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(54) **ACCESSORY FOR A VACUUM CLEANER SUCTION HEAD FOR COLLECTING LARGE DEBRIS**

(57) An accessory for a suction head for a vacuum cleaner is described, the accessory comprising engaging means configured for removably connecting the accessory to the suction head along its base plate, wherein the accessory comprises a main body with a lower surface which, during use, is directed towards the surface to be vacuumed, and a top face comprising the engaging means, wherein the main body comprises a transverse slot configured to be situated opposite the mouth of a base plate channel of the suction head when the accessory is connected to the suction head; and wherein the main body comprises spacer members for spacing, during use, the lower face of the main body from the surface to be vacuumed.

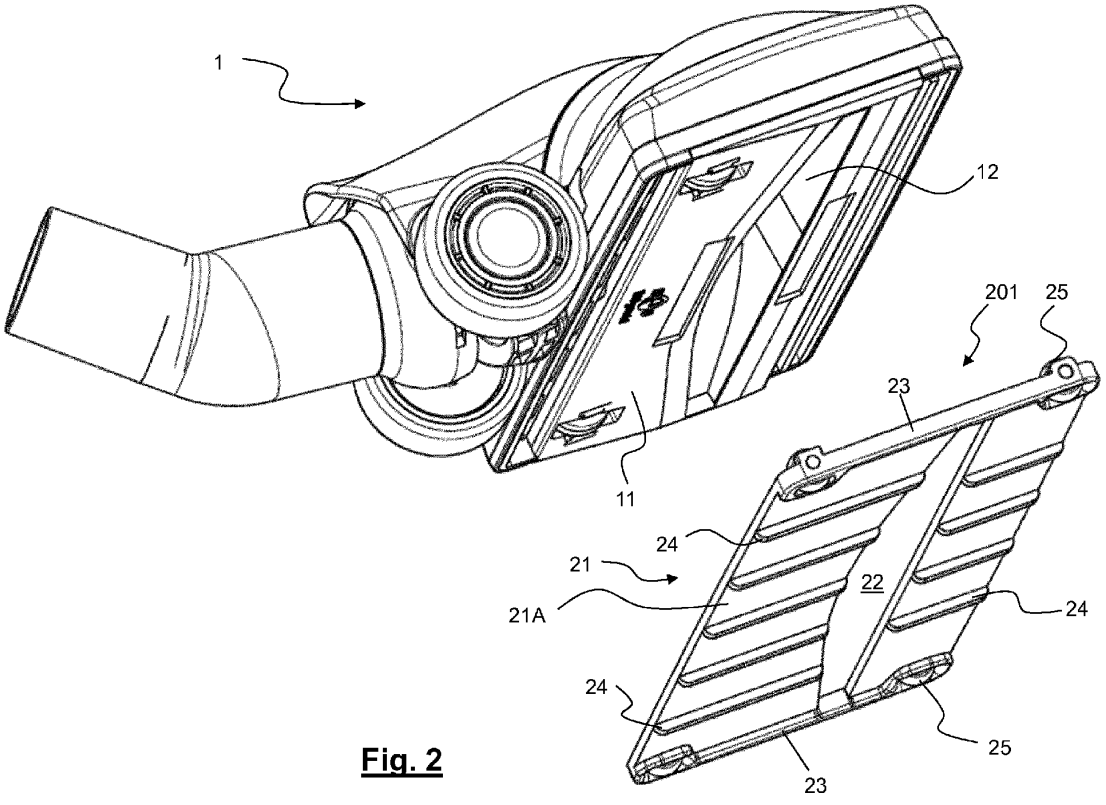

Fig. 2

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Description

BACKGROUND

[0001] The present invention relates to the sector of electric household appliances for performing cleaning by means of suction, such as a vacuum cleaner, an electric broom or a multi-purpose vacuum cleaner drum, for sucking up dust and/or fluids and/or debris from a surface. More particularly, it relates to an accessory for a suction head to be fitted to such an electric household appliance configured to vacuum large-size debris from a surface. It also relates to a suction head with an accessory mounted removably thereon.

BACKGROUND ART

[0002] For the purposes of the present invention, the expression "large debris", "large-size body" or "large-size material" (or similar expressions) is understood as meaning a body with a size generally larger than that of a particle of dust or a grain of sand. Such a large-size body may be a grain of rice, a lentil, a bread crumb, a paper clip, a metal staple of a stapler, a piece of cardboard, a fragment of glass or ceramic, a piece of a toy (such as Lego® nanoblock), etc. A large-size body may also be an assembly of bodies which are same as each other or different from each other. For example a tuft of animal and/or human hair and/or dust.

[0003] The relevant dimension for classifying a body as large-size debris for the purposes of the present invention is the height of the body when located on the surface to be vacuumed. This relevant dimension is therefore not necessarily the maximum dimension of the said body. For example, the relevant dimension of an elongate body (such as a grain of rice) is the diameter in its central part and not the total length of the grain. In the case of paper staples, the relevant dimension is essentially the diameter of the wire or in any case the thickness of the staple when it is lying on a surface to be cleaned.

[0004] For the purposes of the present invention, a large-size body has a relevant dimension greater than or equal to 1 mm. Preferably the relevant dimension is greater than or equal to 2 mm. Preferably the relevant dimension is not greater than 5 mm, more preferably not greater than 4 mm.

[0005] As is known, a vacuum cleaner, an electric broom or a similar electric household appliance for performing cleaning by means of suction comprises a suction head for sucking up dust, debris or fluids from a surface. In the sector of electric household appliances, a suction head is generally referred to by the term "brush". For the purpose of the present description, therefore, the terms "suction head" and "brush" are considered to be equivalent. Again for the purpose of the present invention, the term "vacuum cleaner" will be used with a broad meaning so as to include all those apparatus, for professional or domestic use, which perform cleaning by means of suction. Therefore, the term "vacuum cleaner" will comprise a vacuum cleaner, an electric broom, a so-called multi-purpose vacuum cleaner drum, a centralized suction system for domestic or industrial use and a steam supply and suction apparatus.

[0006] Basically a known suction head comprises a base plate shaped so as to have at least one base plate channel open towards a surface to be vacuumed, a suction channel which, during use, is joined to the base plate and is in fluid communication with the base plate channel and optionally a covering body which can be connected to the base plate-suction channel assembly. The other end of the suction channel communicates with a suction tube usually via a rotatable joint. Suction heads are also known in which the suction channel, during use, is formed together with the covering body.

[0007] In order to avoid an incorrect interpretation of certain expressions which will be frequently used during the course of the present description and in the claims, a number of definitions are provided hereinbelow. These definitions will also be used further below with specific reference to the figures.

- the expression "width" of a suction head, will be understood as meaning the maximum dimension (or footprint) of a suction head without the covering body and calculated substantially parallel to a longitudinal axis of the base plate channel;
- the expression "suction efficiency" will be understood as meaning essentially the ratio, in percentage terms, of the vacuumed material to the material to be vacuumed. The vacuuming tests are carried out in accordance with the provisions of the standard EN 60312-1:2013 and later versions.

SUMMARY OF THE INVENTION

[0008] Although different suction heads which perform the function of sucking dust and/or fluids and/or debris from a surface in a sufficiently efficient manner are available on the market, the Applicant has noticed that there exists the need to improve the performance of the known suction heads. In particular, the Applicant has noticed that there exists the need to improve the capacity to suck up large-size bodies and debris on hard and substantially smooth surfaces such as marble, cement, resin, tiled, parquet or similar floors and also suck up dust from a crevice, such as the joints between floor tiles.

[0009] The problem is that generally a vacuum cleaner is designed to clean both hard surfaces and also carpets, rugs, mats, doormats or other pile surfaces.

[0010] Therefore, a conventional suction head supplied with a vacuum cleaner generally represents a compromise in terms of suction efficiency on the various types of surface.

[0011] The Applicant has defined the object of improving substantially the suction efficiency of a conventional suction head as regards the suction of large-size debris,

in particular (but not only) on substantially smooth and compact surfaces, without modifying substantially the suction characteristics of the suction head on other types of surfaces.

[0012] According to the Applicant, the aforementioned object, together with others, may be achieved with an accessory which can be removably coupled with a suction head, the accessory comprising a main body with a top face configured to be coupled with the suction head and a lower face directed towards the surface to be vacuumed when in use. The main body has a transverse elongated slot configured to be situated opposite the mouth of the base plate channel of the suction head. The accessory also comprises a spacer member for spacing, during use, the lower face from the surface to be vacuumed. The spacer member may comprise one or more ribs. As an alternative to or in combination with the ribs, downwardly projecting roller wheels may be provided.

[0013] According to a first aspect, the present invention provides an accessory for a suction head for a vacuum cleaner, the accessory comprising engaging means configured for removably connecting the accessory to the suction head along its base plate,

wherein said accessory comprises a main body having a lower face which, during use, is directed towards the surface to be vacuumed, and a top face comprising said engaging means,

wherein said main body comprises a transverse slot configured to be situated opposite the mouth of a channel of the base plate of the suction head when said accessory is connected to said suction head; and

wherein said main body comprises spacer members for spacing, during use, the lower face of said main body with respect to the surface to be vacuumed.

[0014] The spacer members may comprise a longitudinal rib system and/or a wheel system.

[0015] The longitudinal rib system may comprise a plurality of front longitudinal ribs, upstream of said transverse slot, and a plurality of rear longitudinal ribs, downstream of said transverse slot.

[0016] The longitudinal rib system may also advantageously comprise two lateral edges along the two lateral sides of the accessory.

[0017] The wheel system may comprise four wheels arranged within the general contour of the accessory or arranged outside the general contour of the accessory.

[0018] According to an embodiment of the present invention, additional transverse elements may also be present upstream and downstream of the transverse slot.

[0019] The additional transverse elements may be movable from a retracted non-protruding position to an extended position protruding towards the surface to be vacuumed.

[0020] The additional transverse elements may be rubber or similar bristled members, .

[0021] According to another aspect, the present invention provides a suction head for a vacuum cleaner, the suction head comprising a base plate shaped so as to have at least one base plate channel open towards a surface to be vacuumed, a suction channel which, during use, is joined to the base plate and is in fluid communication with the base plate channel and, optionally, a covering body which is connected to the base plate and/or to the suction channel, further comprising an accessory as said above mounted to said suction head in a removable manner.

[0022] The accessory is preferably mounted, in a removable manner, to the base plate of the suction head.

BRIEF DESCRIPTION OF THE FIGURES

[0023] The invention will become clearer from the following detailed description, provided purely by way of a non-limiting example, to be read with reference to the accompanying drawings, in which:

- Figure 1 is an axonometric view of a suction head and an accessory according to a first embodiment in a configuration where they are separated from each other;
- Figure 2 is another axonometric view of the suction head separate from the accessory according to the first embodiment of the invention;
- Figure 3 is an axonometric view of the suction head with the accessory according to the first embodiment mounted thereon;
- Figure 4 is an axonometric view, from below, of the suction head with the accessory according to the first embodiment mounted thereon;
- Figure 5 is an axonometric view, from below, of the suction head with an accessory according to a second embodiment mounted thereon;
- Figure 6 is an axonometric view, from below, of a suction head with an accessory according to a third embodiment mounted thereon;
- Figure 7 is an axonometric view, from below, of a suction head with an accessory according to a fourth embodiment mounted thereon; and
- Figure 8 is an axonometric view, from below, of a suction head with an accessory according to a fifth embodiment mounted thereon.

DETAILED DESCRIPTION

[0024] The various figures show by way of example a number of embodiments of an accessory for a suction head of a vacuum cleaner or the like. The accessory is configured to cooperate with a suction head in order to improve the suction performance on substantially smooth and compact surfaces such as floors consisting of stone (marble or similar), terracotta, clinker, cement, resin, tiles, parquet or the like. In particular, the accessory is configured to vacuum large-size debris.

[0025] The accessory is configured to be engaged with a suction head, preferably in a removable manner. According to an embodiment of the invention, the accessory

is configured to be removably coupled with the base plate of a suction head.

[0026] As mentioned above, a suction head 1 comprises a base plate 11 shaped so as to have at least one base plate channel 12 open towards a surface to be vacuumed, a suction channel which, during use, is joined to the base plate 11 and is in fluid communication with the base plate channel 12 and optionally a covering body 15 which can be connected to the base plate 11 and/or to the suction channel. The other end of the suction channel communicates with a suction tube, usually via a rotatable joint.

[0027] Therefore, if large-size debris does not have to be removed, the suction head 1 is used without the accessory mounted. Advantageously, the suction head 1 is complete also with the base plate 11 and may be used without the accessory. The accessory is mounted on the suction head (in particular on its base plate 11) when there is a need to vacuum large-size debris.

[0028] By way of example, five embodiments of the accessory to be mounted on a suction head 1 are illustrated and described. The first embodiment (identified by the reference number 201) is shown with reference to Figures 1-4. Figures 5-8 show instead the four other embodiments (identified by the reference numbers 202, 203, 204 and 205). As far possible, for the various embodiments the same reference numbers will be used to indicate the same components or functionally equivalent components.

First embodiment

[0029] The accessory 201 according to the first embodiment comprises a substantially flat main body 21 having a shape and dimensions substantially corresponding to those of the base plate 11 of the suction head 1 on which the accessory 201 will be mounted.

[0030] The main body 21 has a lower face 21A directed towards the surface to be vacuumed and an opposite top face 21B. The top face 21B is configured so as to have engaging members 29 for engaging in a removable manner with the suction head 1, typically the base plate 11 of the suction head 1. By way of example, the engaging members 29 may comprise partially deformable pins with a wider head which are able to engage inside respective recesses (not shown) in the base plate of the suction head 1. Alternatively or in addition to the engaging members 29 shown in Figure 1, Velcro® strips or another functionally equivalent system may be provided.

[0031] The base plate 11 of the suction head 1 is shown in Figure 2. This figure also shows the base plate channel 12, the surface around said channel (which often is decisive for the vacuuming performance), and the two seats for strips of velvet.

[0032] Typically, the accessory 201 has a substantially rectangular shape and has a transverse slot 22. The transverse slot 22 has a form and a size and is positioned so as to be situated in correspondence with the mouth of the base plate channel 12 of the suction head on which the accessory 201 has to be mounted.

[0033] The lower face 21A directed towards the surface to be vacuumed is substantially smooth.

[0034] Preferably, two edges 23 which extend downwards are provided on the two sides of the main body 21. The ends of the edges 23 are configured to make contact with (or lightly touch) the surface to be vacuumed. In this way, the lower face 21A is located at a distance from the surface to be vacuumed equal to the height of the edges 23.

[0035] According to the first embodiment of the present invention, a longitudinal rib 24 which extends downwards substantially over a distance equal to that of the edges is provided in front of and/or at the rear of the transverse slot 22. Preferably, a plurality of longitudinal ribs 24 are provided both in front of and behind the transverse slot 22. These longitudinal ribs 24 provide the main body with rigidity and define further contact lines for distributing the pressure exerted so that the pressure is not concentrated in one point. Advantageously, the longitudinal ribs 24 also define tunnels for conveying the large debris the base plate 11. Preferably, the front longitudinal ribs extend towards the transverse slot 22 and therefore towards the channel 12 of substantially from the front edge of the accessory 201 to the front edge of the transverse slot 22. Preferably, the back longitudinal ribs extend substantially from the rear edge of the transverse slot 22 to the rear edge of the accessory 201. Each rib can be continuous or discontinuous, namely with gaps.

[0036] The number of longitudinal ribs 24 may consist of any number greater than 2. In any case, the Applicant has noted that ribs which are too close together create tunnels which are too narrow and which could become clogged up with large debris. According to embodiments, the longitudinal ribs 24 may advantageously be 4 or 5 in number. The number of ribs may be the same both at the front and at the rear, but may also be different. For example, there may be four front ribs and five rear ribs. This also due to the fact that the rear surface is typically bigger than the front surface and therefore is weaker.

[0037] The height of the longitudinal ribs 24 depends on the dimensions of the debris to be vacuumed. Preferably, the height of the longitudinal ribs 24 is greater than 2 mm. More preferably it is greater than 3 mm. Preferably, the height of the longitudinal ribs 24 is smaller than 5 mm. More preferably, the height of the ribs 4 is smaller than 4 mm.

[0038] In the present description and in the claims, all the numerical values, for example a linear measurement or a diameter, unless expressly indicated, are understood as being preceded by the term "about".

[0039] According to the first embodiment, the accessory comprises wheels 25 for favouring the movement of the accessory 201 (when mounted on a suction head) over the surface to be vacuumed.

[0040] According to the first embodiment, the wheels 25 are situated inside the contour of the accessory 201.

[0041] The wheels 25 may be two, three or four in number (as shown in the embodiment). The configuration with four wheels, each in the vicinity of a corner of the accessory 201, is that preferred for reasons of stability and efficiency.

[0042] The accessory 201 according to the first embodiment may be made of any material, but preferably is made of a thermoplastic material. This material is advantageous since it is sufficiently soft not to damage the surface to be vacuumed and, at the same time, is sufficiently rigid to withstand impacts or in any case not be subject to deformation with time.

[0043] The accessory 201 may be sold together with the vacuum cleaner so as to increase its versatility and efficiency, also for the vacuuming of large-size debris.

Second embodiment

[0044] The accessory 202 according to the second embodiment is shown, coupled with a suction head 1, in Figure 5.

[0045] The accessory 202 according to the second embodiment is similar to that of the first embodiment and therefore a detailed description will not be repeated. The main difference lies in the fact that the wheels 25 are situated on the outside of the contour of the accessory 202. This configuration makes the accessory 202 (and therefore the entire suction head) more stable. Moreover, the accessory 202 is lower and therefore less bulky than that of the first embodiment.

Third embodiment

[0046] The accessory 203 according to the third embodiment is shown, coupled with a suction head 1, in Figure 6.

[0047] The accessory 203 according to the third embodiment is similar to that of the first embodiment and therefore a detailed description will not be repeated. The main difference lies in the fact that there are no longitudinal ribs 24 and the lower face 21A of the main body 21 takes the form of a substantially smooth surface.

[0048] This configuration makes the accessory 203 (and therefore the entire suction head) lighter. Moreover, the accessory is able to suck up also relatively large debris, without the risk of this debris getting stuck between one rib and another.

Fourth embodiment

[0049] The accessory 204 according to the fourth embodiment is shown, coupled with a suction head 1, in Figure 7.

[0050] The accessory 204 according to the fourth embodiment is similar to that of the first embodiment and therefore a detailed description will not be repeated. The main difference lies in the fact that there are no wheels. The accessory is therefore configured to make sliding contact (via the ribs 24) with the surface to be vacuumed.

[0051] This configuration makes the accessory 204 (and therefore the entire suction head) lighter, thinner, less expensive and stronger. However, the ribs, which are subject to a greater degree of wear, risk causing damage to the surface being vacuumed (for example in the case of parquet) and may cause a rubbing noise.

Fifth embodiment

[0052] The accessory 205 according to the fifth embodiment is shown, coupled with a suction head 1, in Figure 8.

[0053] The accessory 205 according to the fifth embodiment is similar to that of the first embodiment and therefore a detailed description will not be repeated. The main difference lies in the fact that additional transverse elements 26 are provided. According to embodiments, additional front or rear transverse elements 26 with respect to the transverse slot 22 are provided. However, according to a preferred embodiment, additional front and rear transverse elements 26 with respect to the transverse slot 22 are provided.

[0054] The additional transverse elements 26 may be aligned with each other (such as the front elements in Figure 8) or not aligned with each other (such as the rear elements in Figure 8).

[0055] The additional transverse elements 26 may be fixed or, preferably, movable. In the embodiment with movable transverse elements, these transverse elements are movable between a first position which is inset, i.e. not projecting from the lower face 21A of the main body, and a projecting position, such as that shown in Figure 8. The system for retracting or extracting the additional transverse elements 26 may be similar to the known systems for lowering or raising a bristled or rubber insert, by means of operation of a pushbutton. The additional transverse elements 26 may be in the form of bristled, natural rubber or thermoplastic rubber bars, and could be extruded or co-moulded profiles.

[0056] The additional transverse elements are configured to remain in the lowered position during suction of the small-size or medium-size debris and to be retracted when it is required to suck up large-size debris, thus freeing the space between the ribs. In this way, the suction efficiency is greater when there are no large debris to be vacuumed, but the same accessory also allows the vacuuming of large debris. Therefore, with the accessory according to the invention it is possible to suck up the fragments of a broken sugar bowl which has fallen onto the floor and the sugar originally contained inside the bowl.

[0057] The longitudinal ribs 24 may be straight and directed in the longitudinal direction or may be inclined with respect to the longitudinal direction. They may also not have rectilinear progression, but instead have a sinusoidal or similar progression.

Claims

1. An accessory (201, 202, 203, 204, 205) for a suction head (1) for a vacuum cleaner, said accessory (201-205) comprising engaging means (29) configured for removably connecting said accessory to said suction head (1) at its base plate (11),
wherein said accessory (201-205) comprises a main body (21) having a lower face (21A) which, during use, is directed towards the surface to be vacuumed, and a top face (21B) comprising said engaging means (29)
wherein said main body (21) comprises a transverse slot (22) configured to be situated in correspondence to the mouth of a channel (12) of the base plate (11) of the suction head (1) when said accessory (201-205) is connected to said suction head (1); and
wherein said main body (21) comprises spacer members (23, 24, 25) for spacing, during use, the lower face (21A) of said main body (21) with respect to the surface to be vacuumed.

2. The accessory (201-205) according to claim 1, wherein said spacer members (23, 24, 25) comprise a longitudinal rib system (23, 24).

3. The accessory (201-205) according to claim 2, wherein said longitudinal rib system (23, 24) comprises a plurality of front longitudinal ribs (24) upstream of said transverse slot (22) and a plurality of rear longitudinal ribs (24) downstream of said transverse slot (22).

4. The accessory (201-205) according to claim 2 or 3, wherein said longitudinal rib system (23, 24) comprises lateral edges (23) along the lateral sides of the accessory (201-205).

5. The accessory (201-205) according to any one of the preceding claims, wherein said spacer members (23, 24, 25) comprise a wheel system (25).

6. The accessory (201-205) according to claim 5, wherein said wheel system (25) comprises four wheels (25) arranged within the general contour of the accessory (201-205).

7. The accessory (201-205) according to claim 5 or 6, wherein said wheel system (25) comprises four wheels (25) arranged outside the general contour of the accessory (201-205).

8. The accessory (201-205) according to any one of the preceding claims, further comprising additional transverse elements (26) upstream and downstream of said transverse slot (22).

9. The accessory (201-205) according to claim 8, wherein said additional transverse elements (26) are movable from a retracted non-protruding position to an extended position protruding towards the surface to be vacuumed.

10. The accessory (201-205) according to claim 8 or 9, wherein said additional transverse elements (26) comprise rubber or similar bristled members.

11. A suction head (1) for a vacuum cleaner, the suction head (1) comprising a base plate (11) shaped so as to have at least one base plate channel (12) open towards a surface to be vacuumed, a suction channel which, during use, is joined to the base plate (11) and is in fluid communication with the base plate channel (12) and a covering body (15) which is connected to the base plate (11) and/or to the suction channel, further comprising an accessory (201-205) according to any one of the preceding claims mounted to said suction head in a removable manner.

12. The suction head (1) of claim 11, wherein said accessory (201-205) is mounted to the base plate (11) of the suction head (1).

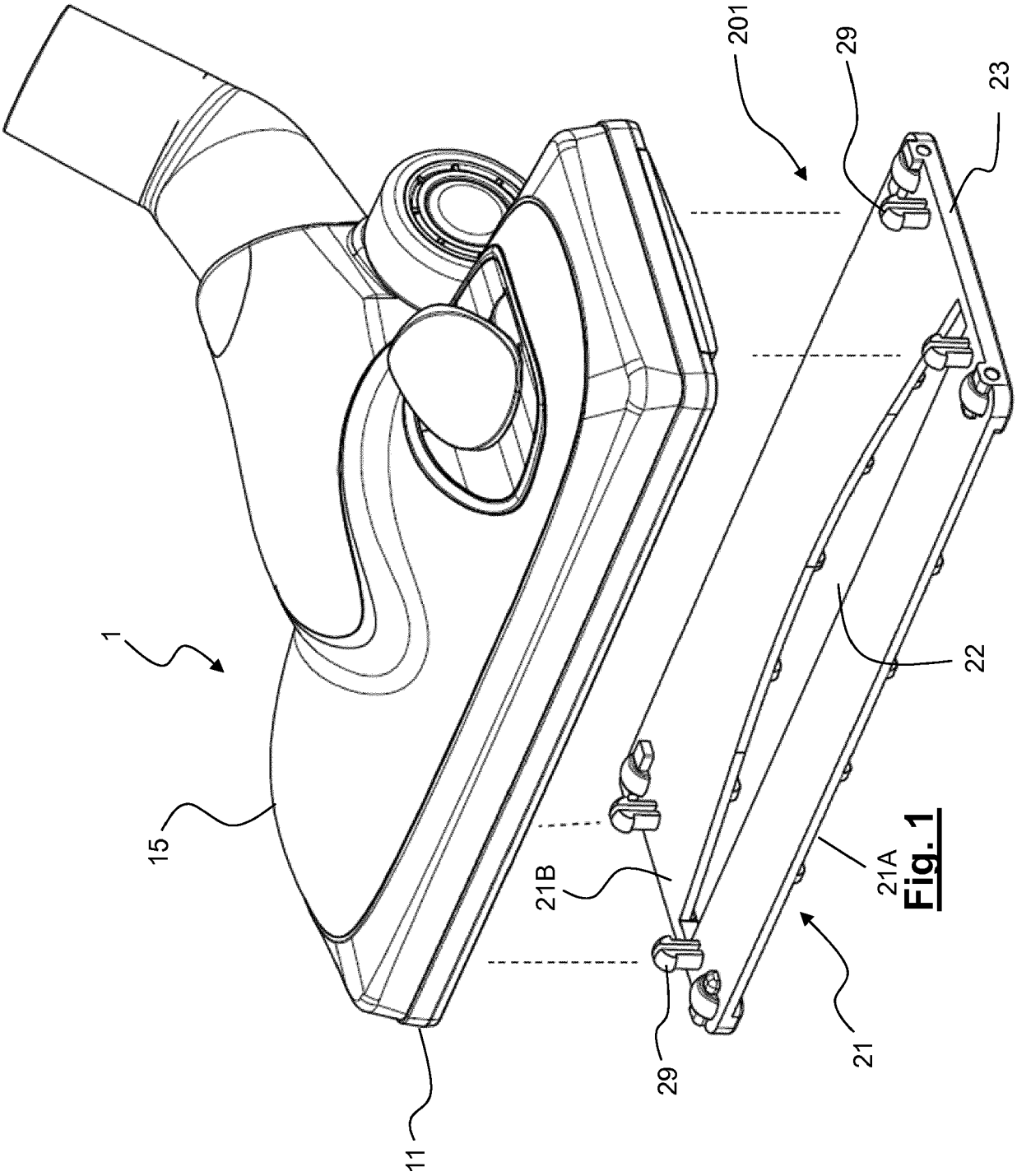

Fig. 1

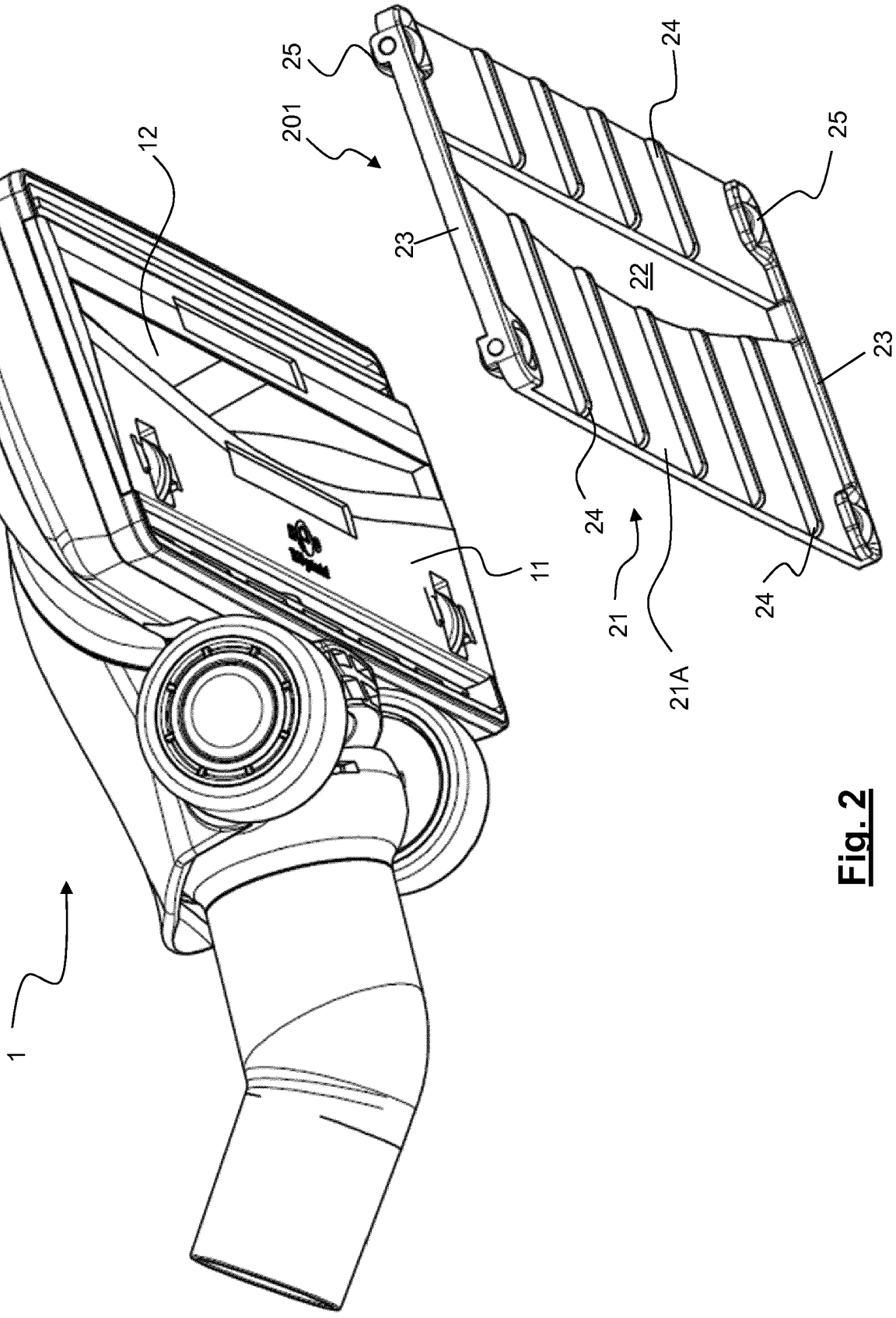

Fig. 2

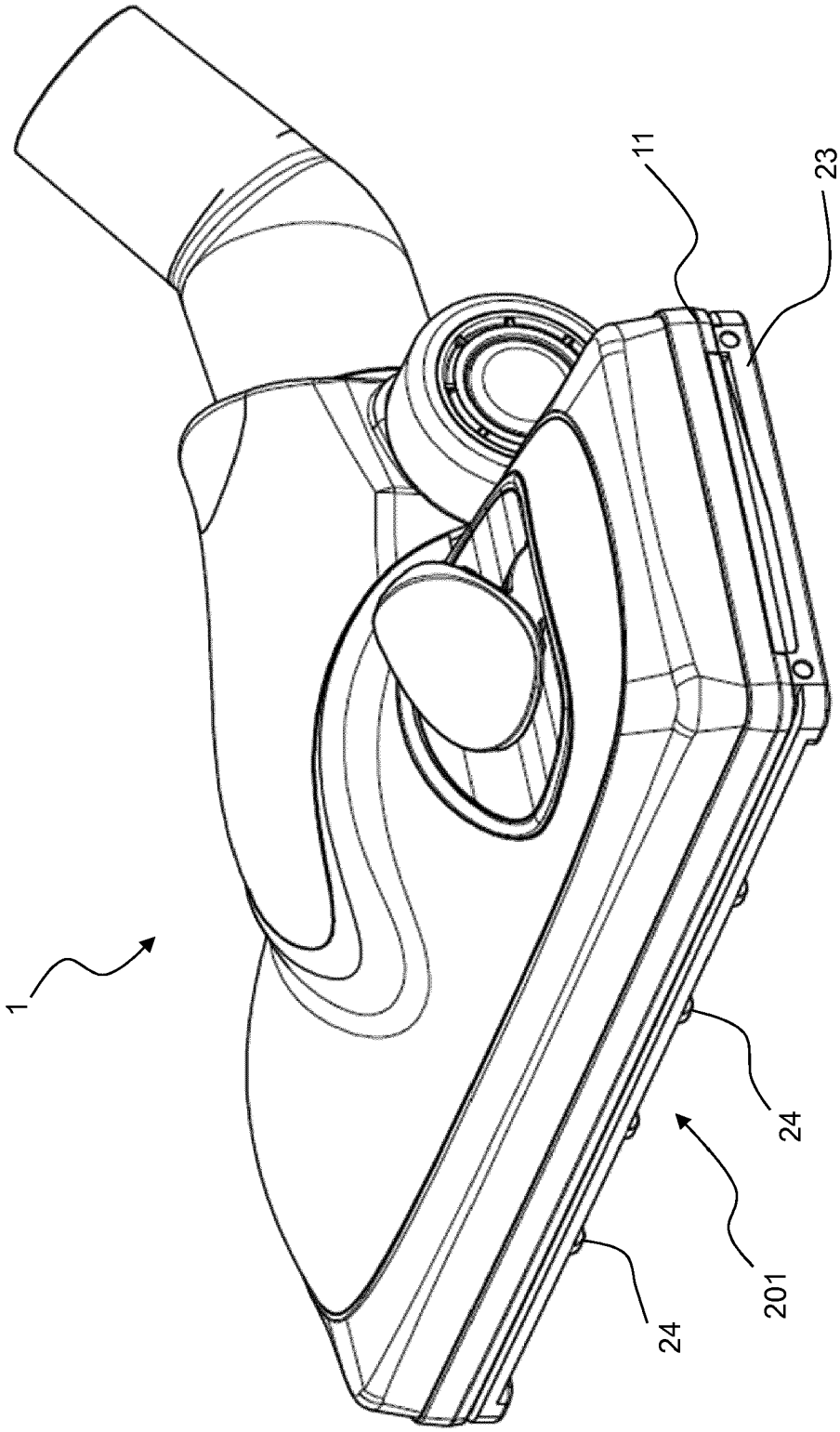

Fig. 3

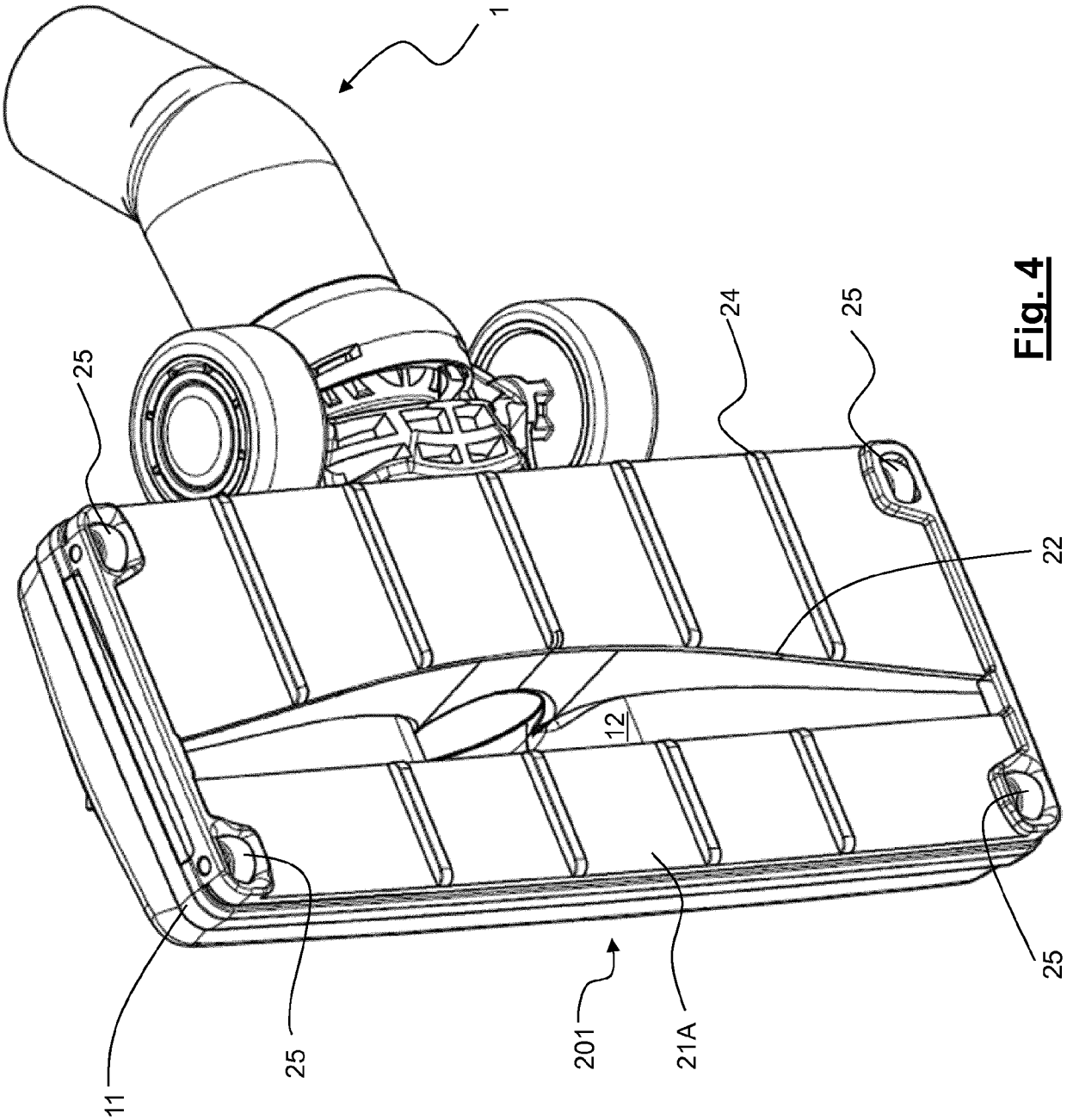

Fig. 4

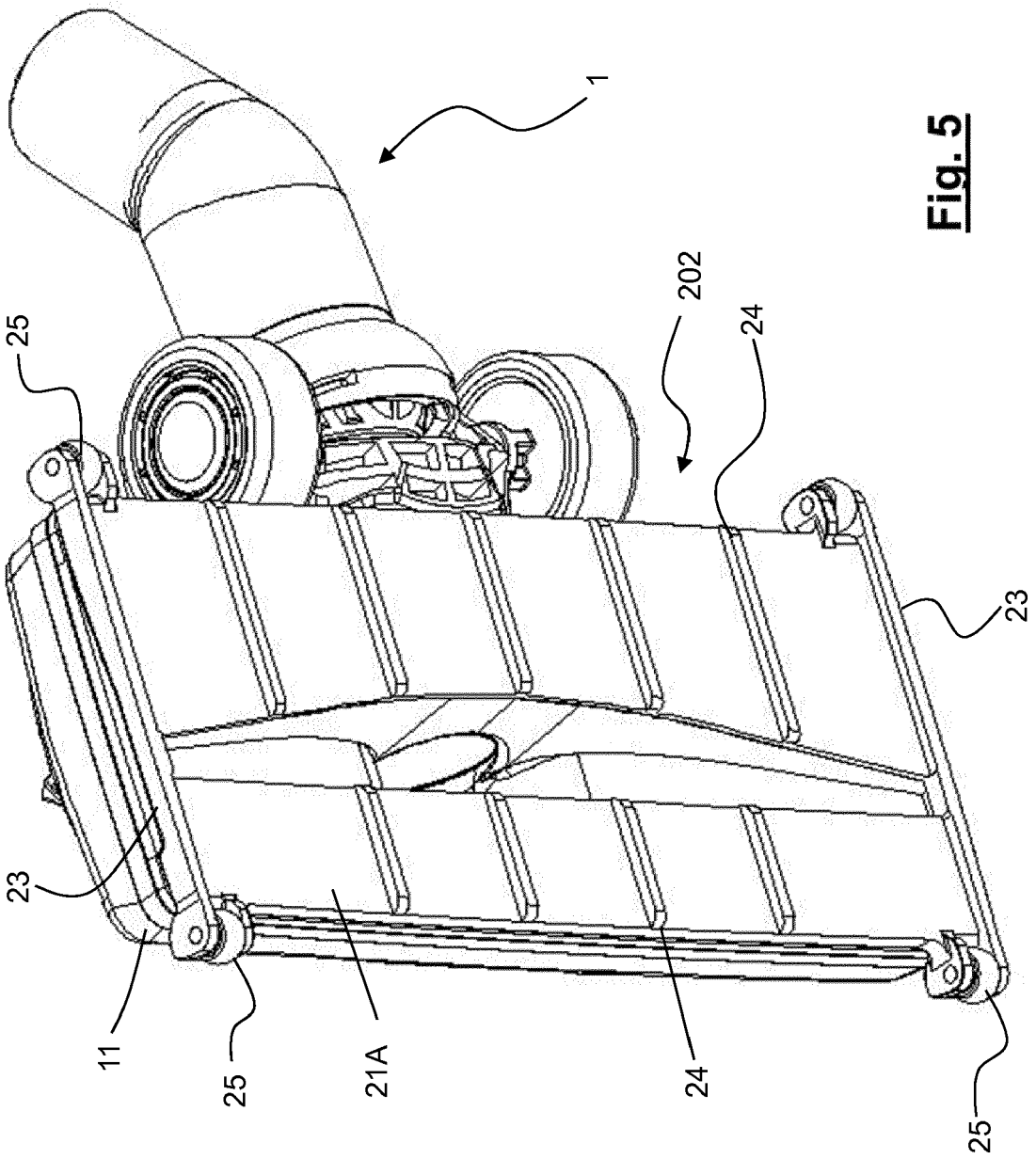

Fig. 5

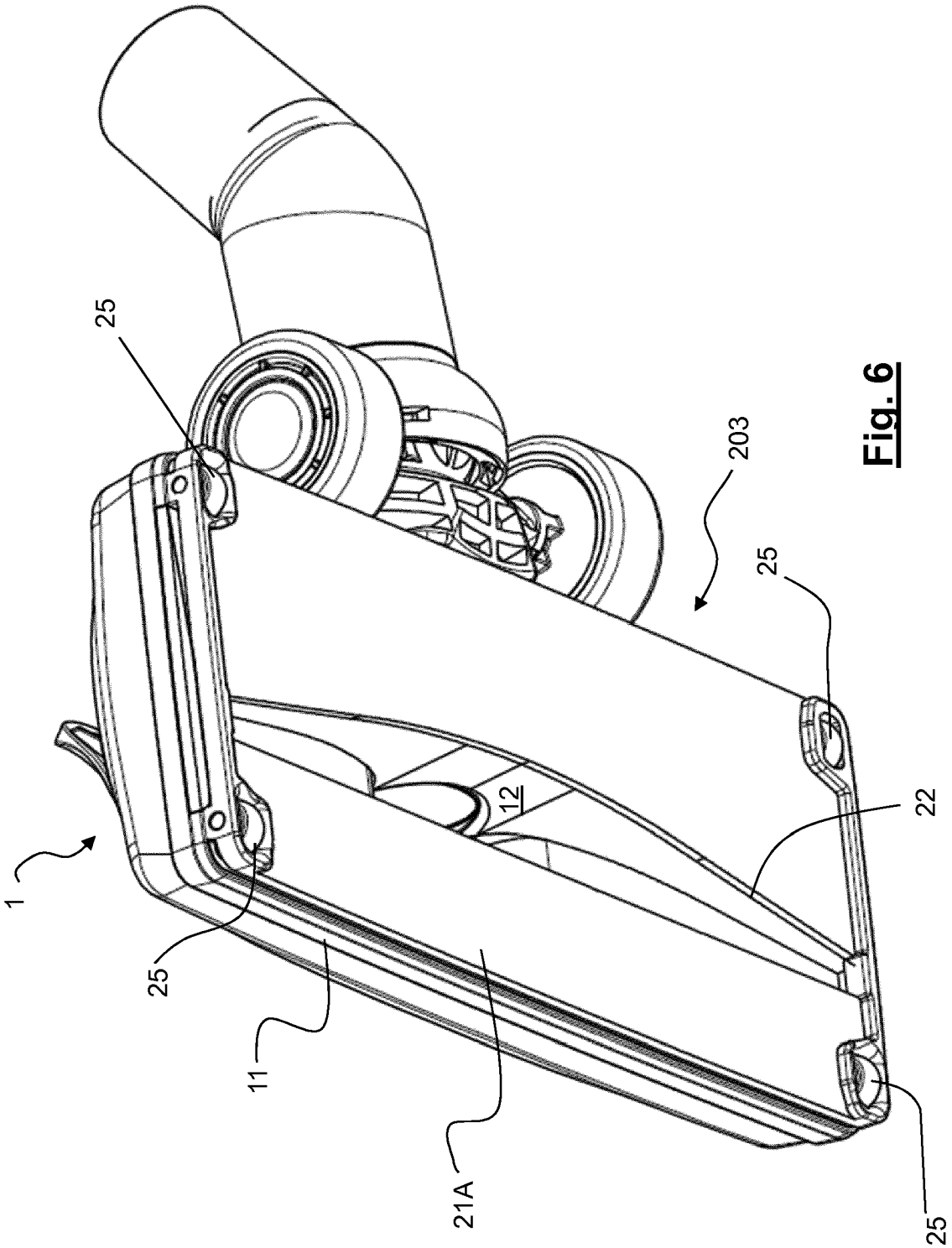

Fig. 6

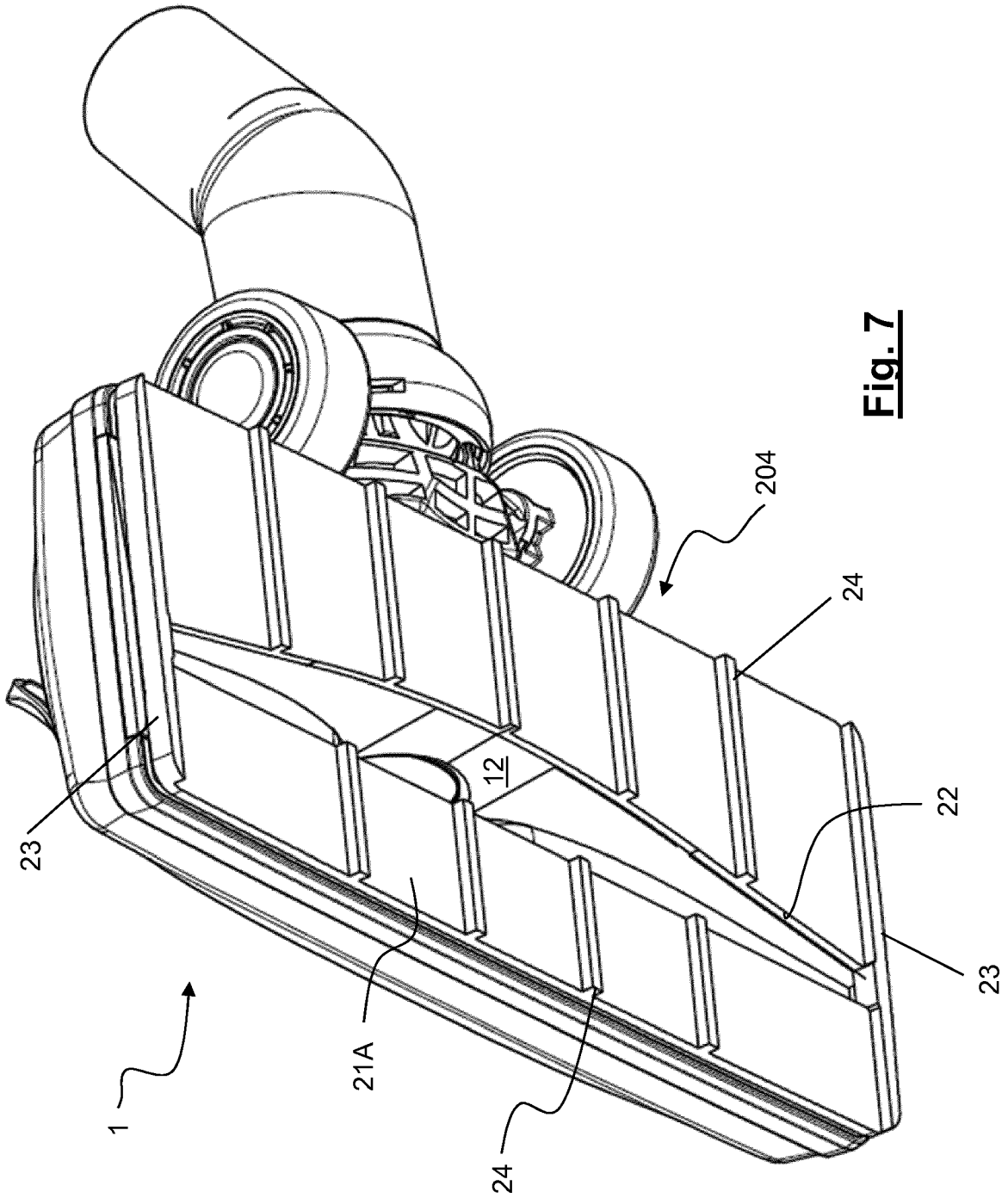

Fig. 7

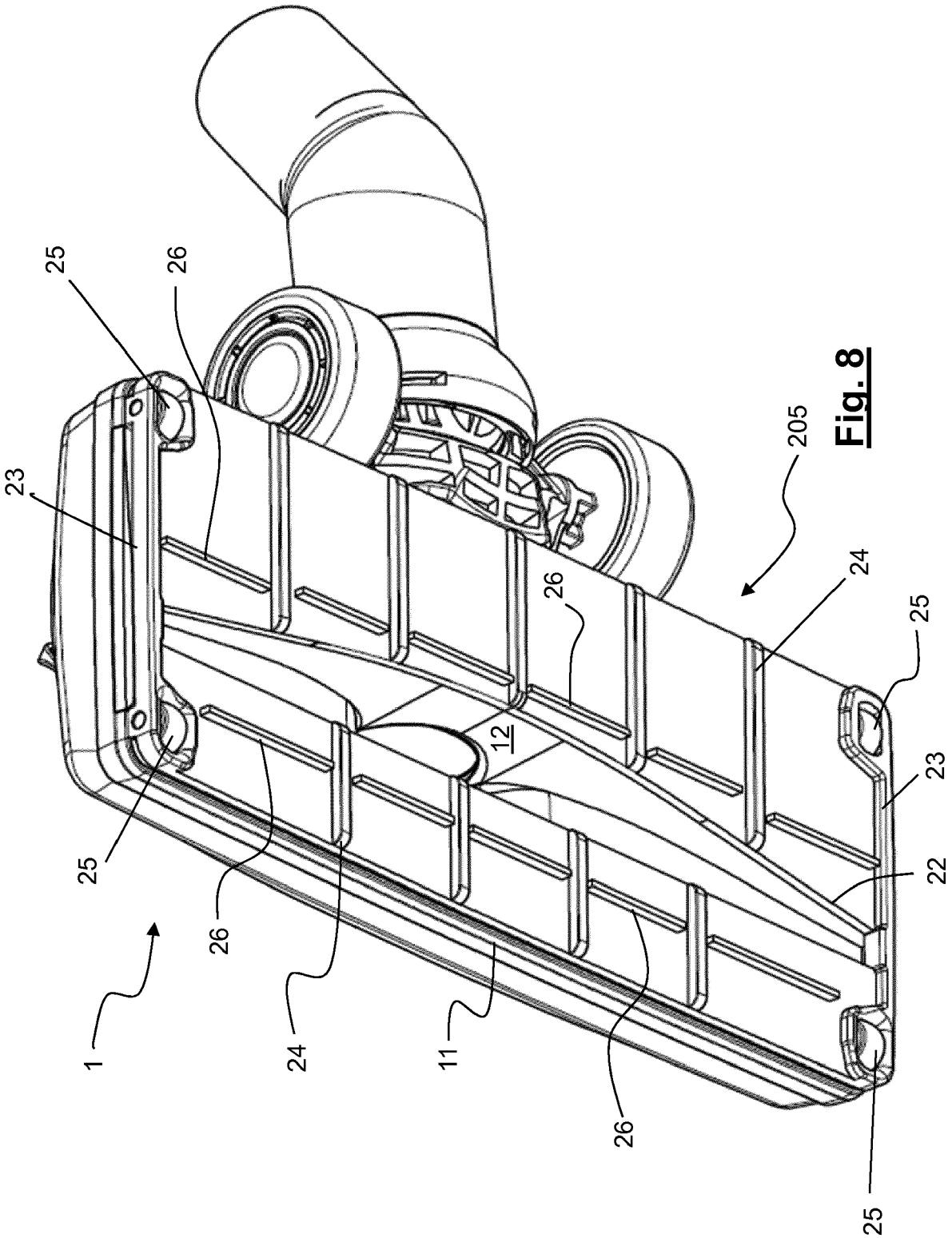

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 18 21 1206

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 June 2019	Hubrich, Klaus

CATEGORY OF CITED DOCUMENTS

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