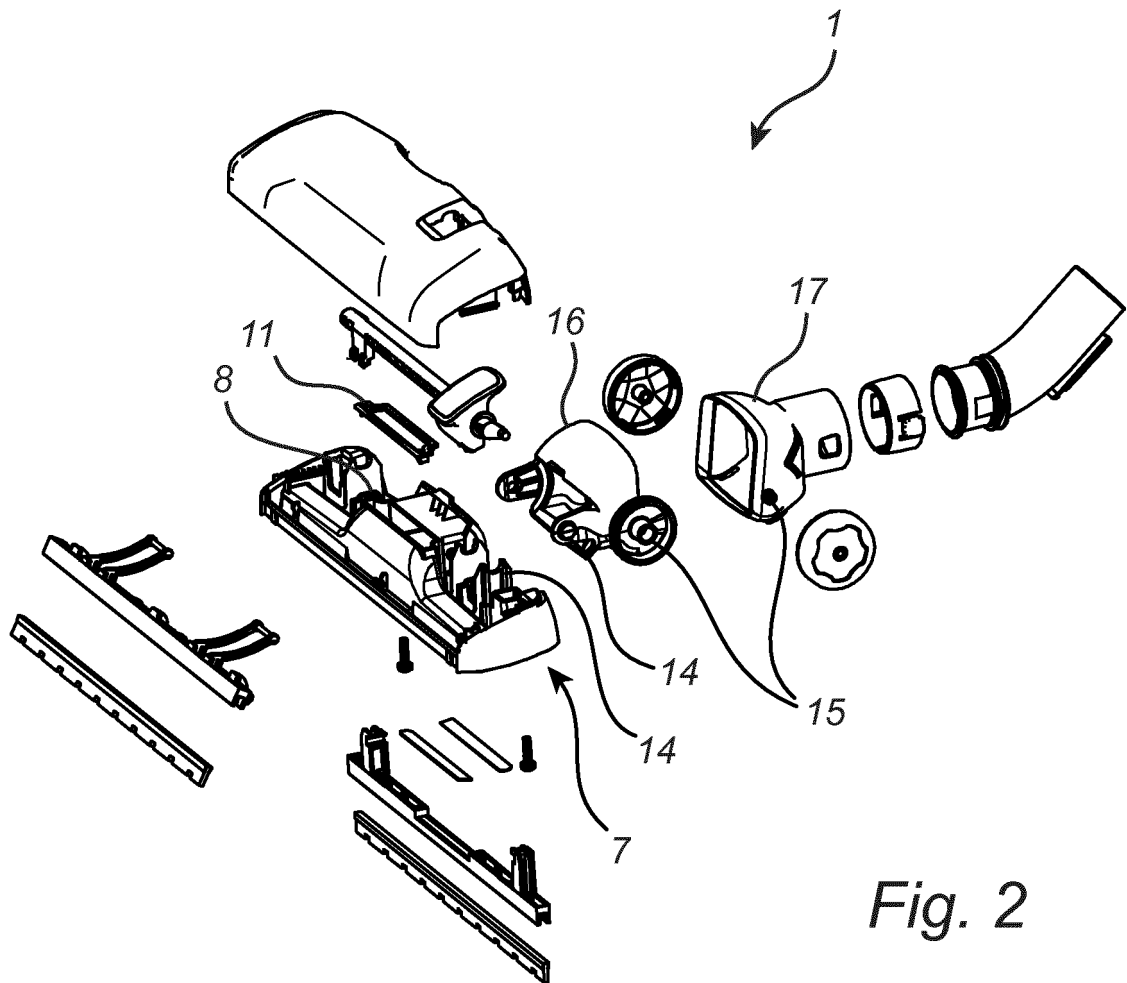


Fig. 2

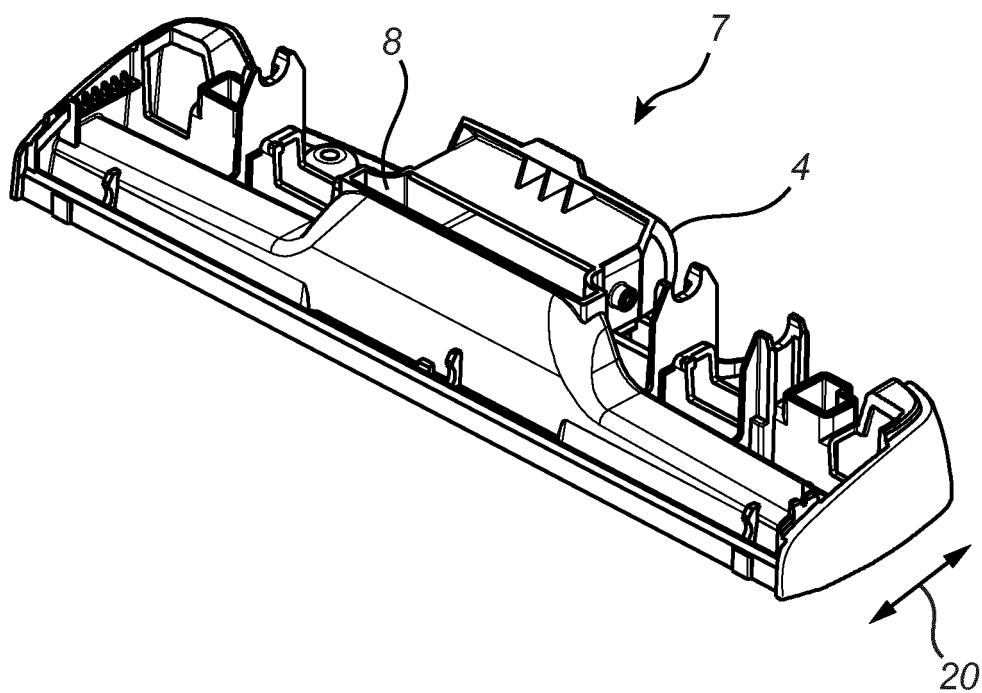


Fig. 3

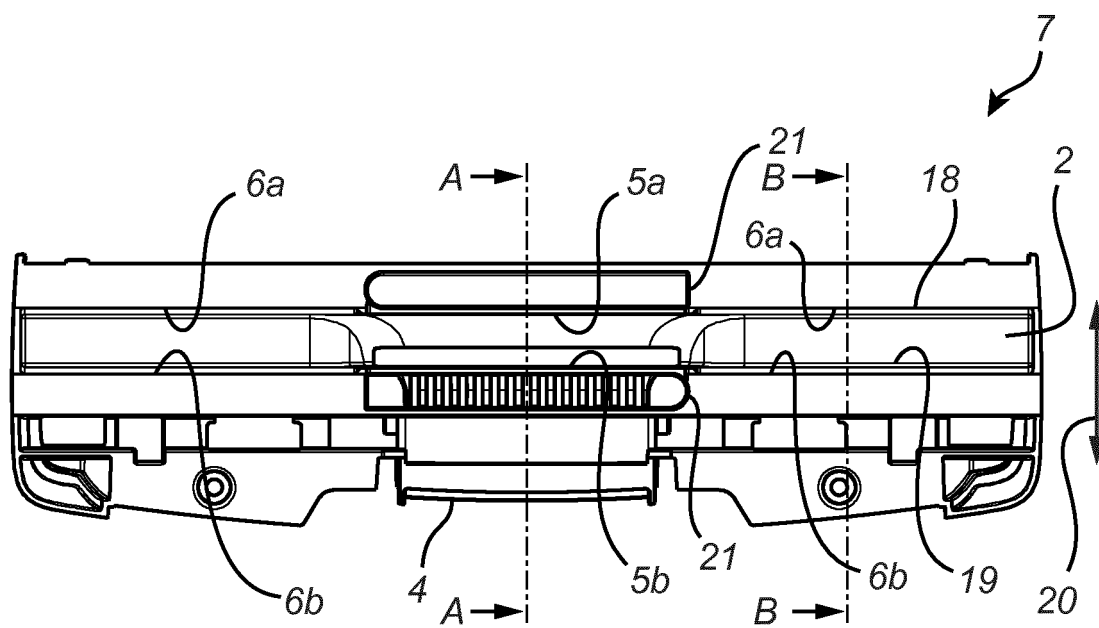


Fig. 4

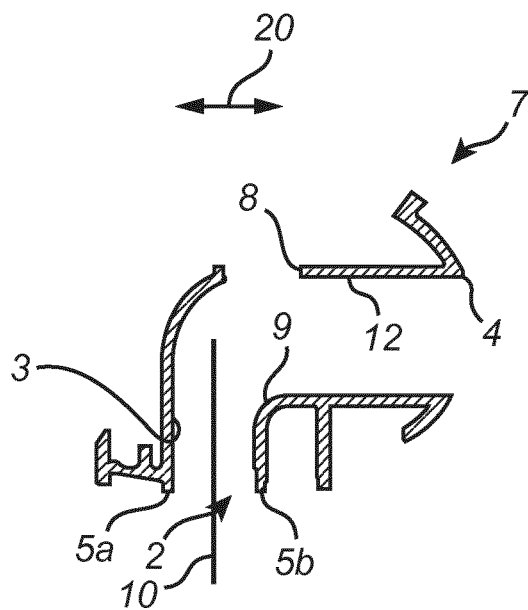


Fig. 5

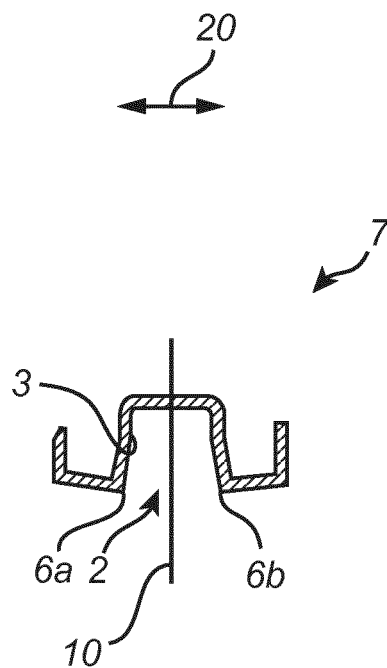


Fig. 6

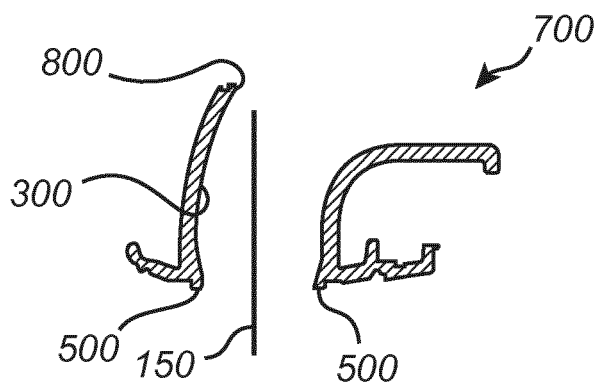


Fig. 7

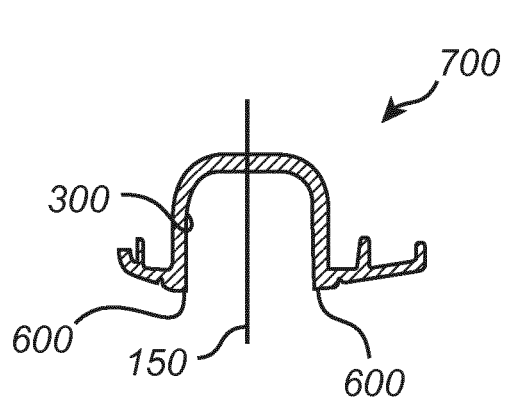


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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