

(19)



(11)

EP 3 763 270 B1

(12)

EUROPEAN PATENT SPECIFICATION

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

06.09.2023 Bulletin 2023/36

(51) International Patent Classification (IPC):

A47L 9/02 *(2006.01)*

(52) Cooperative Patent Classification (CPC):

A47L 9/02

(21) Application number: **19184912.4**

(22) Date of filing: **08.07.2019**

(54) **VACUUM CLEANER AND VACUUM CLEANER NOZZLE**

STAUBSAUGER UND STAUBSAUGERDÜSE

ASPIRATEUR ET BUSE POUR ASPIRATEUR

(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**

• **KARLSSON, Roger**

105 45 Stockholm (SE)

• **MIEFALK, Håkan**

105 45 Stockholm (SE)

(43) Date of publication of application:

13.01.2021 Bulletin 2021/02

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

AB Electrolux

Group Patents

S:t Göransgatan 143

105 45 Stockholm (SE)

(73) Proprietor: **Aktiebolaget Electrolux**

105 45 Stockholm (SE)

(72) Inventors:

• **DAHLBECK, Erik**

105 45 Stockholm (SE)

(56) References cited:

JP-A- 2003 153 834

JP-A- 2006 130 255

US-A- 6 101 668

EP 3 763 270 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Field of the invention

[0001] The present disclosure relates to a vacuum cleaner nozzle, comprising a connector tube, a floor interface forming a suction area corresponding to a surface to be cleaned under the nozzle, and an inner channel, connecting the suction area with the connector tube.

[0002] The present disclosure also relates to a vacuum cleaner comprising such a nozzle.

Technical background

[0003] Such a vacuum cleaner nozzle is shown for instance in DE-8116024-U. One general problem associated with nozzles of this type is how to increase their versatility in cleaning under varying conditions.

Summary of the invention

[0004] One object of the present disclosure is therefore to provide a vacuum cleaner nozzle that is more versatile.

[0005] Document US 6 101 668 A discloses a cleaner head for cleaning in a wet mode and a dry mode.

[0006] This object is achieved by means of a vacuum cleaner nozzle as defined in claim 1. More particularly, in a vacuum cleaner nozzle of the initially mentioned kind, there is provided a removable plate and means for optionally attaching the removable plate to a bottom side of the nozzle whereby the size of the suction area is changed. This provides the optional provision of a very concentrated cleaning action, for instance for deep cleaning of a rug or carpet, thereby making the vacuum cleaning nozzle more versatile. The removable plate may comprise an opening, preferably in the middle thereof, the plate surrounding an inlet to the inner channel when the plate is attached to the nozzle. Preferably, the width of this opening may be at least half the width of the nozzle. Thereby, a suitable cleaning width is provided.

[0007] The nozzle may comprise at least one wheel on said bottom side, the plate comprising a cut-out accommodating said at least one wheel.

[0008] The plate may be made in a plastic material, for instance by injection molding.

[0009] The nozzle may comprise a front and a rear brush, and the removable plate may be configured to be attached between the front and the rear brushes, which may be retractable.

[0010] The bottom surface of the removable plate may be inclined, such that the plate is thickest at its opening. This may enhance a deep cleaning effect in a rug as the edges at the opening apply some pressure on the rug during cleaning.

[0011] Typically, the suction area is reduced by attaching the removable plate to provide a stronger cleaning effect on a smaller area, although other options are possible.

[0012] The front and rear bottom faces of the removable plate may form a single, flat plane from a front edge to a rear edge of the removable plate.

[0013] Alternatively, front and/or rear bottom faces of the removable plate may be inclined to rise from the floor on which the nozzle is intended to rest, having their lowest points at the opening providing the above-mentioned deep cleaning effect.

[0014] In another alternative, the front and/or rear walls of the opening in the removable plate may be inclined such that their mutual distance tapers in a direction towards the bottom faces of the removable plate. This reduces the suction area.

[0015] In yet another alternative, the front and/or rear walls of the opening in the removable plate may be inclined such that their mutual distance tapers in a direction away from bottom faces of the removable plate. This may even increase the suction area compared to when no removable plate is attached, instead giving an optional more gentle cleaning effect.

[0016] The present disclosure also considers a vacuum cleaner comprising a nozzle as described above.

Brief description of the drawings

[0017]

Fig 1A shows a perspective view of an example of a vacuum cleaner nozzle, and fig 1B shows a schematic cross section through a nozzle being used to clean a floor.

Fig 2 shows schematically a removable plate for use under a vacuum cleaner nozzle.

Fig 3 shows the removable plate attached to a nozzle.

Fig 4 illustrates schematically a cross section through a nozzle as in fig 1B with an attached deep-cleaning plate.

Fig 5A and 5B illustrate examples of attachment arrangements for a removable plate.

Fig 6 shows a perspective view of an example of a part of a nozzle.

Fig 7A shows a cross section through the floor interface of the nozzle of fig 6.

Fig 7B shows a corresponding cross section through a removable plate.

Fig 7C shows a corresponding cross section where the plate of fig 7B is assembled with the nozzle portion of fig 7A.

Figs 8A-8D illustrate different removeable plate configurations.

Detailed description

[0018] The present disclosure relates generally to vacuum cleaner nozzles. Fig 1A shows one example of such a nozzle 1. The nozzle comprises a connector tube 3 that can be removably connected to a vacuum cleaner (not shown) although in the context of the present disclosure, the connector tube 3 may just as well be permanently connected to a vacuum cleaner.

[0019] The nozzle 1 further comprises an outer cover 5. Fig 1B illustrates, in schematic cross section, a nozzle 1 that is used to clean a surface, such as a floor 13. Inside the outer cover 5, there is formed a floor interface 6 that in some cases glide on the floor 13, especially on a soft floor such as a carpet. In other cases, typically on hard floors, brushes 15 (cf. fig 1A) may be extended from the nozzle, and the hard floor interface 6 may hover a small distance above the floor 13.

[0020] As illustrated in fig 1 B, the floor interface 6 may form, together with the floor 13 a suction space 7, where a reduced pressure is created in order to remove dust by means of an air stream leaking into the suction space 7. Thereby, a suction area 9 of the surface, under the suction space 7, is cleaned. Dust laden air is led from the suction space to the connector tube via an inner channel 11 of the nozzle 1.

[0021] Returning to fig 1A, the nozzle 1 may as mentioned comprise retractable brushes 15 (illustrated extended at a part of the nozzle periphery only) that may be retracted when cleaning soft surfaces such as carpets, and may be extended when cleaning hard surfaces, such as parquet or other wooden floors, in order to avoid scratching the surface to be cleaned. The retracting and extending of the brushes may be carried out by means of lever buttons 17 or other control means on the nozzle 1. The nozzle 1 may further comprise wheels that allow rolling the nozzle on a surface to be cleaned (not shown in fig 1A).

[0022] The use of retractable brushes thus makes it possible to optimize the nozzles function depending on the surface to be cleaned. The present disclosure relates to additional or alternative means for adapting the nozzle depending on use.

[0023] This is done by attaching a removeable plate on the bottom side of the nozzle. An example of such a removable plate 19 is shown in a front view in fig 2. The plate 19 may be made in a plastic material such as polypropylene, PP, or polyamide, PA, for instance, although other plastic materials or non-plastic materials, such as aluminum could be considered. If made in a plastic material, injection molding is a conceivable production method. The plate 19 may have a uniform thickness and may comprise an opening 21 in the middle thereof.

[0024] Fig 3 shows the removable plate 19 attached to the bottom side of a nozzle. When attached, the open-

ing 21 of the plate 19 surrounds the inlet to the nozzle's inner channel 11. The plate may be located between front and rear brush lines 15, 16 of the nozzle. As shown in fig 2, the plate may be provided with cut-outs 23 to accommodate wheels 25 of the nozzle 1. It is not necessary that the plate 19 surrounds the inlet to the channel 11, the plate could be for instance U-shaped.

[0025] The effect of the attached plate 19 is to reduce the suction area of the nozzle 1.

[0026] This is illustrated in fig 4 showing a schematic cross section corresponding to the one in fig 1B with an attached removeable plate 19 for deep-cleaning purposes. There is therefore obtained a reduced suction space 7' that cleans a reduced suction area 9' of the floor, formed by the opening 21 (cf. fig 2) in the removeable plate 19. This is typically used to deep-clean a thick rug where normal cleaning is not enough, and a more concentrated suction power is needed. The removable plate 19 is however not used during normal cleaning as the high suction force may cause the nozzle 1 to become less flexible to move around.

[0027] As shown in fig 3, the opening 21 of the removable plate 19 may be wider than half the width of the nozzle width as a whole such that efficient cleaning of a surface may still be carried out. By width is here meant the greatest width of the nozzle's bottom area, or the extension in a direction perpendicular to a direction in which the nozzle is adapted to be pushed or pulled, determined e.g. by the orientation of wheels, if any, and by the orientation of the connector tube in relation to the suction area.

[0028] The plate 19 should preferably be easily removed from and attached to the nozzle by a user. Fig 5A and 5B schematically illustrate examples of attachment arrangements for a removable plate 9. Fig 5A shows an example where a snap lock fitting is used, projections 27 on the plate 19 snapping into recesses 29 in the floor interface 6, or vice versa.

[0029] Fig 5B shows an alternative embodiment where no snap lock is used. Instead a permanent magnet 31 is located on the top of each projection 27 of the plate 19, and another magnet 31 is located in the bottom of a recess 29 in the floor interface 6. Thereby the plate 19 can be kept in place by inserting the projections 27 in the recesses 29. The location of the recess and projection may be swapped also in this embodiment, and either of the magnets 31 can be replaced by a ferromagnetic material, for instance.

[0030] As the plate is mainly subjected to forces directed in its plane only little retaining force is needed in the direction of the normal of the plane. The magnetic lock or snap fit need not carry much more than the plate's 19 own weight.

[0031] Other attachment means such as VELCRO are also conceivable in this context.

[0032] Fig 6 shows a perspective view of an example of a part of a nozzle 1 (e.g. the outer cover is not shown) as seen from the floor where there is formed a suction

space 7 between a front 15 and a rear 16 brush.

[0033] Fig 7A shows a cross section through the nozzle of fig 6 with brushes removed, and fig 7B shows a corresponding cross section through a removeable plate 19 that is configured to be attached to the nozzle 1 and has an upper surface that correspond to the lower surface of the nozzle where the plate is to be attached. In this case, the bottom surface of the removable plate 19 is inclined such that it is thickest at the opening 21. This may provide some pressure e.g. on a carpet under the nozzle, improving the cleaning function.

[0034] Fig 7C shows a corresponding cross section where the plate of fig 7B is assembled with the nozzle of fig 7A, now with brushes 15, 16.

[0035] It should be understood that the removeable plate 19 can be devised in different ways to obtain different cleaning effects. Figs 8A-8D illustrate different plate configurations. In general, the removeable plate 19 has a front 33 and a rear edge 35, as defined by the normal use of the nozzle. The removeable plate 19 further has a front 37 and a rear 39 bottom face, located in front of and behind the orifice or opening 21 of the plate. The opening further has front 41 and rear 43 walls rising from the plate bottom faces 37, 39, cf. also fig 7B.

[0036] Fig 8A illustrates a removeable plate 19 in a basic configuration where the front and rear bottom faces 37, 39 form a single, flat plane from the front 33 to the rear 35 edge. The front and rear walls 41, 43 rise vertically from this plane, and form right angle corners with the front and rear bottom face 37, 39, respectively.

[0037] Fig 8B illustrates an alternative version of the removeable plate 19 where, as compared to fig 8A, the front and rear bottom faces 37, 39 are inclined to rise from the floor on which the nozzle is intended to rest, having their lowest points at the opening 21. Differently worded, the bottom surface of the removable plate is inclined such that it is thickest at the opening. In any case, this forms acute angle corners between the front and rear walls 41, 43 of the opening 21 and the front and rear bottom face 37, 39, respectively. These acute corners may interfere with e.g. the structure of a thick carpet to a greater extent providing an improved deep-cleaning effect. This is similar the removeable plate 19 illustrated in fig 7B, although the corner angles are somewhat greater in that version.

[0038] Fig 8C shows another variation of the removeable plate 19 where, compared to fig 7B, the front and rear walls 41, 43 of the opening 21 are inclined such that their mutual distance tapers in the direction towards the bottom faces 37, 39. This means that the suction area 9 is reduced further, thereby providing an even greater cleaning effect.

[0039] Fig 8D shows yet another variation of the removeable plate 19 where, compared to fig 7B, the front and rear walls 41, 43 of the opening 21 are instead inclined such that their mutual distance tapers in the direction away from the bottom faces 37, 39. This makes it possible to allow a removeable plate 19 to even increase

the suction area 9, for instance to clean a sensitive material rug, or the like. Needless to say, a plurality of different removeable plates may be provided. The features illustrated in figs 8A-8D may be combined in different ways.

[0040] The present disclosure is not restricted to the above-described embodiment and may be varied and altered in different ways within the scope of the appended claims.

Claims

1. A vacuum cleaner nozzle (1), comprising a connector tube (3), a floor interface (6) forming a suction area (9) corresponding to a surface to be cleaned under the nozzle, and an inner channel (11), connecting the suction area (9) with the connector tube (3), a removable plate (19) and means for optionally attaching the removable plate to a bottom side of the nozzle whereby the size of the suction area (9) is changed, **characterized by** that the nozzle comprises a front (15) and a rear (16) brush, the removable plate (19) being configured to be attached between the front and the rear brush (15, 16).
2. A vacuum cleaner nozzle according to claim 1, wherein the removable plate (19) comprises an opening (21), preferably in the middle thereof, the plate surrounding an inlet to the inner channel (11) when the plate is attached to the nozzle.
3. A vacuum cleaner nozzle according to claim 1, wherein the width of the opening (21) is at least half the width of the nozzle (1).
4. A vacuum cleaner nozzle according to any of the preceding claims, wherein the nozzle comprises at least one wheel (25) on said bottom side, the plate (19) comprising a cut-out (23) accommodating said at least one wheel (25).
5. A vacuum cleaner nozzle according to claim, wherein the plate (19) is made in a plastic material.
6. A vacuum cleaner nozzle according to claim 1, wherein the front and the rear brush (15, 16) are retractable.
7. A vacuum cleaner nozzle according to claim 2, wherein the bottom surface of the removable plate (19) is inclined such that it is thickest at the opening (21).
8. A vacuum cleaner nozzle according to any of the preceding claims, wherein the suction area (9) is reduced by attaching the removeable plate (19).

9. A vacuum cleaner nozzle according to claim 2, wherein front and rear bottom faces (37, 39) of the removeable plate (19) form a single, flat plane from a front (33) to a rear (35) edge of the removeable plate (19). 5
10. A vacuum cleaner nozzle according to claim 2, wherein front and/or rear bottom faces (37, 39) of the removeable plate (19) are inclined to rise from the floor on which the nozzle is intended to rest, having their lowest points at the opening 21. 10
11. A vacuum cleaner nozzle according to claim 2, wherein front and/or rear walls (41, 43) of the opening (21) in the removeable plate (19) are inclined such that their mutual distance tapers in a direction towards bottom faces (37, 39) of the removeable plate (19). 15
12. A vacuum cleaner nozzle according to claim 2, wherein front and/or rear walls (41, 43) of the opening (21) in the removeable plate (19) are inclined such that their mutual distance tapers in a direction away from bottom faces (37, 39) of the removeable plate (19). 20
13. A vacuum cleaner comprising vacuum cleaner nozzle according to any of the preceding claims. 25

Patentansprüche

1. Staubsaugerdüse (1), umfassend ein Verbinderrohr (3), eine Fußbodenschnittstelle (6), die einen Saugbereich (9) entsprechend einer zu reinigenden Oberfläche unter der Düse bildet, und einen inneren Kanal (11), der den Saugbereich (9) mit dem Verbinderrohr (3) verbindet, eine abnehmbare Platte (19) und Mittel zum optionalen Befestigen der abnehmbaren Platte an einer Unterseite der Düse, wobei die Größe des Saugbereichs (9) geändert wird, **dadurch gekennzeichnet, dass** die Düse eine vordere (15) und eine hintere (16) Bürste umfasst, wobei die abnehmbare Platte (19) dazu ausgelegt ist, zwischen der vorderen und der hinteren Bürste (15, 16) befestigt zu werden. 35
2. Staubsaugerdüse nach Anspruch 1, wobei die abnehmbare Platte (19) eine Öffnung (21) umfasst, vorzugsweise in der Mitte davon, wobei die Platte einen Einlass zum inneren Kanal (11) umgibt, wenn die Platte an der Düse befestigt ist. 40
3. Staubsaugerdüse nach Anspruch 1, wobei die Breite der Öffnung (21) zumindest die halbe Breite der Düse (1) ist. 45
4. Staubsaugerdüse nach einem der vorhergehenden 50

Ansprüche, wobei die Düse zumindest ein Rad (25) an der Unterseite umfasst, wobei die Platte (19) einen Ausschnitt (23) umfasst, der das zumindest eine Rad (25) aufnimmt.

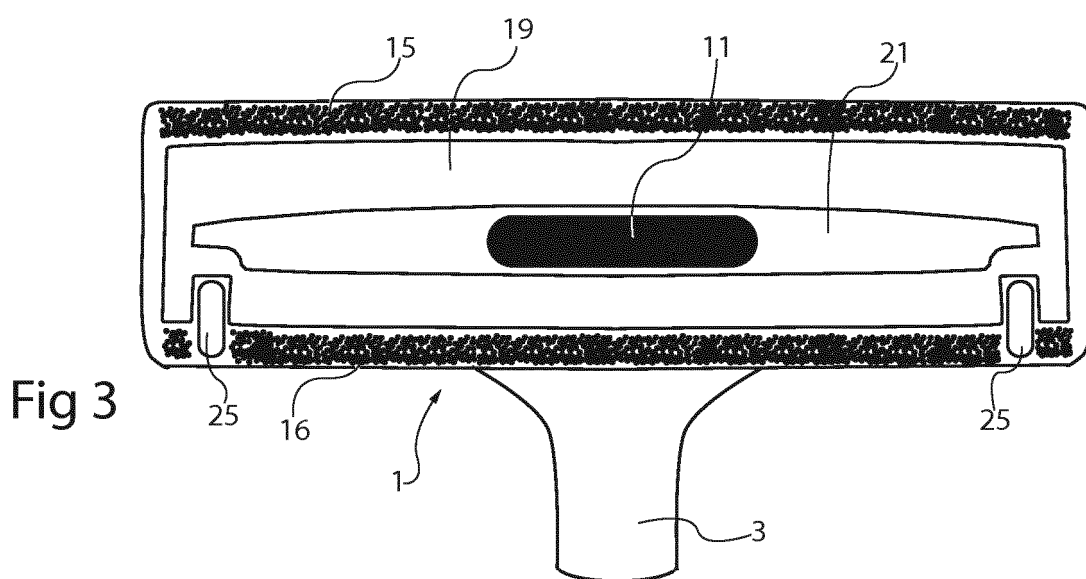
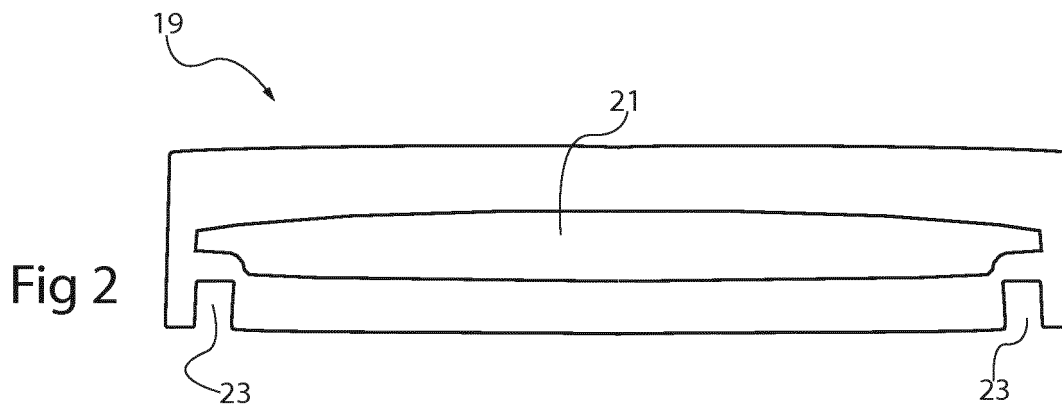
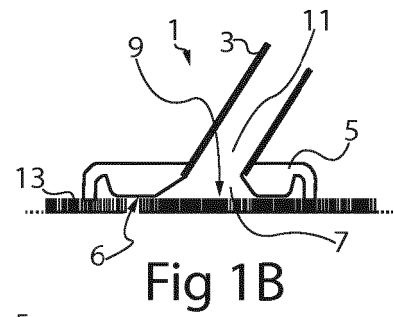
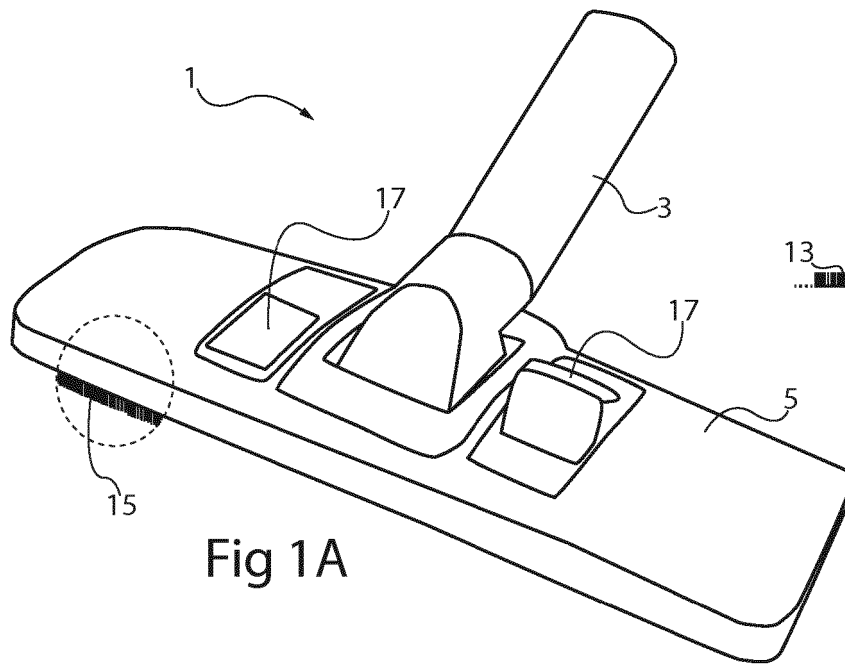
5. Staubsaugerdüse nach Anspruch, wobei die Platte (19) in einem Kunststoffmaterial gefertigt ist.
6. Staubsaugerdüse nach Anspruch 1, wobei die vordere und die hintere Bürste (15, 16) einziehbar sind.
7. Staubsaugerdüse nach Anspruch 2, wobei die untere Oberfläche der abnehmbaren Platte (19) geneigt ist, sodass sie an der Öffnung (21) am dicksten ist.
8. Staubsaugerdüse nach einem der vorhergehenden Ansprüche, wobei der Saugbereich (9) durch Befestigen der abnehmbaren Platte (19) verringert wird.
9. Staubsaugerdüse nach Anspruch 2, wobei vordere und hintere untere Flächen (37, 39) der abnehmbaren Platte (19) eine einzelne flache Ebene von einer vorderen (33) zu einer hinteren (35) Kante der abnehmbaren Platte (19) bilden. 25
10. Staubsaugerdüse nach Anspruch 2, wobei vordere und/oder hintere untere Flächen (37, 39) der abnehmbaren Platte (19) geneigt sind, um vom Fußboden, auf dem die Düse ruhen soll, aufzusteigen, wobei deren niedrigste Punkte an der Öffnung 21 sind. 30

11. Staubsaugerdüse nach Anspruch 2, wobei vordere und/oder hintere Wände (41, 43) der Öffnung (21) in der abnehmbaren Platte (19) geneigt sind, sodass sich ihr Abstand voneinander in einer Richtung hin zur unteren Fläche (37, 39) der abnehmbaren Platte (19) verjüngt. 35
12. Staubsaugerdüse nach Anspruch 2, wobei vordere und/oder hintere Wände (41, 43) der Öffnung (21) in der abnehmbaren Platte (19) geneigt sind, sodass sich ihr Abstand voneinander in einer Richtung weg von unteren Flächen (37, 39) der abnehmbaren Platte (19) verjüngt. 40
13. Staubsauger, umfassend eine Staubsaugerdüse nach einem der vorhergehenden Ansprüche. 45

Revendications

1. Buse d'aspirateur (1), comprenant un tube de raccordement (3), une interface de sol (6) formant une zone d'aspiration (9) correspondant à une surface à nettoyer sous la buse, et un canal intérieur (11), reliant la zone d'aspiration (9) au tube de raccordement (3), une plaque amovible (19) et des moyens pour 55

- fixer éventuellement la plaque amovible à un côté inférieur de la buse, la taille de la zone d'aspiration (9) étant ainsi modifiée, **caractérisée en ce que** la buse comprend une brosse avant (15) et une brosse arrière (16), la plaque amovible (19) étant configurée pour être fixée entre la brosse avant et la brosse arrière (15, 16).
2. Buse d'aspirateur selon la revendication 1, la plaque amovible (19) comprenant une ouverture (21), de préférence au milieu de celle-ci, la plaque entourant une entrée dans le canal intérieur (11) lorsque la plaque est fixée à la buse. 10
 3. Buse d'aspirateur selon la revendication 1, la largeur de l'ouverture (21) étant au moins égale à la moitié de la largeur de la buse (1). 15
 4. Buse d'aspirateur selon l'une quelconque des revendications précédentes, la buse comprenant au moins une roue (25) sur ladite face inférieure, la plaque (19) comprenant une découpe (23) accueillant ladite au moins une roue (25). 20
 5. Buse d'aspirateur selon la revendication, la plaque (19) étant fabriquée en matière plastique. 25
 6. Buse d'aspirateur selon la revendication 1, les brosses avant et arrière (15, 16) étant rétractables. 30
 7. Buse d'aspirateur selon la revendication 2, la surface inférieure de la plaque amovible (19) étant inclinée de telle sorte qu'elle est la plus épaisse au niveau de l'ouverture (21). 35
 8. Buse d'aspirateur selon l'une quelconque des revendications précédentes, la surface d'aspiration (9) étant réduite par la fixation de la plaque amovible (19). 40
 9. Buse d'aspirateur selon la revendication 2, les faces inférieures avant et arrière (37, 39) de la plaque amovible (19) formant un plan unique et plat d'un bord avant (33) à un bord arrière (35) de la plaque amovible (19). 45
 10. Buse d'aspirateur selon la revendication 2, les faces inférieures avant et/ou arrière (37, 39) de la plaque amovible (19) étant inclinées pour s'élever par rapport au sol sur lequel la buse est destinée à reposer, leur point le plus bas se situant au niveau de l'ouverture 21. 50
 11. Buse d'aspirateur selon la revendication 2, les parois avant et/ou arrière (41, 43) de l'ouverture (21) de la plaque amovible (19) étant inclinées de telle sorte que leur distance mutuelle diminue en direction des faces inférieures (37, 39) de la plaque amovible (19). 55
 12. Buse d'aspirateur selon la revendication 2, les parois avant et/ou arrière (41, 43) de l'ouverture (21) de la plaque amovible (19) étant inclinées de telle sorte que leur distance mutuelle diminue dans une direction opposée aux faces inférieures (37, 39) de la plaque amovible (19).
 13. Aspirateur comprenant une buse d'aspirateur selon l'une quelconque des revendications précédentes.



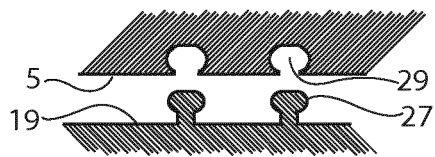
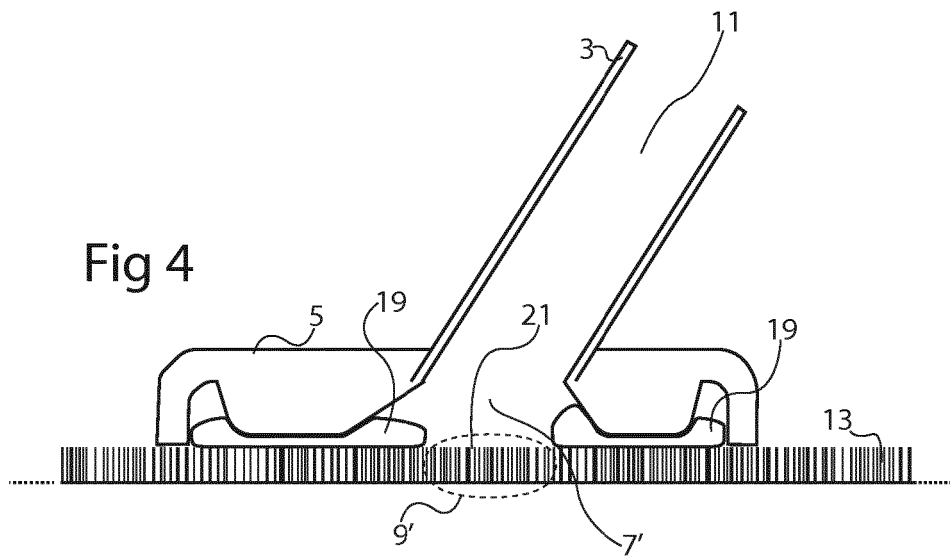


Fig 5A

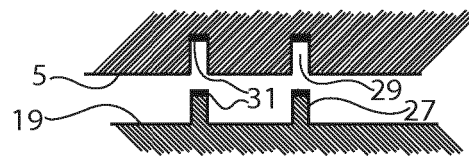
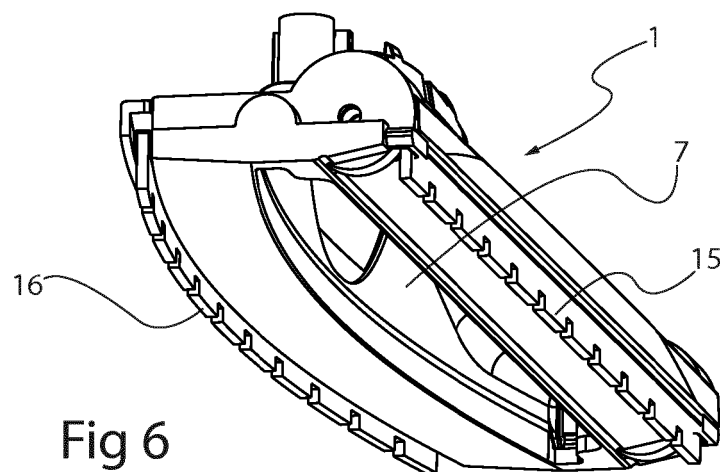
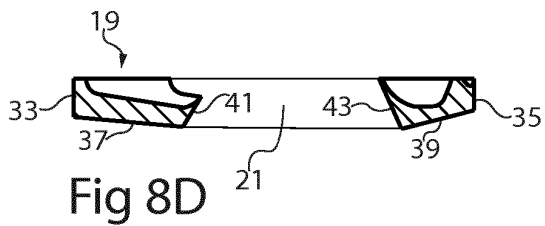
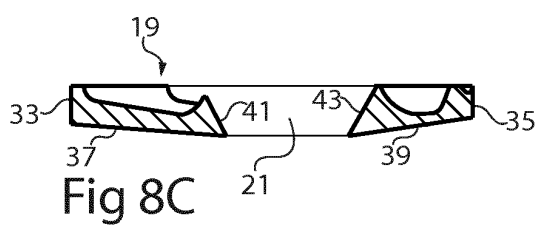
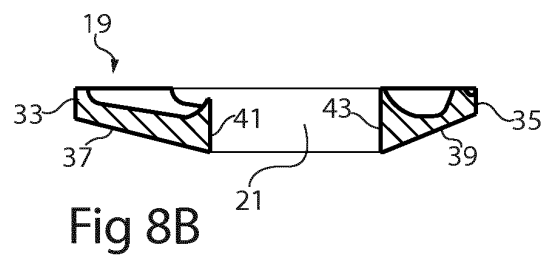
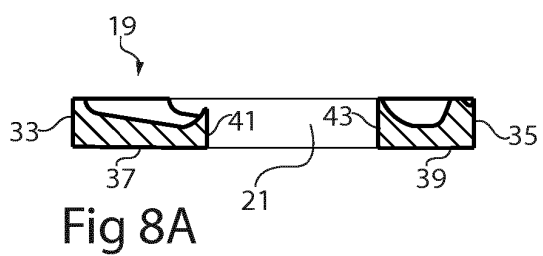
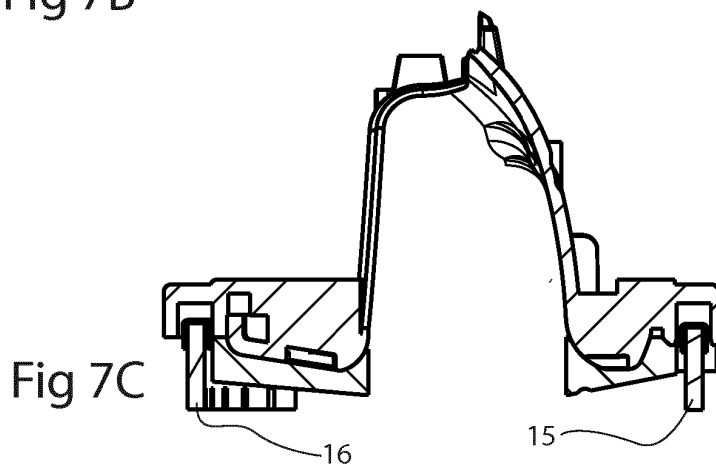
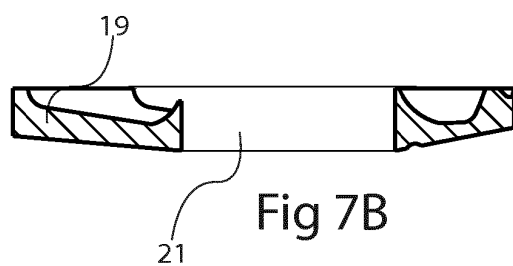
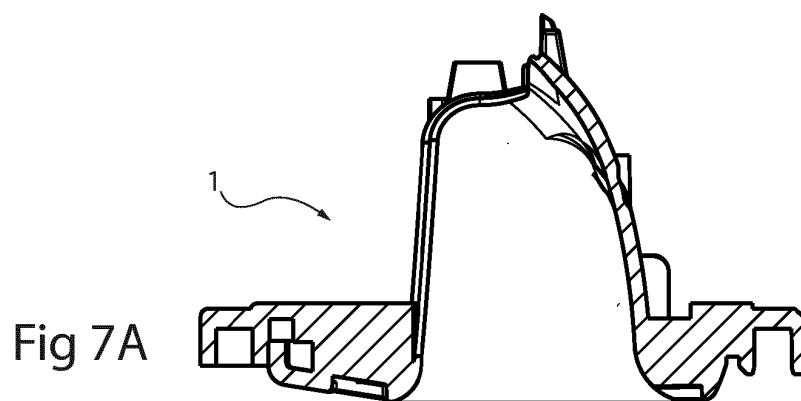


Fig 5B





REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 8116024 U [0003]
- US 6101668 A [0005]