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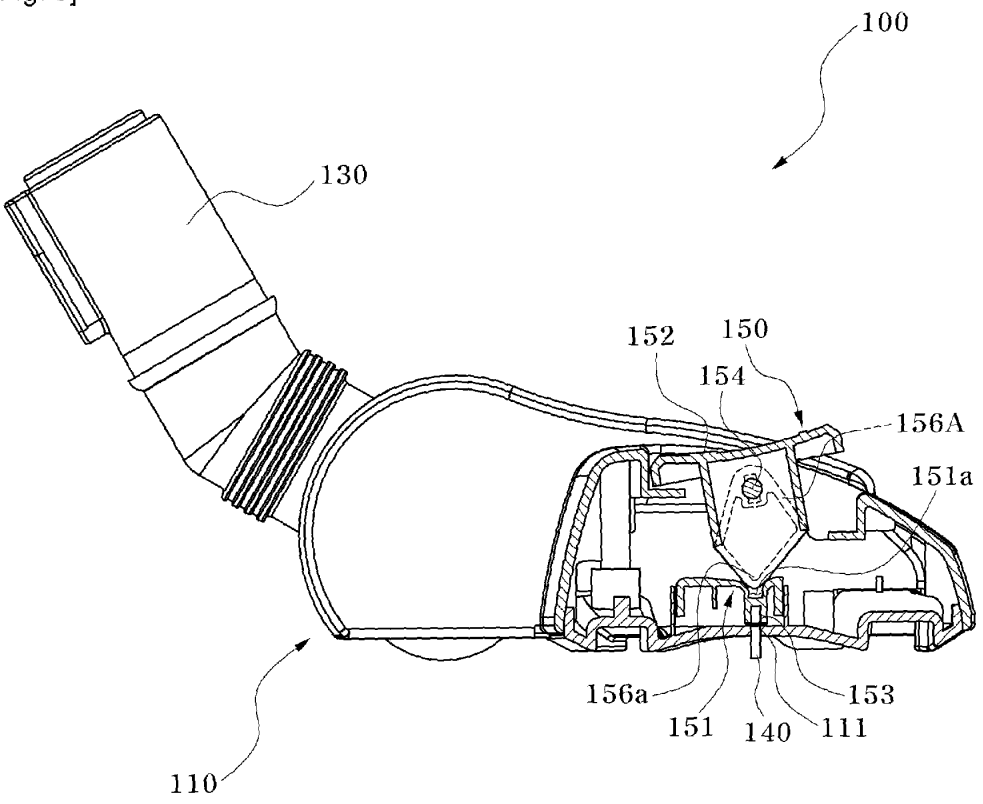
(54) SUCTION HEAD FOR A VACUUM CLEANER

(57) A suction head of a vacuum cleaner is disclosed. The suction head includes a housing forming an external appearance, a plurality of suction holes formed in the bottom of the housing, and a sweeper disposed between the suction holes.

[Fig. 8]



EP 2 311 357 A1

Description

[Technical Field]

[0001] The present invention relates to a suction head, and more particularly, to a suction head of a vacuum cleaner for effectively suction dust and foreign matter on a floor regardless of forward and backward movement of the suction head.

[Background Art]

[0002] In general, a vacuum cleaner is configured to collect dust and foreign matter on a floor with powerful suction force generated when a motor is driven.

[0003] FIG. 1 is a perspective view illustrating an existing vacuum cleaner and FIG. 2 is a bottom view illustrating a suction head of FIG. 1.

[0004] Referring to FIG. 1, the existing vacuum cleaner includes a main body 2 in which a motor generating a suction force is installed, a connector hose 4 communicated with the inside of the main body 2 and made of a flexible material, an extension pipe 6 connected to the connector hose 4 and adjustable in length, and a suction head 8 detachably mounted to an end of the extension pipe 6 to suction foreign matter on a floor.

[0005] In the main body 2, a filter device is installed to filter foreign matter contained in suctioned air.

[0006] A grip 5 is installed to an upper end of the extension pipe 6 and the grip 5 includes a manipulation button 5a for operating the vacuum cleaner.

[0007] The suction head 8, as illustrated in FIG. 2, includes a suction hole 8a formed in the bottom and a sweeper 8b provided at a rear side of the suction hole 8a. The suction head 8 suctions dust and foreign matter on a floor through the suction hole 8a and the sweeper 8b dusts particles and foreign matters on the floor.

[Disclosure of Invention]

[Technical Problem]

[0008] According to the existing vacuum cleaner, since a path through which dust and foreign matter are suctioned from a floor is blocked by the sweeper when the suction head is moved backward, dust and foreign matter are not easily suctioned from the floor and cleaning efficiency is inferior.

[0009] Thus, demands for solving the problem are required.

[0010] Therefore, the present invention has been made in view of the above problems, and the present invention provides a suction head of a vacuum cleaner for effectively suctioning dust and foreign matter from a floor regardless of forward and backward movements of the suction head.

[Technical Solution]

[0011] In accordance with the aspects of the present invention, there is a provided a suction head of a vacuum cleaner including: a housing forming an external appearance; a plurality of suction holes formed in the bottom of the housing; and a sweeper disposed between the suction holes.

[0012] The suction holes include a first suction hole formed in front of the sweeper and a second suction hole formed at the rear side of the sweeper.

[0013] The suction head further includes a manipulation unit projecting the sweeper out of the housing, and a projection hole through which the sweeper projects is formed in the bottom of the housing.

[0014] The manipulation unit includes a mounting member installed in the housing and to which the sweeper is mounted, a plurality of pressing members pressing the mounting member, a connector rod connecting the pressing members to each other, and a knob coupled with the pressing members and rotating the pressing members.

[0015] The suction head further includes an elastic member disposed between a lower side of the mounting member and an inner surface of the housing.

[0016] The knob is exposed over the upper side of the housing.

[0017] The pressing members rotate about the connector rod when the knob rotates.

[0018] The pressing members include V-shaped protrusions formed on the lower sides respectively and the mounting member has seat recesses, formed in an upper surface, on which the protrusions seat.

[0019] Moreover, the pressing members include a first pressing member disposed at a left side of the housing and a second pressing member disposed at a right side of the housing, the connector rod connects a side of the first pressing member to a side of the second pressing member, and the knob is coupled with the first pressing member.

[Advantageous Effects]

[0020] According to the suction head of a vacuum cleaner of the present invention, since suction holes are formed at the front and rear sides of the sweeper, a user may perform cleaning more easily and effectively while moving the suction head forward and backward.

[0021] Since the sweeper may be projected and returned back only by manipulating the knob, user convenience may be enhanced.

[0022] Moreover, the sweeper may be projected out of the housing whenever a user wants, various cleaning options may be selected.

[Brief Description of Drawings]

[0023] The above and other objects, features and other

advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view illustrating an existing vacuum cleaner;
FIG. 2 is a bottom view illustrating a suction head of FIG. 1;
FIG. 3 is a perspective view illustrating a suction head according to an embodiment of the present invention;
FIG. 4 is a bottom view illustrating the suction head of FIG. 3;
FIG. 5 is a side sectional view taken along the line A-A of FIG. 3;

[Best Mode for Carrying Out the Invention]

[0024] Hereinafter, a suction head of a vacuum cleaner according to embodiments of the present invention will be described in detail with reference to the accompanying drawings. Lines and some elements may be exaggerated in thickness and size for convenient illustration. Particular terms may be defined to describe the invention in the best manner. Accordingly, the meaning of specific terms or words used in the specification and the claims should not be limited to the literal or commonly employed sense, but should be construed in accordance with the spirit of the invention. The description of the various embodiments is to be construed as exemplary only and does not describe every possible instance of the invention. Therefore, it should be understood that various changes may be made and equivalents may be substituted for elements of the invention.

[0025] FIG. 3 is a perspective view illustrating a suction head according to an embodiment of the present invention, FIG. 4 is a bottom view of the suction head of FIG. 3, and FIG. 5 is a side sectional view taken along the line A-A of FIG. 3.

[0026] Referring to FIGS. 3 to 5, a suction head 100 of a vacuum cleaner according to an embodiment of the present invention includes a housing 110 and a suction duct unit 120.

[0027] The housing 110 forms an outer appearance of the suction head 100 of a vacuum cleaner. The housing 110 has a plurality of suction holes formed in the bottom such as a fist suction hole 112 and a second suction hole 114. In this embodiment of the present invention, although the two suction holes are formed in the suction head, the present invention is not limited thereto and three more suction holes may be formed.

[0028] The suction duct unit 120 is provided in the housing 110. The suction duct unit 120 includes a main duct 122 and a first suction port 124 and a second suction port 126 which are branched from the main duct 122.

[0029] The main duct 122 communicates with a connector 130. The connector 130 is connected to an extension pipe (not shown) communicated with a main body (not shown) of the vacuum cleaner.

[0030] The first suction port 124 communicates with a first suction hole 112 formed in the bottom of the housing 110 and the second suction port 126 communicates with a second suction hole 114 spaced apart from the first suction hole 112. Thus, the first suction port 124 communicates with the outside of the housing 110 through the first suction hole 112 and the second suction port 126 communicates with the outside of the housing 110 through the second suction port 114.

[0031] The housing 110 includes a sweeper 140. The sweeper 140 is disposed between the first suction hole 112 and the second suction hole 114. That is, with respect to the sweeper 140, the first suction hole 112 is disposed in front of the suction head 100 and the second suction hole 114 is disposed at the rear side of the suction head 100.

[0032] Hereinafter, operating principle of the suction head 100 of a vacuum cleaner according to the embodiment of the present invention will be described.

[0033] When a user performs cleaning with a vacuum cleaner having the suction head 100 according to the embodiment of the present invention, a suctioning force generated from the main body of the vacuum cleaner is transmitted to the suction head 100. The suction head 100 suctions dust and foreign matter on a site to be cleaned such as a floor with the suctioning force.

[0034] When the suction head 100 is moved forward while the cleaning is performed, since the first suction hole 112 is positioned in front of the suction head 100 in comparison with the sweeper 140, dust and other foreign matter on the floor in front of the suction head 100 are suctioned through the first suction hole 112 before being caught by the sweeper 140. Thus, dust may be effectively suctioned through the first suction hole 112.

[0035] On the contrary, when the suction head 100 is moved backward while the cleaning is performed, since the second suction hole 114 is positioned behind the suction head 100 in comparison with the sweeper 140, dust and other foreign matter on the floor behind the suction head 100 are suctioned through the second suction hole 114 before being caught by the sweeper 140. Thus, dust may be effectively suctioned through the second suction hole 114.

[0036] FIG. 6 is a perspective view illustrating the suction head an upper portion of which is cut off. FIG. 7 is a side sectional view taken along the line B-B of FIG. 3. FIG. 8 is a side sectional view illustrating a knob of FIG. 7 rotated in a direction.

[0037] Referring to FIGS. 6 to 8, the sweeper 140 is configured to project out of the housing 110 and the projection of the sweeper 140 is performed by a manipulation unit 150. The manipulation unit 150 includes a mounting member 151, pressing members 156A and 156B, a connector rod 154, and a knob 152.

[0038] The mounting member 151 is installed in the housing 110 and mounted to the lower side of the sweeper 140. An elastic member 153 is disposed between the

mounting member 151 and the housing 110. The elastic member 153 is configured such that an end is coupled to the lower surface of the mounting member 151 and the opposite end is coupled to the upper surface of the housing 110 to elastically support the mounting member 151. The mounting member 151 has seat recesses 151a formed on the upper side and later-described protrusions 156a seat in the seat recesses 151 a.

[0039] The pressing members 156A and 156B press the mounting member 151 such that the sweeper 140 projects out of the housing 110. At this time, the sweeper 140 projects out of the housing 110 through a projection hole 111 formed in the bottom of the housing 110. The pressing members 156A and 156B have a diamond-shaped section and have V-shaped protrusions 156a formed on the lower sides respectively. The protrusions 156a seat in the seat recesses 151a of the mounting member 151 when the knob 151 rotates and transmits a pressing force to the sweeper 140 continuously.

[0040] The pressing members 156A and 156B are plural and in this embodiment include a first pressing member 156A disposed at the left side of the housing 110 and a second pressing member 156B disposed at the right side of the housing 110. The pressing members 156A and 156B are provided at both sides of the sweeper 150 to push both sides of the sweeper 140 evenly during the rotation of the knob 152. Thus, the sweeper 140 projects out of the housing 110 without leaning against any one side.

[0041] A side of the first pressing member 156A is connected to a side of the second pressing member 156B by the connector rod 154 and the first pressing member 156A is coupled with the knob 152. Thus, the first pressing member 156A rotates during the rotation of the knob 152 and a rotational force is transmitted to the second pressing member 156B via the connector rod 154 so that the second pressing member 156B rotates by the same angle in the same direction as that of the first pressing member 156A. By doing so, even when only a single knob 152 is manipulated, the two right and left pressing members 156a and 156B rotate.

[0042] The connector rod 154 connects the first pressing member 156A to the second pressing member 156B. Due to this connection, when the first pressing member 156A rotates, the second pressing member 156B also rotates simultaneously. The connector rod 154 may be supported by an internal structure of the housing 110 such that the connector rod 154 serves as a rotation center of the pressing members 156A and 156B when the knob 152 rotates. Thus, when a user rotates the knob 152, the first pressing member 156A coupled with the knob 152 rotates about the connector rod 154.

[0043] The knob 152 is installed to the housing 110 to rotate and is exposed over the upper surface of the housing 110 such that a user easily rotates the knob 152. The knob 152, as an exemplary embodiment, is coupled with the first pressing member 156A disposed at the left side of the housing 110 and may be coupled with the second pressing member 156B disposed at the right side of the housing 110.

[0044] Hereinafter, the principle that the sweeper 140 projects out of the housing 110 in the suction head 100 of a vacuum cleaner according to the embodiment of the present invention will be described.

[0045] As illustrated in FIG. 7, when a user presses the knob 152 in a direction in the state where the sweeper 140 is inserted into the housing 110, the knob 152 and the first pressing member 156A, as illustrated in FIG. 8, rotate about the connector rod 154. At this time, the second pressing member 156B connected to the first pressing member 156A by the connector rod 154 also rotates in the counterclockwise direction. Rotation brings the protrusions 156a of the pressing members 156A and 156B to seat in the seat recesses 151a of the mounting member 151 and the sweeper 140 projects out of the housing 110 through the projection hole 111 by the downward movement of the mounting member 151.

[0046] On the contrary, when a user presses the knob 152 in the opposite direction in order to return the sweeper 140 back into the housing 110, the protrusions 156a are separated from the seat recesses 151a and the pressing members 156A and 156B rotate in the clockwise direction. At this time, since the force pressing the mounting member 151 is dissipated by the rotations of the pressing members 156A and 156B, the mounting member 151 moves upward by a restoring force of the elastic member 153 and the sweeper 140 returns back into the housing 110.

[0047] Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, and that the suction head is applied to a vacuum cleaner and other products, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A suction head of a vacuum cleaner comprising:

   a housing forming an external appearance;
   a plurality of suction holes formed in the bottom of the housing; and
   a sweeper disposed between the suction holes.

2. The suction head as claimed in claim 1, wherein the suction holes include:

   a first suction hole formed in front of the sweeper; and
   a second suction hole formed at the rear side of the sweeper.

3. The suction head as claimed in claim 1, further com-

prising a manipulation unit projecting the sweeper out of the housing,
wherein a projection hole through which the sweeper projects is formed in the bottom of the housing.

4. The suction head as claimed in claim 3, wherein the manipulation unit comprises:

a mounting member installed in the housing and to which the sweeper is mounted;
a plurality of pressing members pressing the mounting member;
a connector rod connecting the pressing members to each other; and
a knob coupled with the pressing members and rotating the pressing members.

5. The suction head as claimed in claim 4, further comprising an elastic member disposed between a lower side of the mounting member and an inner surface of the housing.

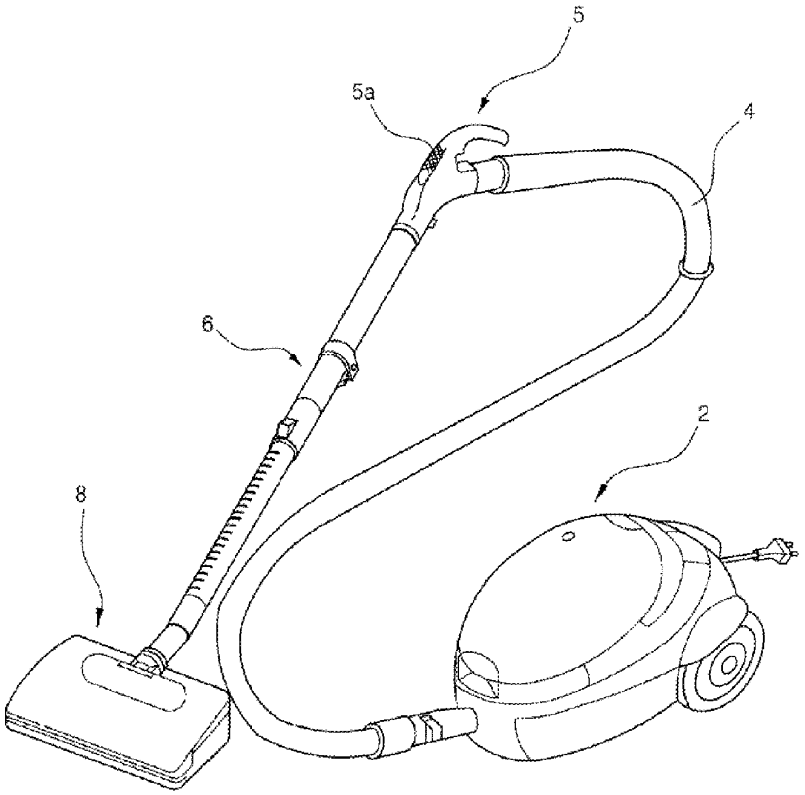
6. The suction head as claimed in claim 4, wherein the knob is exposed over the upper side of the housing.

7. The suction head as claimed in claim 4, wherein the pressing members rotate about the connector rod when the knob rotates.

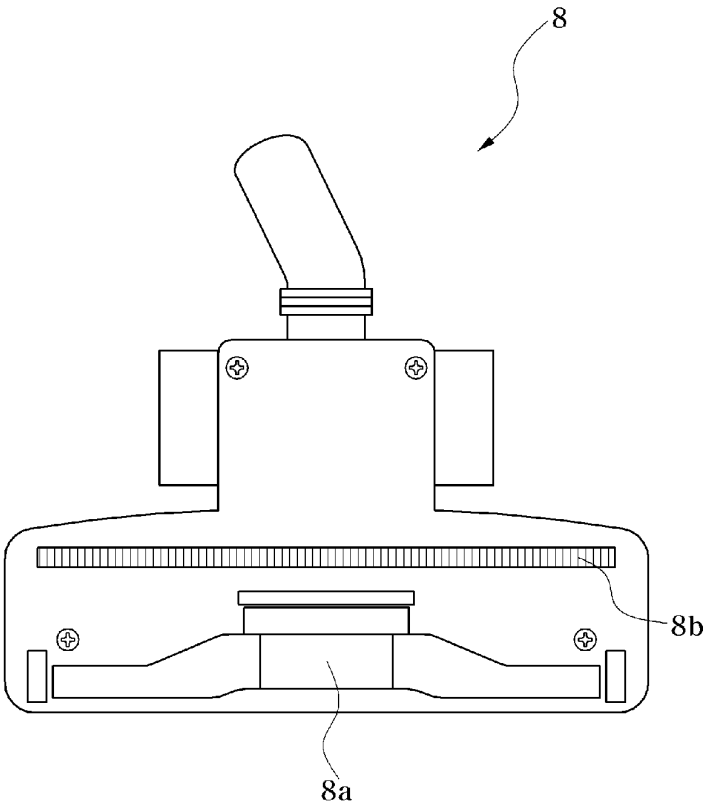
8. The suction head as claimed in claim 4, wherein the pressing members include V-shaped protrusions formed on the lower sides respectively and the mounting member has seat recesses, formed in an upper surface, on which the protrusions seat.

9. The suction head as claimed in claim 4, wherein the pressing members comprise a first pressing member disposed at a left side of the housing and a second pressing member disposed at a right side of the housing;
the connector rod connects a side of the first pressing member to a side of the second pressing member; and
the knob is coupled with the first pressing member.

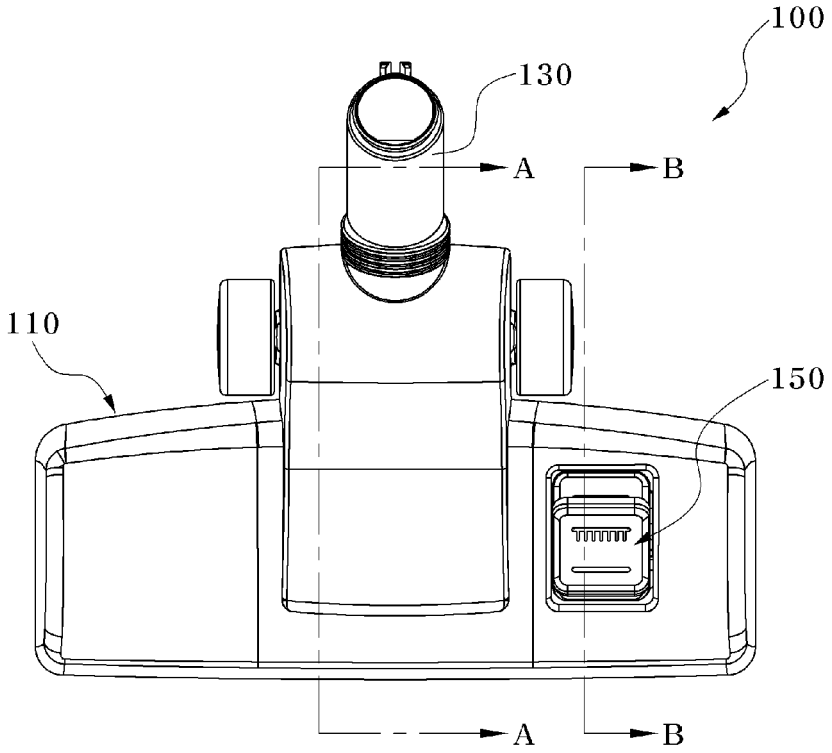
[Fig. 1]



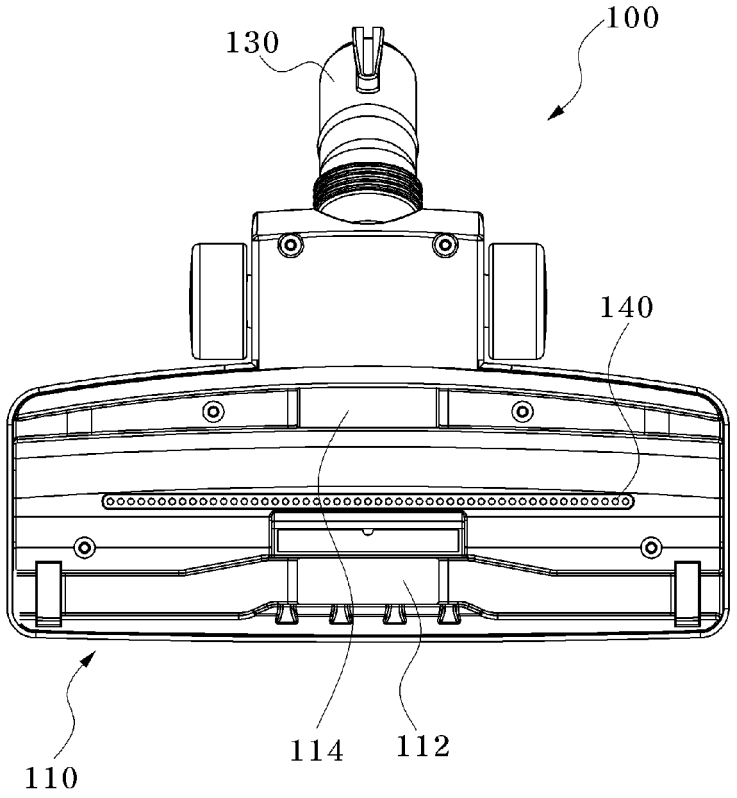
[Fig. 2]



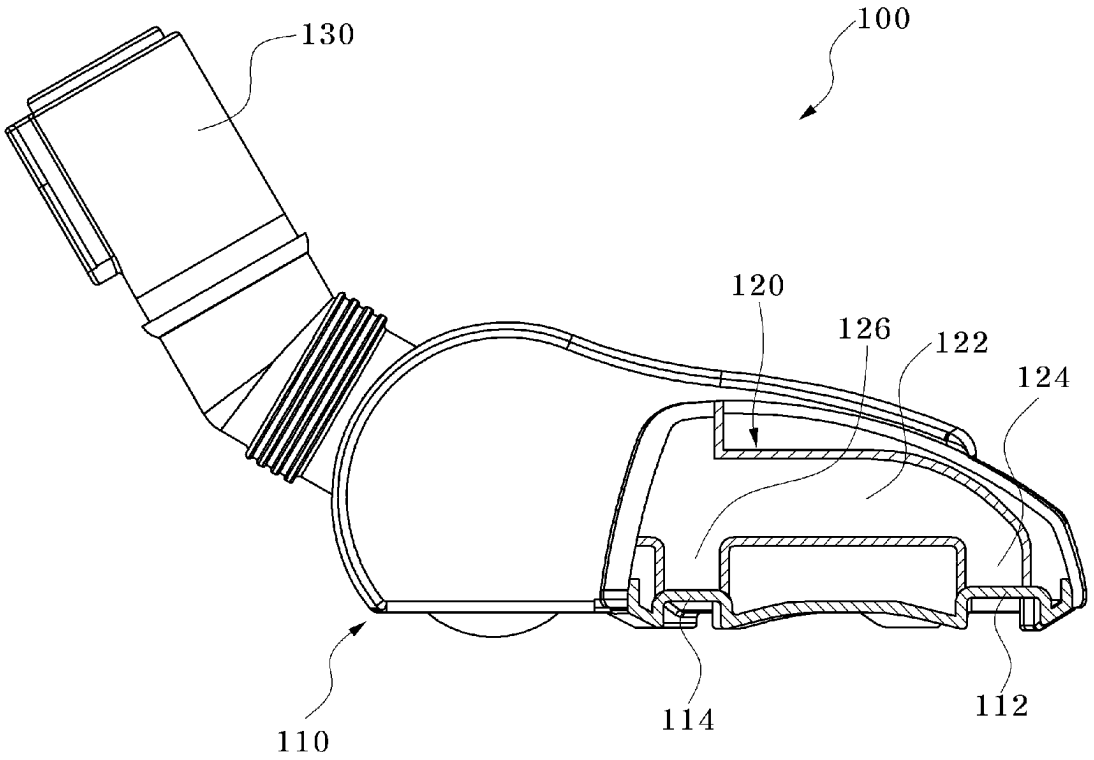
[Fig. 3]



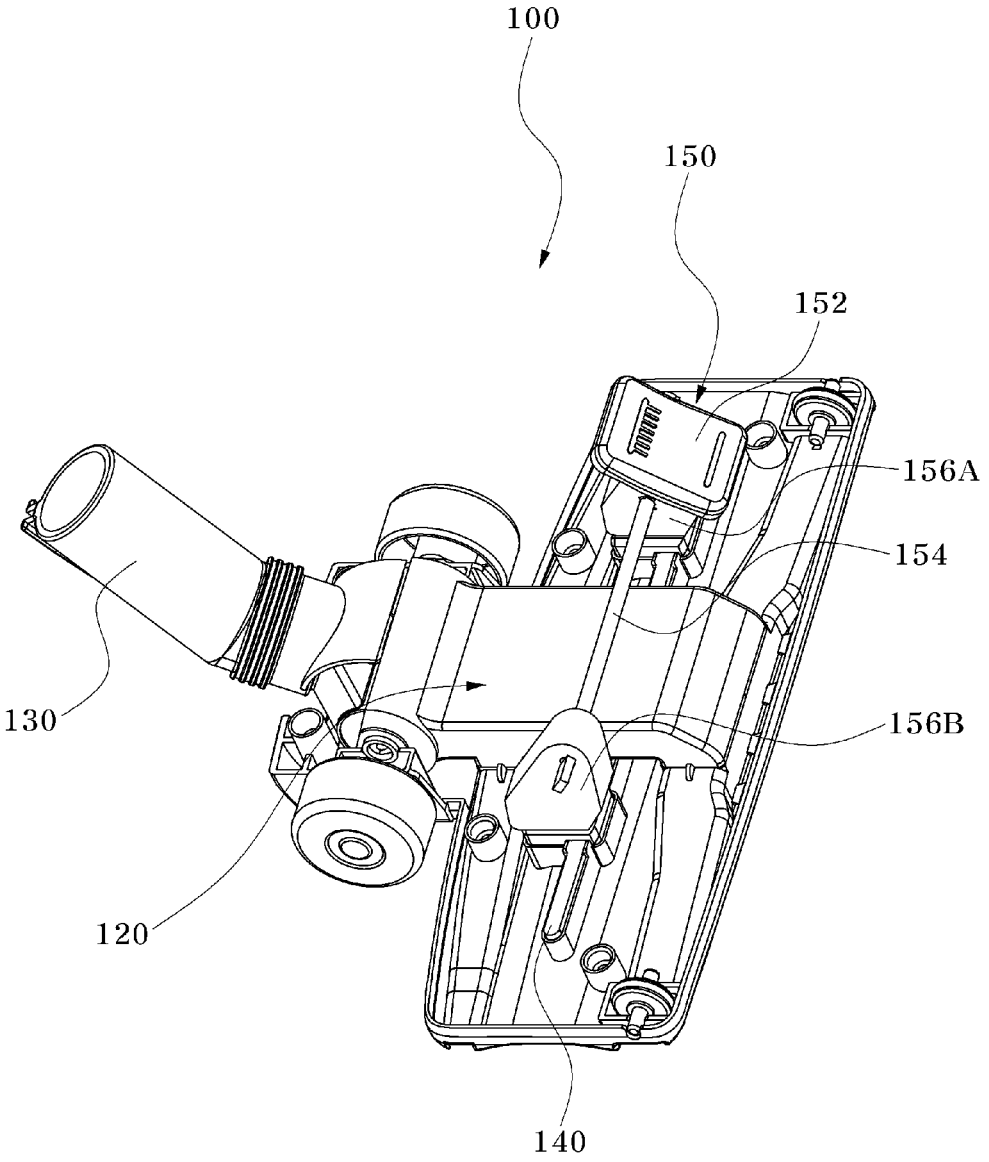
[Fig. 4]



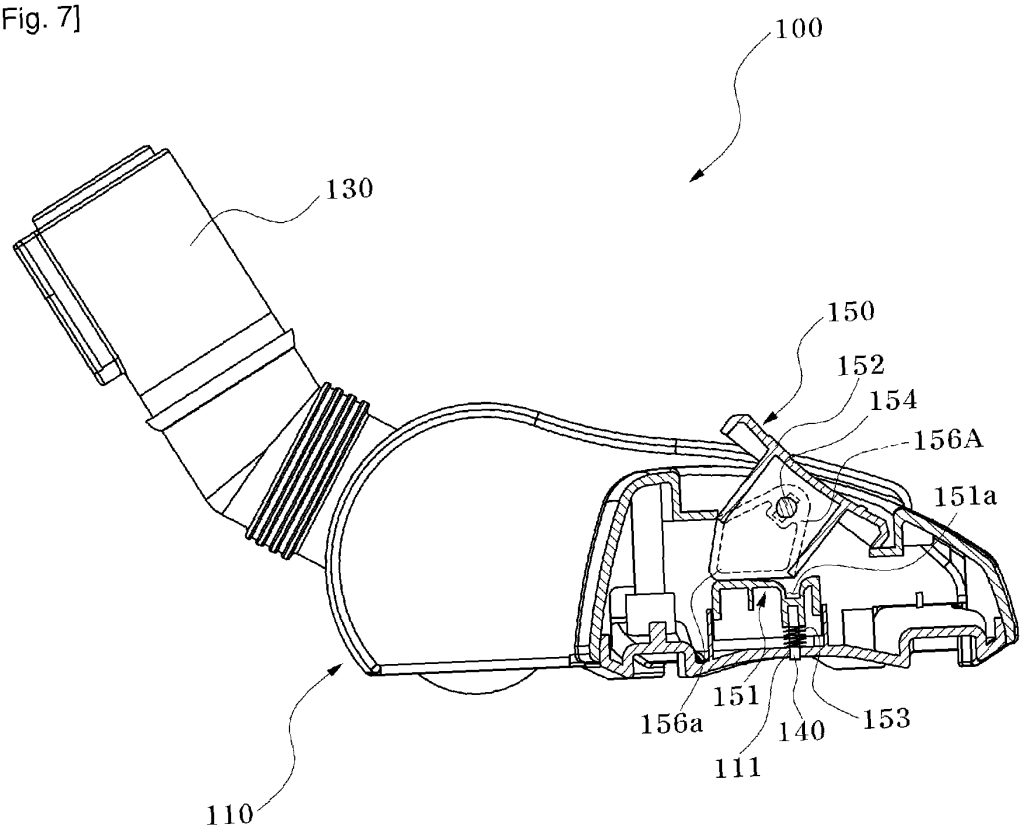
[Fig. 5]



[Fig. 6]



[Fig. 7]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151a
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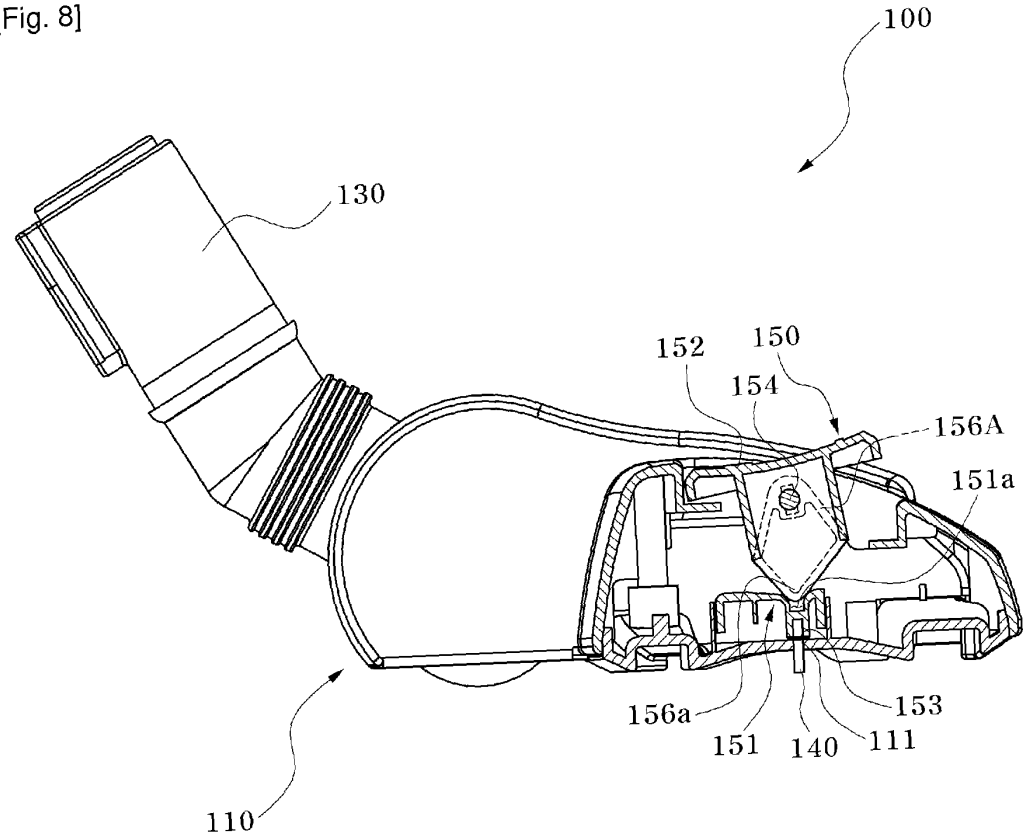
153
111
110

[Fig. 8]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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2009/003476

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC A47L 9/00; A47L 9/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) Keywords: "cleaner, suction port, sweeper and squeeze"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2004-0050217 A (LG ELECTRONICS INC.) 16 JUN. 2004 See the entire document	1 - 9
A	KR 10-1997-0032675 A (LG ELECTRONICS INC.) 22 JUL. 1997 See the entire document	1 - 9
A	KR 10-2001-0047077 A (LG ELECTRONICS INC.) 15 JUN. 2001 See the entire document	1 - 9
A	JP 2006-346279 A (TOSHIBA TEC CORP.) 28 DEC 2006 paragraph 77 - paragraph 64; figures 1, 2	1 - 9
A	US 2008-0072398 A1 (SANSUNG GWANGJU ELECTRONICS CO., LTD.) 27 MAR. 2008 paragraph 27 - paragraph 47; figure 2	1 - 9

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 NOVEMBER 2009 (19.11.2009)	**19 NOVEMBER 2009 (19.11.2009)**
Name and mailing address of the ISA/ Korean Intellectual Property Office Government Complex-Daejeon, 139 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2008)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2009/003476

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Form PCT/ISA/210 (patent family annex) (July 2008)