

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application No. 61/757,875, filed January 29, 2013, the entire contents of which are incorporated by reference herein.

BACKGROUND

[0002] Vacuum cleaners typically include a suction nozzle, a cleaner housing connected to the suction nozzle, a suction generator in the cleaner housing, and a dirt collection vessel in the cleaner housing. In an upright-type vacuum cleaner, an elongate handle is coupled to the cleaner housing. The handle extends generally upwardly from the cleaner housing and transfers forces caused by the operator to the vacuum cleaner to move the vacuum cleaner over a surface to be cleaned.

SUMMARY

[0003] In one embodiment, an upright vacuum cleaner generally includes an upright assembly including a suction generator and a floor nozzle coupled to the upright assembly. The floor nozzle is configured for movement over a floor surface and includes a nozzle inlet in fluid communication with the suction generator. An aperture is formed through the floor nozzle and configured to allow the insertion of a hand of an operator to provide a gripping area on the floor nozzle adjacent the aperture to facilitate lifting and lowering the upright vacuum cleaner.

[0004] In another embodiment, an upright vacuum cleaner generally includes an upright assembly including a suction generator and a floor nozzle coupled to the upright assembly. The floor nozzle is configured for movement over a floor surface and includes a nozzle inlet disposed at a forward end of the floor nozzle and in fluid communication with the suction generator. An aperture is formed through the floor nozzle and disposed behind the nozzle inlet and entirely surrounded by walls of the floor nozzle. When viewed from above the floor nozzle, the aperture defines an area of approximately 20 cm² or more.

[0005] Other aspects of the invention will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

FIG. 1 is a perspective view of an upright vacuum cleaner with a floor nozzle according to one embodiment of the invention.

FIG. 2 is an enlarged perspective view illustrating

the floor nozzle of FIG. 1.

FIG. 3 is a plan view of the floor nozzle of FIG. 1.

FIG. 4 is a cross-sectional view taken along line 4-4 of FIG. 3.

FIG. 5 is a perspective view of an operator gripping the upright vacuum cleaner of FIG. 1 by the nozzle handle.

[0007] It should be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the above-described drawings. The invention is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

DETAILED DESCRIPTION

[0008] FIG. 1 is a perspective view of an upright vacuum cleaner 100, including an upright assembly 110 with a suction generator and a floor nozzle 130 coupled to the upright assembly 110. The floor nozzle 130 forms an opening in the bottom of the body and allows a dirty air stream to be drawn into the upright vacuum cleaner 100. The upright assembly 110 and the floor nozzle 130 are pivotally connected to one another such that the upright assembly 110 pivots relative to the floor nozzle 130 about an axis of rotation 115. As such, the upright assembly 110 is pivotal relative to the floor nozzle 130 between an upright position (see FIG. 1) and a number of inclined positions (see, e.g., FIG. 5). The floor nozzle 130 is in fluid communication with the suction generator, which is located in a motor housing between the floor nozzle 130 and the upright assembly 110. In the illustrated embodiment, the suction generator is positioned below the dirt cup 120.

[0009] The illustrated upright vacuum cleaner 100 is a dry vacuum cleaner capable of drawing in air and dirt such as dry debris. In alternative embodiments, the upright vacuum cleaner 100 may be a wet vacuum cleaner capable of drawing in air and dirt such as liquid and debris. Alternatively, the upright vacuum cleaner 100 may be an extractor capable of both dispensing liquid and drawing in air and dirt such as liquid and debris. In still other embodiments, the upright vacuum cleaner 100 may be a stick vacuum that does not include the brush rolls of other traditional upright cleaners.

[0010] Referring also to FIGS. 2-4, the floor nozzle 130 of the upright vacuum cleaner 100 is configured for movement over a floor surface S and includes a nozzle inlet 140 (see FIG. 4) in fluid communication with the suction generator 120. In the illustrated embodiment, the floor nozzle 130 includes a brush roll housing 150 defining the

nozzle inlet 140 at a forward end (i.e., to the left in FIG. 4) of the floor nozzle 130. In the illustrated embodiment, a brush roll 160 is coupled within the brush roll housing 150 for rotation. In other embodiments, for example in a stick vacuum, the nozzle inlet 140 may be disposed at a generally forward end of the floor nozzle 130 without the inclusion of a brush roll.

[0011] An aperture or opening 170 is formed through the floor nozzle 130. In the illustrated embodiment, the aperture 170 is entirely surrounded by walls 180 of the floor nozzle 130. In other embodiments, however, the aperture 170 may be merely partially surrounded by the walls 180 of the floor nozzle 130 and partially left open. As illustrated in FIGS. 2 and 3, a portion of the floor surface S is exposed at the aperture 170 when the floor nozzle 130 is positioned on the floor surface S in an upright position. In the illustrated embodiment, the aperture 170 is generally rectangular when viewed from above the floor nozzle 130. In other embodiments, however, the aperture 170 may assume any geometric form when viewed from above the floor nozzle 130, including, but not limited to, a polygon, an oval, an ellipse, a symbol, or a combination thereof.

[0012] In the illustrated embodiment, the aperture 170 is disposed behind or rearward to (i.e., to the right in FIG. 4) the brush roll housing 150. The illustrated brush roll housing 150 is generally C-shaped in cross section (see FIG. 4), and defines a curved forward wall 180 of the aperture 170. Accordingly, the illustrated aperture 170 tapers initially in width W in a direction from above the floor nozzle 130 toward the floor surface S. In the embodiment illustrated in FIG. 4, the aperture 170 abuts a rearward gripping area 190 so that the width W of the aperture 170 gradually increases toward the floor surface S, giving the aperture 170 a slightly flared profile in cross section. Other configurations are possible depending on the use requirements or preferences for the particular upright vacuum cleaner 100, including configurations where the aperture 170 has a substantially uniform width W in cross section.

[0013] In some embodiments, the aperture 170 is disposed behind the brush roll housing 150 spaced approximately 4 cm to approximately 15 cm from the forward end of the floor nozzle 130. In other embodiments, the spacing between the aperture 170 and the forward end of the floor nozzle 130 may assume other values. In still other embodiments, for example in a stick vacuum, the aperture 170 may be disposed behind the nozzle inlet 140 without regard to the brush roll housing 150. In some embodiments, the floor nozzle 130 defines a lateral dimension L_f ranging from approximately 25 cm to approximately 35 cm and the aperture 170 is positioned approximately at a center of the lateral dimension L_f . In other embodiments, the lateral dimension L_f may assume other values, and the aperture 170 may be positioned approximately at the respective center of the lateral dimension L_f . In still other embodiments, the aperture 170 may be positioned off-center relative to the lateral dimension L_f .

In some embodiments, the aperture 170 when viewed from above the floor nozzle 130 defines an area of approximately 20 cm² or more. In further embodiments, the aperture 170 when viewed from above the floor nozzle 130 defines an area of approximately 20 cm² to approximately 80 cm². In still further embodiments, the aperture 170 defines a lateral dimension L_a ranging from approximately 5 cm to approximately 10 cm. In other embodiments, the aperture may be dimensioned to suitably facilitate lifting and lowering the upright vacuum cleaner, as explained below.

[0014] Referring also to FIGS. 4 and 5, the aperture 170 is configured to allow the insertion of a hand H or fingers F of an operator to provide the gripping area 190 on the floor nozzle 130 adjacent the aperture 170 to facilitate lifting and lowering the upright vacuum cleaner 100. In the illustrated embodiment, the gripping area 190 is disposed on the floor nozzle 130 behind or rearward to the aperture 170 (i.e., to the right in FIG. 4). In some embodiments, the gripping area 190 may extend substantially parallel to the brush roll housing 150. In other embodiments, however, the gripping area 190 may extend non-parallel (e.g., angled) to the brush roll housing 150.

[0015] As illustrated in FIG. 4, the brush roll housing 150 defines a brush roll housing bottom surface 200, and the gripping area 190 defines a gripping area bottom surface 210. The brush roll housing bottom surface 200 is disposed adjacent the floor surface S, and the gripping area bottom surface 210 is disposed above the brush roll housing bottom surface 200 when the floor nozzle 130 is in an upright position. Accordingly, the brush roll housing bottom surface 200 and the gripping area bottom surface 210 define a vertical gap G therebetween. In some embodiments, the gap G ranges from approximately 2 cm to approximately 4 cm to fittingly receive the operator's fingers F for lifting and lowering the upright vacuum cleaner 100. In other embodiment, the gap G may be dimensioned otherwise to fittingly receive the operator's fingers F for lifting and lowering the upright vacuum cleaner.

[0016] In operation, the operator may utilize or access the aperture 170 for lifting or lowering the upright vacuum cleaner 100, for example, to make stair cleaning easier. As illustrated in FIG. 5, the operator may hold a part of the upright assembly 110 of the upright vacuum cleaner 100 with one hand, e.g., the right hand, and then insert the other hand, e.g., the left hand, into the aperture 170 formed through the floor nozzle 130, so as to grab the gripping area bottom surface 210 of the floor nozzle 130 with the left finger F tips, and lift or lower the upright vacuum cleaner 100 using both hands.

[0017] Although the invention has been described in detail with reference to certain preferred embodiments, variations and modifications exist within the scope and spirit of one or more independent aspects of the invention as described.

Claims**1.** An upright vacuum cleaner comprising:

an upright assembly including a suction generator; and
 a floor nozzle coupled to the upright assembly and configured for movement over a floor surface, wherein the floor nozzle includes a nozzle inlet in fluid communication with the suction generator, and wherein the floor nozzle includes an aperture formed therethrough, the aperture configured to allow the insertion of a hand of an operator to provide a gripping area on the floor nozzle adjacent the aperture to facilitate lifting and lowering the upright vacuum cleaner.

2. The upright vacuum cleaner of claim 1, wherein the floor nozzle further includes a brush roll housing defining the nozzle inlet at a forward end of the floor nozzle, and a brush roll coupled for rotation within the brush roll housing, and wherein the aperture is disposed behind the brush roll housing.**3.** The upright vacuum cleaner of claim 2, wherein the gripping area is disposed on the floor nozzle behind the aperture.**4.** The upright vacuum cleaner of claim 2, wherein the gripping area extends substantially parallel to the brush roll housing.**5.** The upright vacuum cleaner of claim 2, wherein the brush roll housing defines a brush roll housing bottom surface, wherein the gripping area defines a gripping area bottom surface, wherein the brush roll housing bottom surface is disposed adjacent the floor surface, and wherein the gripping area bottom surface is disposed above the brush roll housing bottom surface when the floor nozzle is in an upright position.**6.** The upright vacuum cleaner of claim 5, wherein the brush roll housing bottom surface and the gripping area bottom surface define a vertical gap therebetween, and the gap is dimensioned to fittingly receive the operator's fingers for lifting and lowering the upright vacuum cleaner.**7.** The upright vacuum cleaner of claim 1, wherein the floor nozzle defines a lateral dimension and wherein the aperture is positioned approximately at a center of the lateral dimension.**8.** The upright vacuum cleaner of claim 1, wherein a portion of the floor surface is exposed at the aperture when the floor nozzle is positioned on the floor surface in an upright position.**9.** The upright vacuum cleaner of claim 1, wherein the aperture is generally rectangular when viewed from above the floor nozzle.**10.** An upright vacuum cleaner comprising:

an upright assembly including a suction generator; and
 a floor nozzle coupled to the upright assembly and configured for movement over a floor surface, wherein the floor nozzle includes a nozzle inlet disposed at a forward end of the floor nozzle and in fluid communication with the suction generator, and wherein the floor nozzle includes an aperture formed therethrough, the aperture being disposed behind the nozzle inlet and entirely surrounded by walls of the floor nozzle, wherein the aperture when viewed from above the floor nozzle defines an area of approximately 20 cm² or more.

11. The upright vacuum cleaner of claim 10, wherein the aperture when viewed from above the floor nozzle defines an area of approximately 20 cm² to approximately 35 cm².**12.** The upright vacuum cleaner of claim 10, wherein the aperture defines a lateral dimension ranging from approximately 5 cm to approximately 10 cm.**13.** The upright vacuum cleaner of claim 10, wherein the floor nozzle further includes a brush roll housing defining the nozzle inlet, and a brush roll coupled for rotation within the brush roll housing, and wherein the aperture is disposed behind the brush roll housing spaced approximately 5 cm to approximately 15 cm from the forward end of the floor nozzle.**14.** The upright vacuum cleaner of claim 13, wherein the gripping area is disposed on the floor nozzle behind the aperture.**15.** The upright vacuum cleaner of claim 13, wherein the gripping area extends substantially parallel to the brush roll housing.**16.** The upright vacuum cleaner of claim 13, wherein the brush roll housing defines a brush roll housing bottom surface, wherein the gripping area defines a gripping area bottom surface, wherein the brush roll housing bottom surface is disposed adjacent the floor surface, and wherein the gripping area bottom surface is disposed above the brush roll housing bottom surface when the floor nozzle is in an upright position.**17.** The upright vacuum cleaner of claim 16, wherein the brush roll housing bottom surface and the gripping

area bottom surface define a vertical gap therebetween, and the gap ranges from approximately 2 cm to approximately 4 cm to fittingly receive an operator's fingers for lifting and lowering the upright vacuum cleaner.

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18. The upright vacuum cleaner of claim 10, wherein the floor nozzle defines a lateral dimension ranging from approximately 25 cm to approximately 35 cm and wherein the aperture is positioned approximately at a center of the lateral dimension. 10
19. The upright vacuum cleaner of claim 10, wherein a portion of the floor surface is exposed at the aperture when the floor nozzle is positioned on the floor surface in an upright position. 15
20. The upright vacuum cleaner of claim 10, wherein the aperture is generally rectangular when viewed from above the floor nozzle. 20

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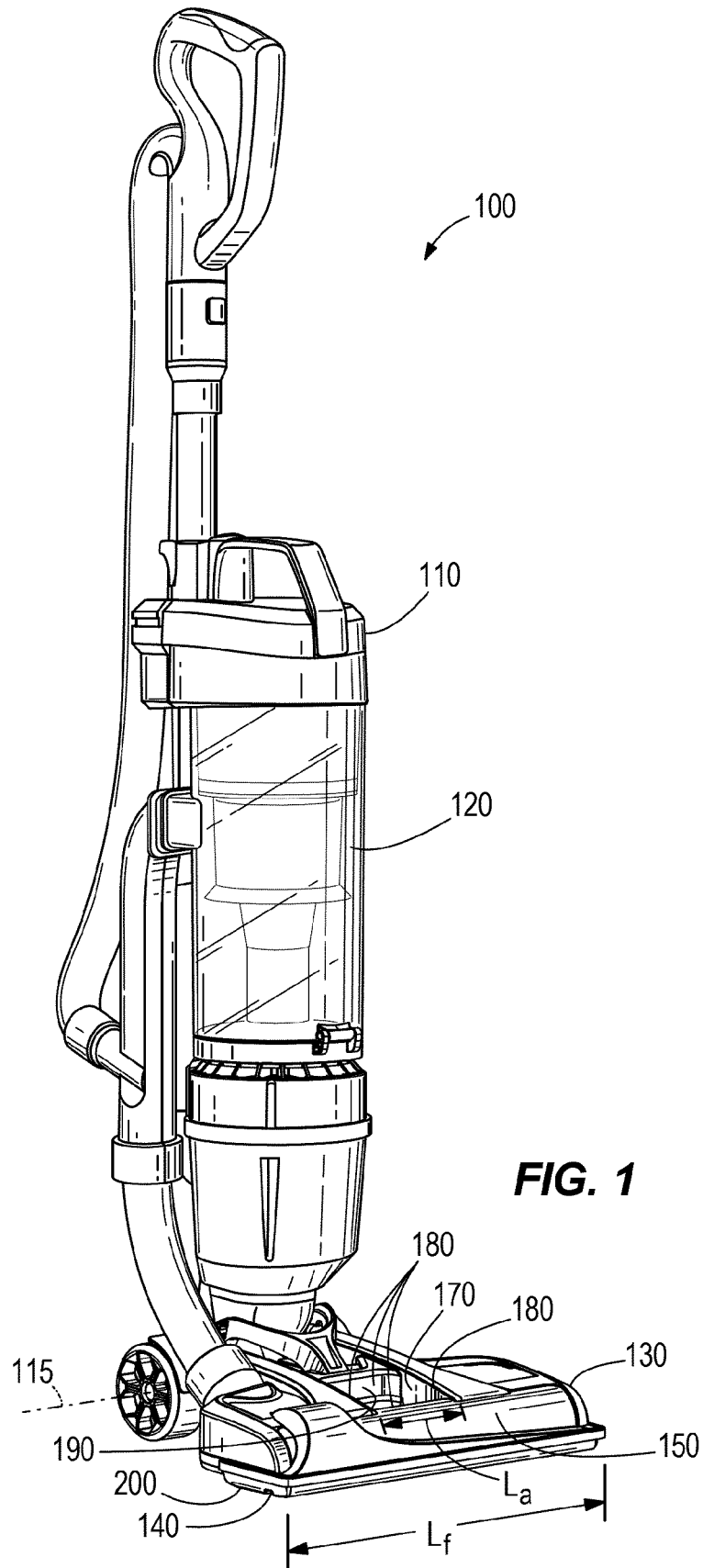
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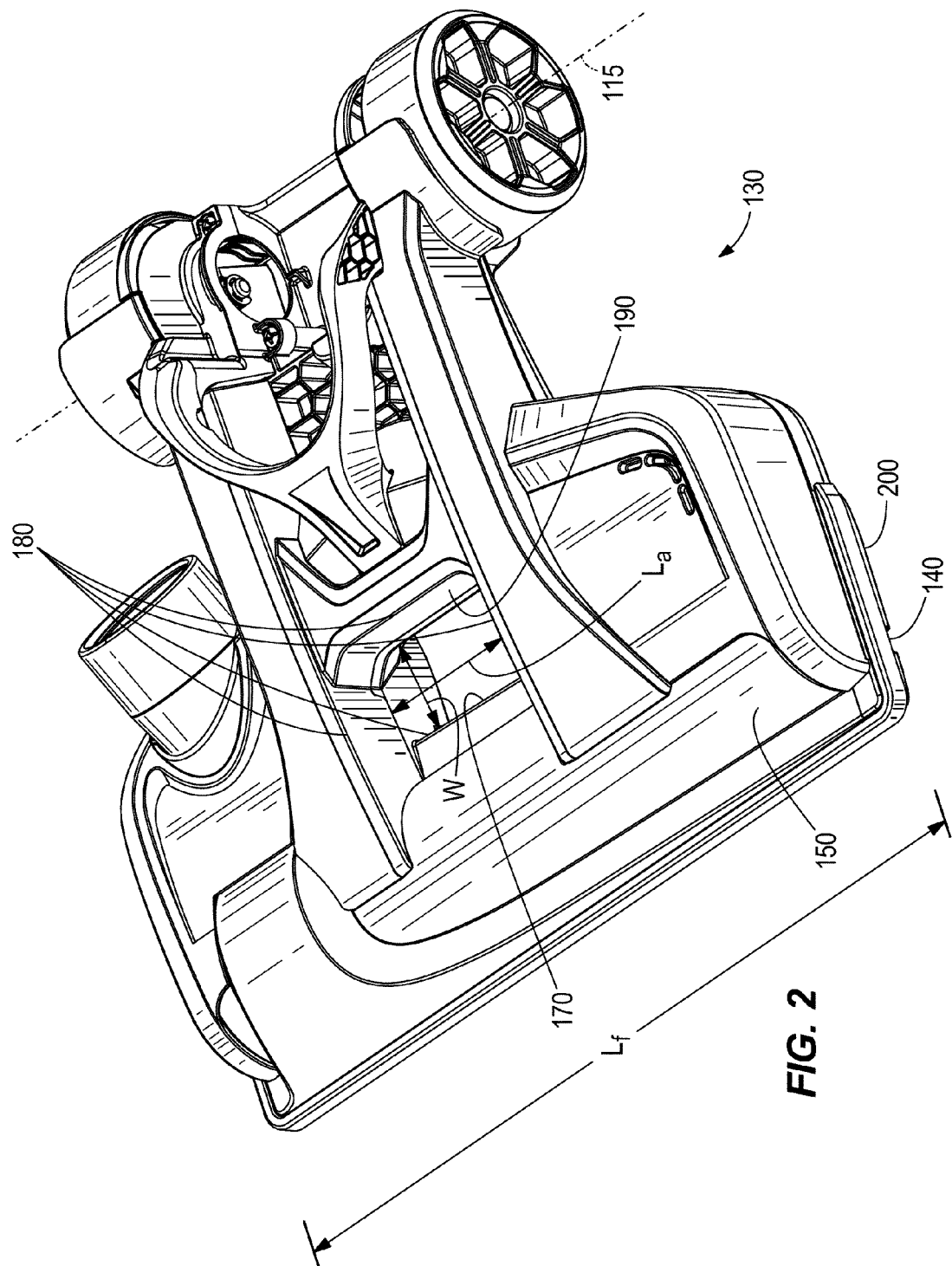
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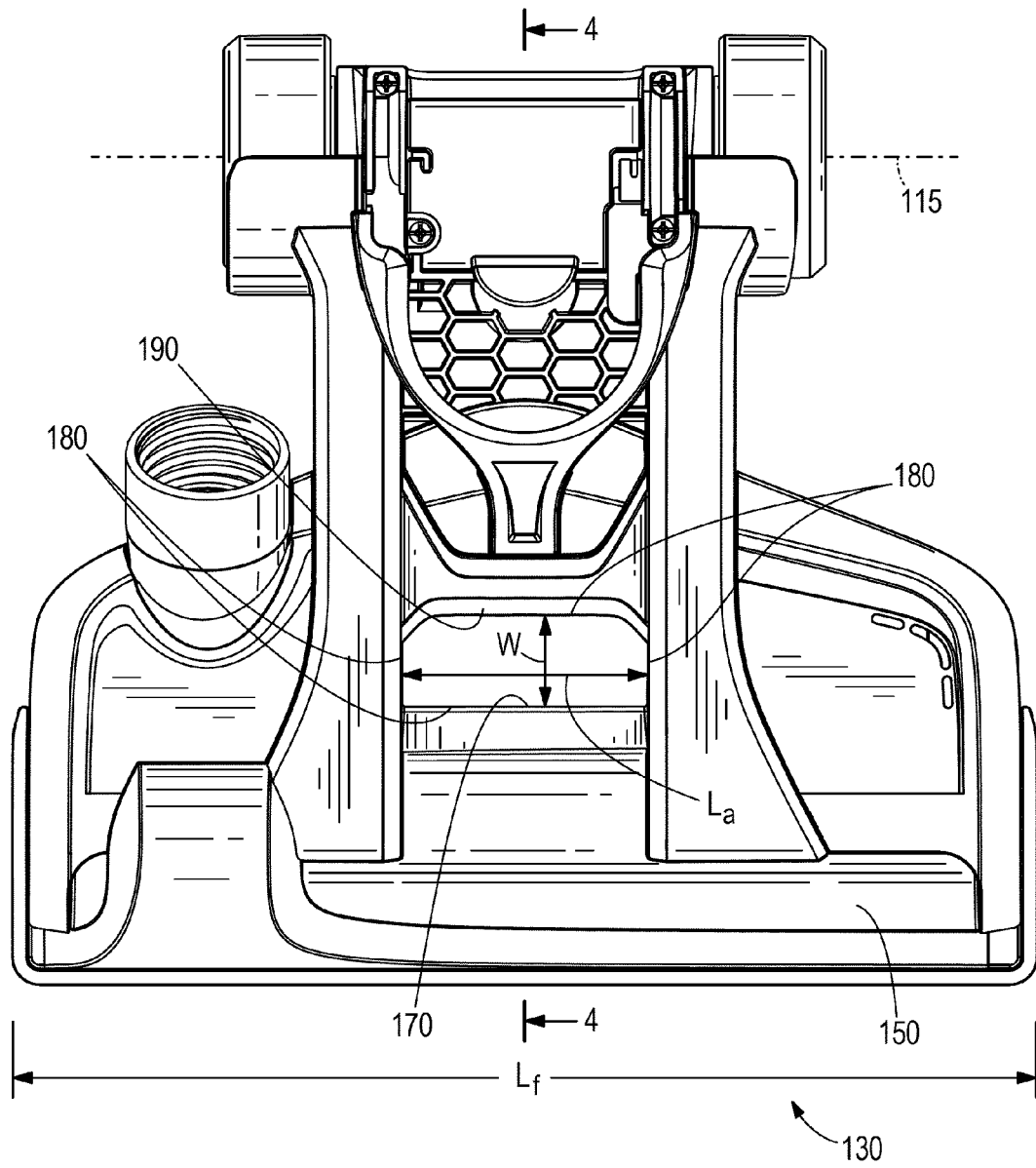
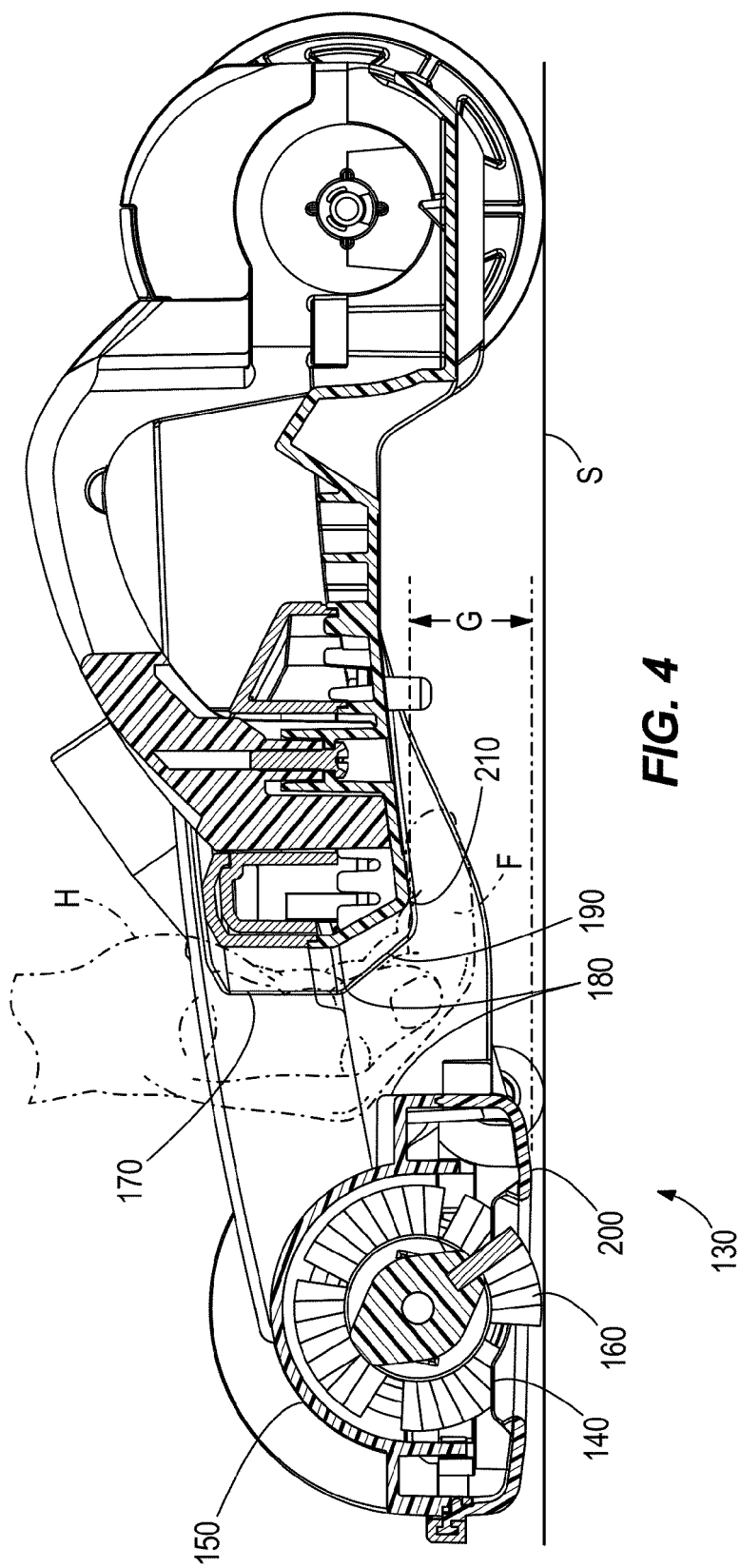
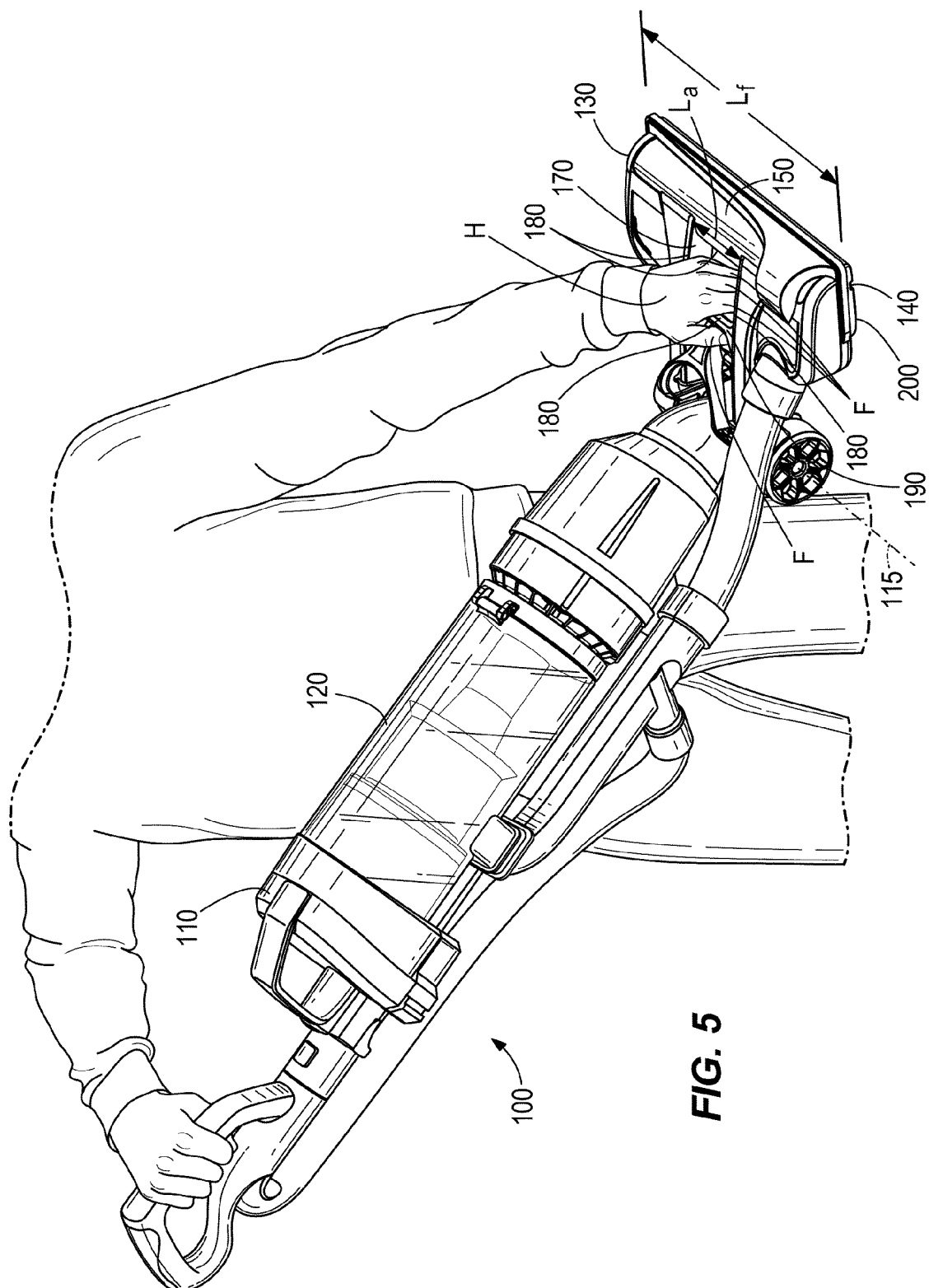


FIG. 3







EUROPEAN SEARCH REPORT

Application Number
EP 14 15 2528

| 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) |
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| The present search report has been drawn up for all claims | | | |
| Place of search Munich | | Date of completion of the search 12 March 2014 | Examiner Blumenberg, Claus |
| CATEGORY OF CITED DOCUMENTS | | T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | |
| X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document | | | |

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 15 2528

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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12-03-2014

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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