



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.05.2024 Bulletin 2024/22

(51) International Patent Classification (IPC):
A47L 9/04 ^(2006.01) **A47L 9/06** ^(2006.01)

(21) Application number: **22209468.2**

(52) Cooperative Patent Classification (CPC):
A47L 9/0606; A47L 9/0483

(22) Date of filing: **24.11.2022**

(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 ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(71) Applicant: **Jang, Jin Tae**
Paju-si 10858 (KR)

(72) Inventor: **Jang, Jin Tae**
Paju-si 10858 (KR)

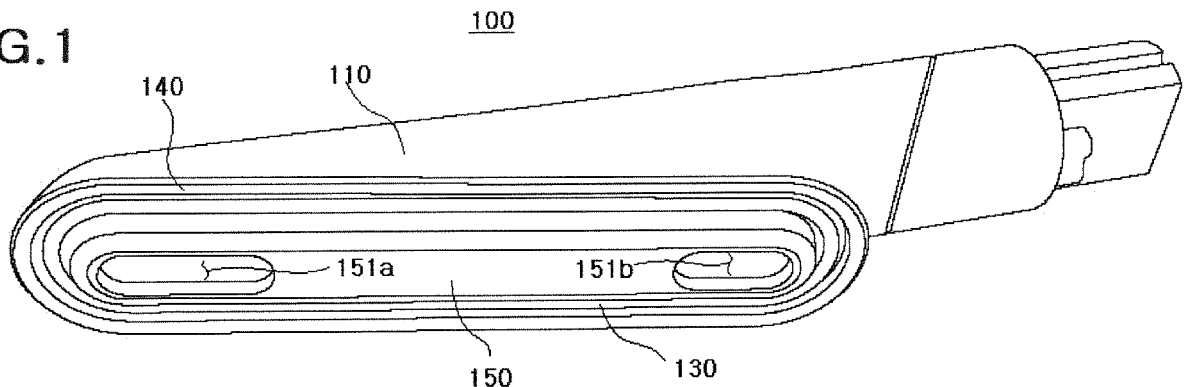
(74) Representative: **Casalonga**
Casalonga & Partners
Bayerstraße 71/73
80335 München (DE)

(54) **CLEANER HEAD**

(57) A cleaner head includes a housing part having an opening opened downwardly, a vibration generating part disposed to cover the opening, and having at least one inlet passing through an inhaling force to generate

a vibration force, and a vibration isolating part disposed around the housing part, and separating the vibration generated by the vibration generating part from the housing part.

FIG. 1



Description

BACKGROUND

1. Technical Field

[0001] Example embodiments relate generally to a cleaner head. More particularly, the inventive concept uses a cleaner head detachably provided on a hose part of a vacuum cleaner.

2. Description of the Related Art

[0002] Dust or foreign substances may remain on a surface such as a floor, a carpet, a shelf, etc. for a long time. In this case, the dust or the foreign substances may be attached to the surface at a high energy state such as static electricity, and the attached dust or foreign substances may not be readily removed.

[0003] In order to solve the above problem, a vacuum cleaner may have a brush part adjacent to an inlet. Here, a user may directly control the brush part, and the attached dust or foreign substances may be separated from the surface. The separated dust or foreign substances may be inhaled by a vacuum force from the surface.

[0004] Meanwhile, in order to effectively separate and inhale the foreign substances or dust from the surface, the head part included in the vacuum cleaner may include a vibration body.

[0005] However, when the brush part vibrates, the vibration is transmitted to a housing part covering the brush part and a handle part connected to the housing part. Thus, a user gripping the handle part may feel fatigue by the vibration and cause a vibration syndrome. Further, the vibration may be transmitted to the brush part and the housing part covering the brush part, and the loss of the vibration may be generated.

[0006] Meanwhile, an additional power source is required to vibrate the brush. In this case, a vibration generating part for applying the vibration to the brush part included in the cleaner head is electrically connected to a main body of the cleaner. Thus, a connection structure for electrically connecting the cleaner head and the cleaner body may be additionally required, and a wireless cleaner may have a complex structure and heavy weight.

SUMMARY

[0007] Some example embodiments provide a cleaner head capable of transmitting vibration to a brush part.

[0008] Also, some example embodiments provide a cleaner head capable of transmitting an electric power to a brush part through an internal power source.

[0009] According to some example embodiments, a cleaner head includes a housing part having an opening opened downwardly, a vibration generating part disposed to cover the opening, and having at least one inlet passing through an inhaling force to generate a vibration

force, and a vibration isolating part disposed around the housing part, and separating the vibration generated by the vibration generating part from the housing part.

[0010] In an embodiment, the vibration isolating part may be interposed between the housing part and the vibration generating part.

[0011] In an embodiment, the vibration isolating part may have a closed curve shape along a lower surface of the housing in a plan view.

[0012] In an embodiment, the vibration isolating part may include rubber or high polymer.

[0013] In an embodiment, the vibration isolating part may have a U-shaped vertical cross-section.

[0014] In an embodiment, the vibration generating part may include a vibration plate covering the opening and having the inlet, an oscillator disposed on the vibration plate, and a motor connected to the oscillator by a link on the vibration plate to provide a driving force to the oscillator.

[0015] Here, the vibration plate may have a pair of inlets having different areas from each other.

[0016] In an embodiment, the cleaner head may further include a first coupling member fixing the vibration isolating part to a lower surface of the housing part.

[0017] Here, the first coupling member may include a hook.

[0018] In an embodiment, the cleaner head may further include a handle part configured to be connected to an upper portion of the housing part and including a flow path formed therein.

[0019] Here, the handle part may further include a battery provided therein and supplying an electric power to the vibration generating part, and a controller controlling a power supply from the battery to the vibration generating part.

[0020] Here, the handle part may further include a sensor configured to sense a pressure in the flow path to provide a pressure signal to the controller.

[0021] Meanwhile, the handle part may further include a second connecting part having an end portion connected to an extension hose.

[0022] Also, the housing part may include a housing body having the opening, and a connector connecting the housing body and the handle part.

[0023] Here, the connector may be rotatably connected to the handle part along an inclined direction with respect to an extension direction of the housing body.

[0024] In an embodiment, the cleaner head may further include a brush part disposed under the vibration generating part, and being configured to receive the vibration force to vibrate.

[0025] In an embodiment, the cleaner head may further include a protrusion part disposed under the vibration generating part, and being configured to receive the vibration force to vibrate.

[0026] According to the embodiments of the inventive concept, the vibration isolating part may prevent the transmission of the vibration generated from the vibration

generating part to the housing part, and the transmission of the vibration to the handle part through the housing part may be prevented. Also, the vibration isolating part may selectively transmit the vibration from the vibration generating part to the brush part, and the vibration may be effectively transmitted to the brush part.

[0027] Meanwhile, the housing part includes a battery inside thereof, and may supply the power to the vibration generating part by itself. Thus, an outer power source for driving the vibration generating part is omitted, and the cleaner head may generate the vibration by an internal power source.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Illustrative, non-limiting example embodiments will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings.

FIG. 1 is a perspective view illustrating a cleaner head according to an embodiment of the inventive concept.

FIG. 2 is a front view illustrating the cleaner head of FIG. 1.

FIG. 3 is a partial cross-sectional view illustrating a connection between the vibration isolating part and a housing part of FIG. 2.

FIG. 4 is a perspective view illustrating a connection between the cleaner head of FIG. 1 and a hose part using a handle part.

FIG. 5 is a block diagram illustrating operation of a battery included in the handle part of FIG. 4.

FIG. 6 is a perspective view illustrating a cleaner head according to another embodiment of the inventive concept.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0029] Hereinafter, exemplary embodiments of the inventive concept will be described in detail with reference to the accompanying drawings. It will be understood that the inventive concept may be embodied in many alternative forms and should not be construed as limited to the example embodiments set forth herein. While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof are shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that there is no intent to limit the invention to the particular forms disclosed, but on the contrary, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention. In describing each drawing, like numerals are used for like elements. In the enclosed drawings, the sizes and relative sizes of layers and regions may be exaggerated for clarity.

[0030] It will be understood that, although the terms

first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are used to distinguish one element from another. For example, a first element discussed below could be termed a second element without departing from the teachings of the present inventive concept. Also, a second element discussed below could be termed a first element without departing from the teachings of the present inventive concept.

[0031] The terms used in the inventive concept are only used to describe particular embodiments, and it is not intended to limit the inventive concept. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0032] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this inventive concept belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0033] FIG. 1 is a perspective view illustrating a cleaner head according to an embodiment of the inventive concept. FIG. 2 is a front view illustrating the cleaner head of FIG. 1. FIG. 3 is a partial cross-sectional view illustrating a connection between the vibration isolating part and a housing part of FIG. 2.

[0034] Referring to FIGS. 1 to 3, the cleaner head 100 according to the embodiment of the inventive concept includes a housing part 110, a vibration generating part 150, and a vibration isolating part 130. The cleaner head 100 may be detachably connected to a hose 210 (shown in FIG. 4) of a cleaner main body (not shown).

[0035] The housing part 110 includes an opening opened toward a lower portion thereof. A first flow path configured to transmit a vacuum force is formed in the housing part 110. The first flow path is coupled with the opening. The housing part 110 is provided to cover the vibration generating part 150.

[0036] The housing part 110 may have a rod shape. The housing part 110 may include a high polymer material such as PET.

[0037] The vibration generating part 150 may be disposed to cover the housing part 110. The vibration generating part 150 may have a shape corresponding to a shape of the opening. For example, when the opening has an elliptical shape, the vibration generating part 150 may also have an elliptical shape in a plan view.

[0038] The vibration generating part 150 generates a vibration force. The vibration generating part 150 may include at least one inlet 151a and 151b. The inlet 151a and 151b may be implemented as a flow path for transmitting the vacuum force by the connection with the first flow path. The vibration generating part 150 may be provided to transmit the vibration force to the brush part 160. In particular, the vibration force generated by the vibration generating part 150 may not be transmitted to the housing part 110 by the vibration isolating part 130, but be selectively transmitted to the brush part 160.

[0039] In an example embodiment, a brush part 160 (shown in FIG. 4) may be further disposed under the vibration generating part 150. The brush part 160 may vibrate by the transmission of the vibration force from the vibration generating part 150. Thus, since the brush part 160 vibrates, the dust or foreign substances attached on a surface may be readily removed.

[0040] In another example embodiment, a protrusion part 165 (shown in FIG. 6) may be further disposed under the vibration generating part 150. The protrusion part 165 may vibrate by the transmission of the vibration force from the vibration generating part 150. Thus, since the protrusion part 165 vibrates, the dust or foreign substances attached on a surface of fabric textile may be readily removed.

[0041] The vibration isolating part 130 is disposed around the housing part 110. Also, the vibration isolating part 130 may be disposed around an outer periphery or the opening of the housing part 110. The vibration isolating part 130 may vibrationally separate the housing part 110 from the vibration generating part 150. Thus, the vibration isolating part 130 may prevent the transmission of the vibration generated from the vibration generating part 150 toward the housing part 110. Therefore, since the vibration isolating part 130 prevents the transmission of the vibration force generated from the vibration generating part 150 to the housing part 110, the vibration force may be selectively transmitted to the brush part 160.

[0042] The vibration isolating part 130 may be interposed between the housing part 110 and the vibration generating part 150. For example, the vibration isolating part 130 may be arranged along a boundary between the housing part 110 and the vibration generating part 150. Thus, the vibration isolating part 130 may vibrationally separate the entire of the housing part 110 from the vibration generating part 150.

[0043] The vibration isolating part 130 may have a closed curve shape along a lower surface of the housing part 110 in a plan view. Also, when the opening has an elliptical shape, the vibration isolating part 130 may have an elliptical shape in a plan view.

[0044] The vibration isolating part 130 may include an elastic material such as a rubber material or a high polymer resin material. Thus, the vibration isolating part 130 may effectively separate the vibration generated from the vibration generating part 150 from the housing part 110.

[0045] The vibration isolating part 130 may have a "U-

shaped" vertical cross-sectional shape. Thus, the vibration isolating part 130 may buffer the vibration force and may elastically recover a shape thereof. Therefore, the vibration isolating part 130 may effectively separate the vibration generated from the vibration generating part 150.

[0046] According to an embodiment of the inventive concept, the vibration generating part 150 may include a vibration plate 151, an oscillator 153, and a motor 155.

[0047] The vibration plate 151 covers the opening. When the opening has the elliptical shape, the vibration plate 151 may also have an elliptical shape. The vibration plate 151 is provided to support the oscillator 153 and the motor 155. Since the vibration plate 151 vibrates, the brush part 160 attached to the vibration plate 151 may vibrate together with the vibration plate 151.

[0048] Meanwhile, an inlet 151a and 151b may be formed on the vibration plate 151. The inlet 151a and 151b may be coupled with the first flow path formed through the housing part 110. Thus, the cleaner head 100 may inhale the foreign substances or the dust through the inlet 151a and 151b using an inhaling force transmitted through the first flow path.

[0049] The oscillator 153 is disposed on the vibration plate 151. The oscillator 153 may periodically reciprocate in a vertical direction or a horizontal direction.

[0050] The motor 155 is link-connected to the oscillator 153 on the vibration plate 151. The motor 155 provides a driving force to the oscillator 151.

[0051] Since a link connecting the motor 155 and the oscillator 153 is eccentrically connected by a link, the oscillator 153 may vibrate according to the rotation of the motor 155. Thus, since the oscillator 153 vibrates, the vibration plate 151 supporting the oscillator 153 may vibrate together with the oscillator 153.

[0052] Meanwhile, the vibrating plate 151 may have a pair of inlets 151a and 151b having different areas from each other. A first inlet 151a is provided at a foremost side, and the second inlet 151b is provided at an opposite side. Here, the first inlet 151a may have an elliptical shape, and the second inlet 151b may have a substantially circular shape. Since the first and second inlets 151a and 151b have different areas from each other, air currents having different pressures are formed at the foremost side and the opposite side. Thus, the vacuum force transmitted from the first flow path may more effectively inhale the dust or foreign substances by the pressure difference.

[0053] According to an embodiment of the inventive concept, a coupling member 140 configured to fix the vibration isolating part 130 to a lower surface of the housing part 110 may be additionally provided. The coupling member 140 may include, for example, a hook. Since the hook is fitted between the housing part 110 and the vibration isolating part 130, the hook may fix the vibration isolating part 130 to the lower surface of the housing part 110.

[0054] Alternatively, the vibration isolating part 130

may be fixed to the lower surface of the housing part 110 through an ultrasonic fusion process.

[0055] FIG. 4 is a perspective view illustrating a connection between the cleaner head of FIG. 1 and a hose part using a handle part. FIG. 5 is a block diagram illustrating operation of a battery included in the handle part of FIG. 4.

[0056] Referring to FIGS. 1, 2, 4, and 5, the cleaner head 100 may further include a handle part 170.

[0057] The handle part 170 may be provided to be coupled with an upper portion of the housing part 110. The handle part 170 includes a second flow path inside thereof. The second flow path is coupled with the first flow path formed in the housing part 110. Thus, the vacuum force generated by the cleaner main body (not shown) may be transmitted to the first flow path through the second flow path. The handle part 170 may be hook connected to the upper portion of the housing part 110.

[0058] The housing part 110 may include a housing body 111 and a connector 118. The housing body 111 has the opening. The connector 118 connects the housing body 111 and the handle part 170.

[0059] The housing body 111 has a cylindrical shape having a space therein.

[0060] The connector 118 includes a first connecting part 119 configured to detachably connect the housing body 111 to the handle part 170. The first connecting part 119 may include a first button having elasticity. The first connecting part 119 may be elastically received or protruded from a hole formed on the handle part 110, and the connector 118 may be coupled with the handle part 170.

[0061] According to an embodiment of the inventive concept, the handle part 170 may include a battery 171 and a controller 173.

[0062] The battery 171 is provided inside thereof, and provides an electric power to the vibration generating part 150. The vibration generating part 150 included in the cleaner head 100 may be generated using the battery 171 by itself. Thus, an additional unit for providing an electric power to the vibration generating part 150 may be omitted. Therefore, the cleaner head 100 may generate the vibration force using the electric power by itself.

[0063] The controller 173 controls the power supply of the vibration generating part 150 from the battery 110.

[0064] For example, the handle part 170 further includes a sensor 175 configured to sense an internal pressure in the second flow path to provide a pressure signal to the controller 173. The sensor 175 may sense pressure change in the second flow path. For example, when the vacuum force is generated from the cleaner body connected to the cleaner head 100, a pressure may be changed in the second flow path. In this case, the sensor 175 senses the change of the pressure, and determine the operation of a vacuum generating part (not illustrated) included in the cleaner body. The sensor 175 may include, for example, a resonant pressure sensor or a piezoelectric pressure sensor.

[0065] The handle part 170 further includes a switch 177. When the sensor 175 senses a pressure variation, the sensed signal is transmitted to the controller 173. In this case, the controller 173 provides a control signal for controlling the switch 177, and switches the supply of the electric power between the battery 171 and the vibration generating part 150.

[0066] According to an embodiment of the inventive concept, the handle part 170 may further include a second connecting part 179 having an end portion coupled with an extension hose 210.

[0067] The second connecting part 179 may be, for example, a second button having elasticity. The second button may be elastically received and protruded from the hole formed through the hose 210, and the handle part 170 and the hose 210 may be coupled to each other.

[0068] According to an embodiment of the inventive concept, the connector 119 may be rotatably connected along an inclined direction with respect to an extension direction of the housing body 111, and may be provided to bend the housing body 111 with respect to the handle part 170. Thus, the housing part 110 has a bent structure with respect to the handle part 170, the brush part 160 connected to the housing part 110 may easily approach the surface on which the dust or the foreign substances are disposed. Thus, loss of the vacuum force may be decreased.

[0069] According to the above, the cleaner head may be mounted on various cleaner bodies. Also, the cleaner may have various shapes, and the cleaning process may be performed using the inhaling force generated from the cleaner body and the vibration force generated from the cleaner head.

[0070] Although preferred embodiments of the inventive concept have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions, and substitutions are possible, without departing from the scope and spirit of the disclosure as disclosed in the accompanying claims and their equivalents.

Claims

1. A cleaner head comprising:

a housing part having an opening opened downwardly;
a vibration generating part disposed to cover the opening, having at least one inlet passing through an inhaling force and being configured to generate a vibration force; and
a vibration isolation part disposed around the housing part, and being configured to vibrationally isolating the housing part from the vibration generating part.

2. The cleaner head of claim 1, wherein the vibration

isolating part is interposed between the housing part and the vibration generating part.

3. The cleaner head of claim 1, wherein the vibration isolating part has a closed curve shape along a lower surface of the housing in a plan view. 5
4. The cleaner head of claim 1, wherein the vibration isolating part comprises a rubber material or a high polymer resin material. 10
5. The cleaner head of claim 1, wherein the vibration isolating part has a U-shaped vertical cross-section.
6. The cleaner head of claim 1, wherein the vibration generating part comprises: 15
 - a vibration plate covering the opening and having the inlet;
 - an oscillator disposed on the vibration plate; and 20
 - a motor connected to the oscillator on the vibration plate by a link to provide a driving force to the oscillator.
7. The cleaner head of claim 6, wherein the vibration plate has a pair of inlets having different areas from each other. 25
8. The cleaner head of claim 1, further comprising a first coupling member fixing the vibration isolating part to a lower surface of the housing part. 30
9. The cleaner head of claim 1, further comprising a handle part configured to be connected to an upper portion of the housing part and having a flow path formed inside thereof. 35
10. The cleaner head of claim 9, wherein the handle part comprises: 40
 - a battery provided therein and being configured to supply an electric power to the vibration generating part; and
 - a controller controlling a power supply from the battery to the vibration generating part. 45
11. The cleaner head of claim 10, wherein the handle part further comprises a sensor configured to sense a pressure in the flow path to provide a pressure signal to the controller. 50
12. The cleaner head of claim 9, wherein the housing part comprises:
 - a housing body having the opening; and 55
 - a connector connecting the housing body and the handle part to each other.

13. The cleaner head of claim 12, wherein the connector is rotatably connected to the handle part along an inclined direction with respect to an extension direction of the housing body.

14. The cleaner head of claim 1, further comprising a brush part disposed under the vibration generating part, and being configured to receive the vibration force to vibrate.

15. The cleaner head of claim 1, further comprising a protrusion part disposed under the vibration generating part, and being configured to receive the vibration force to vibrate.

FIG.1

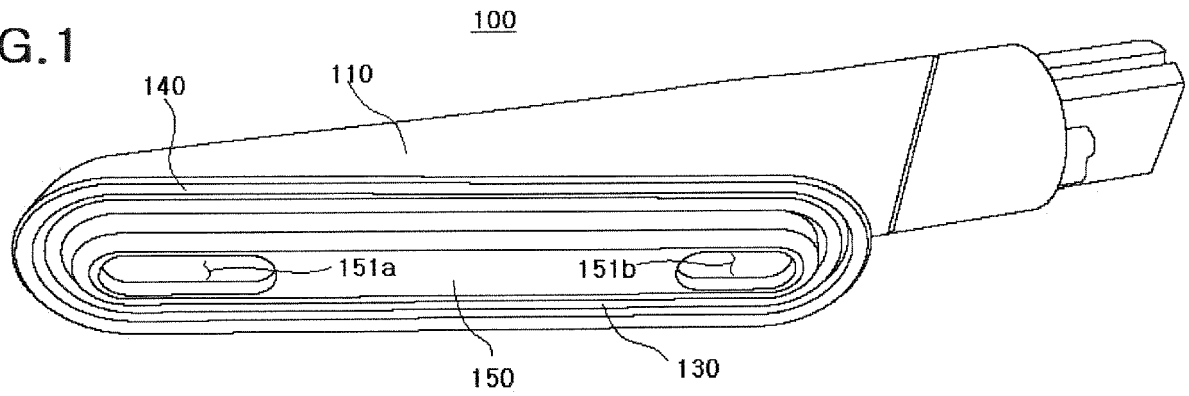


FIG.2

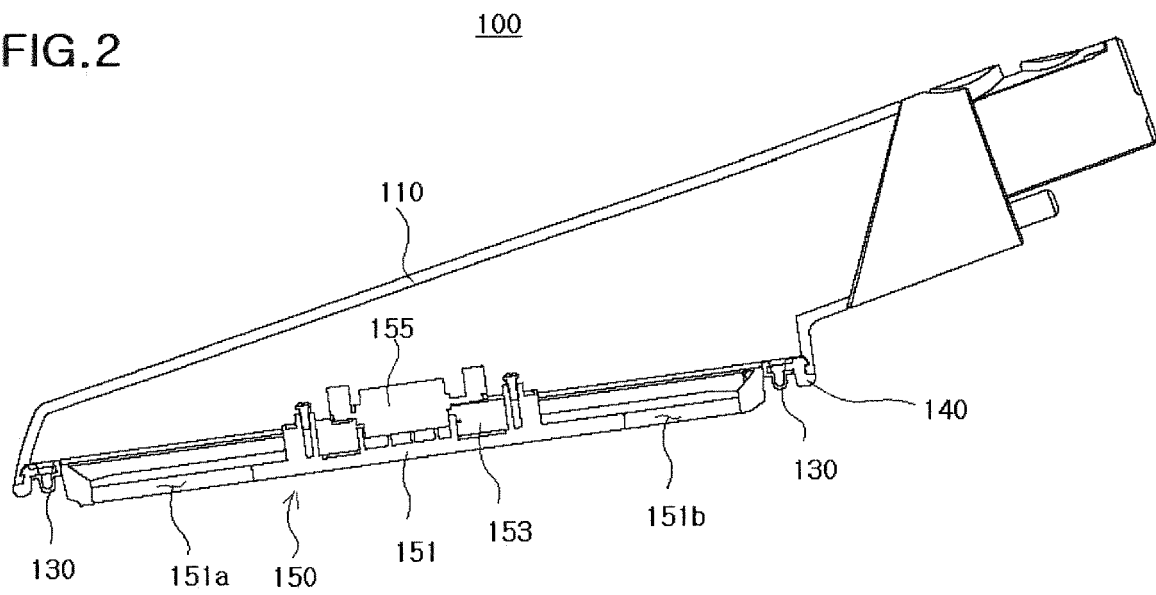


FIG.3

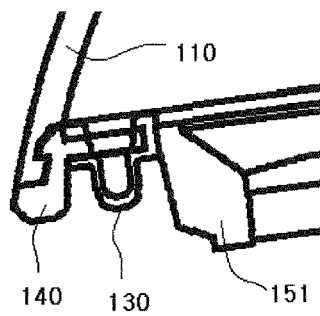


FIG.4

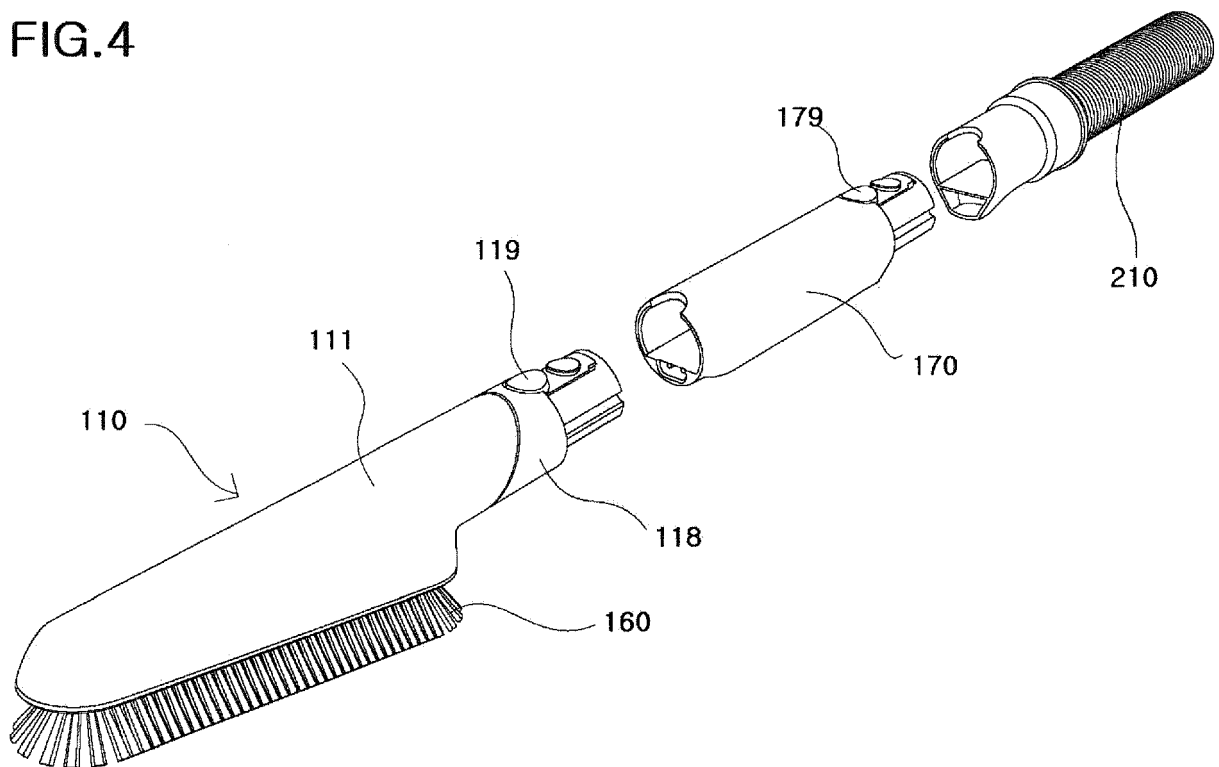
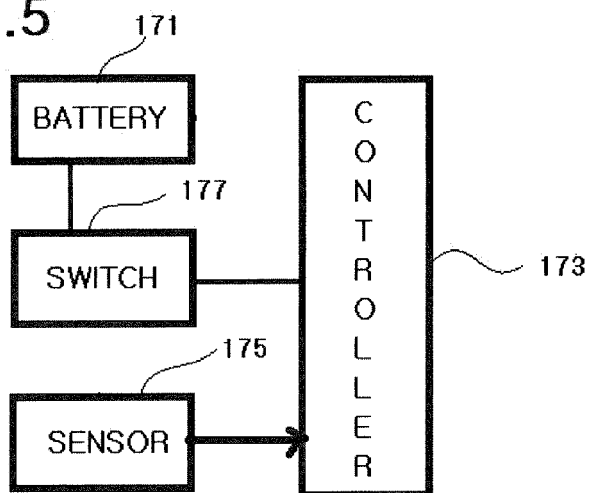
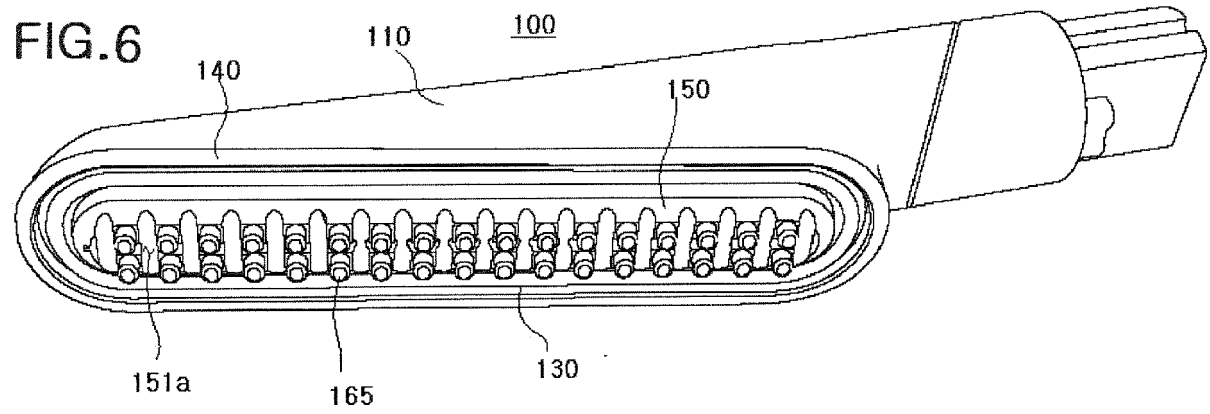


FIG.5







EUROPEAN SEARCH REPORT

Application Number

EP 22 20 9468

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2014/123434 A1 (BOSSES MARK D [US]) 8 May 2014 (2014-05-08)	1-6, 8, 14, 15	INV. A47L9/04
A	* paragraph [0034] - paragraph [0041]; figures 5-7 *	7, 9-13	A47L9/06

X	US 2005/278891 A1 (BOSSES MARK D [US]) 22 December 2005 (2005-12-22)	1-6, 8, 14, 15	
A	* paragraph [0055]; figures 1-5 *	7, 9-13	

			TECHNICAL FIELDS SEARCHED (IPC)
			A47L
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 May 2023	Examiner Trimarchi, Roberto
CATEGORY OF CITED DOCUMENTS 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		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	

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

EP 22 20 9468

5 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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-05-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014123434 A1	08-05-2014	CA 2890181 A1	08-05-2014
		EP 2914154 A1	09-09-2015
		US 2014123434 A1	08-05-2014
		WO 2014071177 A1	08-05-2014

US 2005278891 A1	22-12-2005	NONE	
