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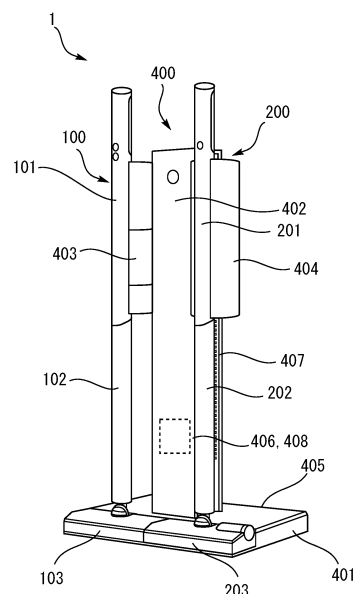
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(54) **CHARGING BASE AND ELECTRIC VACUUM CLEANER SYSTEM**

(57) A charging base (400) includes: a base seat (401) installed on a floor surface; a columnar tower part (402) provided on the base seat (401); a first support (403) provided on the tower part (402) and capable of supporting a vertical first electric vacuum cleaner (100); and a second support (404) provided on the tower part (402) and capable of supporting a vertical second electric vacuum cleaner (200). An electric vacuum cleaner system 1 includes the charging base (400) configured as described above, the vertical first electric vacuum cleaner (100), and the vertical second electric vacuum cleaner (200).

FIG. 1



Description

[Field]

[0001] The present invention relates to a charging base and an electric vacuum cleaner system.

[Background]

[0002] PTL 1 discloses a rechargeable vacuum cleaner. This rechargeable vacuum cleaner is a vertical electric vacuum cleaner supported by a charging base. The rechargeable vacuum cleaner described in PTL 1 includes a suction part that sucks dust as a cleaning tool configured to remove dust on a surface to be cleaned.

[Citation List]

[Patent Literature]

[0003] [PTL 1] JP 2004-121469 A

[Summary]

[Technical Problem]

[0004] The charging base described in PTL 1 is configured to be able to support one rechargeable vacuum cleaner. In the related art disclosed in PTL 1, when a plurality of rechargeable vacuum cleaners are to be installed, a space for installing a plurality of charging bases has been required. Also, in the related art disclosed in PTL 1, when a plurality of suction parts are to be installed, a space for installing a plurality of charging bases has been required.

[0005] The present invention has been made to solve the problems as described above. It is an object of the present invention to make an installation space smaller than a conventional one, the installation space being required when a plurality of vertical electric vacuum cleaners supported by a charging base are to be installed. It is also an object of the present invention to make an installation space smaller than a conventional one, the installation space being required when a plurality of cleaning tools of vertical electric vacuum cleaners supported by a charging base are to be installed.

Solution to Problem

[0006] A charging base according to the present invention includes: a base seat installed on a floor surface; a columnar tower part provided on the base seat; a first support provided on the tower part and capable of supporting a vertical first electric vacuum cleaner; and a second support provided on the tower part and capable of supporting a vertical second electric vacuum cleaner. An electric vacuum cleaner system according to the present invention includes the charging base configured as de-

scribed above, the vertical first electric vacuum cleaner, and the vertical second electric vacuum cleaner.

[0007] Further, a charging base according to the present invention includes: a charging base body having a base seat installed on a floor surface and a columnar tower part provided on the base seat; and a support provided on the tower part and capable of supporting a body of a vertical electric vacuum cleaner having an electric blower built-in. The body of the electric vacuum cleaner includes a body connection to which a first cleaning tool configured to remove dust on a surface to be cleaned and a second cleaning tool configured to remove dust on the surface to be cleaned are removably attached. A first cleaning tool connection connectable to the body connection is formed on the first cleaning tool, and a second cleaning tool connection connectable to the body connection is formed on the second cleaning tool. The support is configured to be able to support the body of the electric vacuum cleaner with the body connection facing downward. The charging base body is configured to be able to support the first cleaning tool with the first cleaning tool connection facing upward and support the second cleaning tool with the second cleaning tool connection facing upward. An electric vacuum cleaner system according to the present invention includes the charging base configured as described above, the body of the vertical electric vacuum cleaner having the electric blower built-in, the first cleaning tool, and the second cleaning tool.

[Advantageous Effects of Invention]

[0008] According to the present invention, it is possible to make an installation space smaller than a conventional one, the installation space being required when a plurality of vertical electric vacuum cleaners supported by a charging base are to be installed.

[0009] According to the present invention, it is possible to make an installation space smaller than a conventional one, the installation space being required when a plurality of cleaning tools of vertical electric vacuum cleaners supported by a charging base are to be installed.

[Brief Description of Drawings]

[0010]

[Fig. 1]

Fig. 1 is a perspective view of an electric vacuum cleaner system of a first embodiment.

[Fig. 2]

Fig. 2 is a perspective view of the electric vacuum cleaner system in the first embodiment in a state where a first electric vacuum cleaner has been removed from a charging base.

[Fig. 3]

Fig. 3 is a perspective view of a second electric vacuum cleaner of the first embodiment.

[Fig. 4]

Fig. 4 is a perspective view of a second head of the first embodiment.

[Fig. 5]

Fig. 5 is a perspective view of a first head of the first embodiment.

[Fig. 6]

Fig. 6 is a plan view of the electric vacuum cleaner system of the first embodiment.

[Fig. 7]

Fig. 7 is a plan view illustrating a first modification of the electric vacuum cleaner system of the first embodiment.

[Fig. 8]

Fig. 8 is a front view illustrating a second modification of the electric vacuum cleaner system of the first embodiment.

[Fig. 9]

Fig. 9 is a front view illustrating the second modification of the electric vacuum cleaner system of the first embodiment.

[Fig. 10]

Fig. 10 is a front view of an electric vacuum cleaner system of a second embodiment.

[Fig. 11]

Fig. 11 is a front view of the electric vacuum cleaner system of the second embodiment.

[Fig. 12]

Fig. 12 is a plan view of the electric vacuum cleaner system of the second embodiment.

[Description of Embodiments]

[0011] Hereinafter, embodiments will be described below with reference to the drawings. The same reference numerals in the drawings indicate the same or corresponding portions. In addition, in the present disclosure, redundant descriptions are simplified or omitted as appropriate. Note that the present invention may include any combination of the configurations disclosed by the following respective embodiments.

First Embodiment

[0012] Fig. 1 is a perspective view of an electric vacuum cleaner system 1 of the first embodiment. As illustrated in Fig. 1, the electric vacuum cleaner system 1 of the present embodiment includes a first electric vacuum cleaner 100, a second electric vacuum cleaner 200, and a charging base 400.

[0013] The first electric vacuum cleaner 100 is a cordless-type vertical electric vacuum cleaner. The second electric vacuum cleaner 200 is a cordless-type vertical electric vacuum cleaner. The vertical electric vacuum cleaner is also called a stick-type electric vacuum cleaner. A secondary battery (not illustrated) is built inside the cordless-type first electric vacuum cleaner 100. Similarly, a secondary battery (not illustrated) is built inside the

cordless-type second electric vacuum cleaner 200.

[0014] The charging base 400 can stand by itself. The charging base 400 is installed on a floor surface in a room or the like, for example, and used. The self-standing charging base 400 is configured to be able to simultaneously support the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200. The first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are supported by the charging base 400 in an upright state, for example.

[0015] The first electric vacuum cleaner 100 in the present embodiment is an example of the vertical first electric vacuum cleaner. The second electric vacuum cleaner 200 in the present embodiment is an example of the vertical second electric vacuum cleaner. The first electric vacuum cleaner 100 is an electric vacuum cleaner separate from the second electric vacuum cleaner 200. A specification of the first electric vacuum cleaner 100 is different from, for example, a specification of the second electric vacuum cleaner 200. Note that the specification of the first electric vacuum cleaner 100 may be the same as the specification of the second electric vacuum cleaner 200.

[0016] The first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are removably attached to the charging base 400. In the state illustrated in Fig. 1, both the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 have been attached to the charging base 400.

[0017] In the present disclosure, as a rule, each of the vertical and horizontal directions is defined with reference to the state illustrated in Fig. 1. In other words, in the present disclosure, as a rule, each of the vertical and horizontal directions is defined with reference to a state in which the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are supported by the charging base 400 installed on a horizontal plane.

[0018] Fig. 2 is a perspective view of the electric vacuum cleaner system 1 in the first embodiment in a state where the first electric vacuum cleaner 100 has been removed from the charging base 400. In the state illustrated in Fig. 2, the first electric vacuum cleaner 100 has been removed from the charging base 400. In the state illustrated in Fig. 2, the second electric vacuum cleaner 200 has been attached to the charging base 400. Fig. 2 illustrates the appearance of the first electric vacuum cleaner 100 removed from the charging base 400, and the appearance of the second electric vacuum cleaner 200 attached to the charging base 400 and the charging base 400 supporting the second electric vacuum cleaner 200.

[0019] The charging base 400 has a function of charging the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200. The charging base 400 can be connected to an external power supply by a power supply cable (not illustrated). The first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are charged by being attached to the charging base 400

connected to the external power supply.

[0020] The configuration of the first electric vacuum cleaner 100 will be described in more detail with reference to Figs. 1 and 2. As illustrated in Fig. 1, the first electric vacuum cleaner 100 includes, as main components, a first vacuum cleaner body part 101, a first extension pipe 102, and a first head 103.

[0021] The first extension pipe 102 is a cylindrical member that extends linearly. One end of the first extension pipe 102 can be connected to the first head 103. The first head 103 is removably attached to the first extension pipe 102. The other end of the first extension pipe 102 can be connected to the first vacuum cleaner body part 101. The first extension pipe 102 is removably attached to the first vacuum cleaner body part 101.

[0022] The first head 103 is configured to remove dust on a surface to be cleaned, such as a floor surface. In the present disclosure, objects to be cleaned by the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200, such as dirt, grit, mote, hair, and fiber, are collectively referred to as "dust." The surface to be cleaned in the present disclosure includes not only the floor surface but also the upper surfaces of objects such as a table and a futon.

[0023] The first head 103 is a part also called a cleaning tool. The first head 103 is removably connected to the first vacuum cleaner body part 101 through the first extension pipe 102.

[0024] The first vacuum cleaner body part 101 and the first extension pipe 102 in the present embodiment are examples of the first body included in the first electric vacuum cleaner according to the present disclosure. The first head 103 is an example of the first cleaning tool removably attached to the first body according to the present disclosure.

[0025] Note that the first head 103 may be removably connected to the first vacuum cleaner body part 101 without the first extension pipe 102. The first vacuum cleaner body part 101 and the first extension pipe 102 may be integrated. That is, the first body included in the first electric vacuum cleaner according to the present disclosure need not have a removable cylindrical member like the first extension pipe 102 in the present embodiment.

[0026] An air passage for allowing air containing dust to flow from the outside into the first vacuum cleaner body part 101 is formed inside the first extension pipe 102 and the first head 103. In the present disclosure, the air containing dust may be referred to as "dust-containing air." Also, in the present disclosure, air in a clean state after dust is removed may be referred to as "clean air."

[0027] The first vacuum cleaner body part 101 has a function of separating dust from dust-containing air. The first vacuum cleaner body part 101 has a function of collecting the separated dust. The first vacuum cleaner body part 101 includes, as an example, a first grip 104, a first suction pipe 105, a first body part 106, and a first dust collection part 107.

[0028] The first grip 104 is a member to be gripped by

a user with the hand during the use of the first electric vacuum cleaner 100. The first suction pipe 105 is a cylindrical member extending linearly. A flow passage through which dust-containing air, having passed through the first head 103 and the first extension pipe 102, flows is formed inside the first suction pipe 105.

[0029] A first electric blower 108 is built in the first body part 106. The first electric blower 108 is an apparatus that generates an airflow for the first electric vacuum cleaner 100 to suck dust. The first grip 104 is mechanically connected to the first body part 106 having the first electric blower 108 built-in. The first suction pipe 105 is formed so as to be continuous with the first grip 104. As an example, the lower end of the first suction pipe 105 is located below the lower end of the first body part 106.

[0030] The first dust collection part 107 is a dust collector that separates dust from dust-containing air and collects the dust. The first dust collection part 107 can be attached to and removed from the first body part 106. An air passage communicating with an air passage inside the first suction pipe 105 is formed inside the first body part 106 and the first dust collection part 107. The first electric blower 108 is installed on the air passage inside the first body part 106.

[0031] As an example, the first dust collection part 107 swirls dust-containing air, sucked by an airflow generated by the first electric blower 108, and separates dust by centrifugal force. As an example, the first dust collection part 107 has a cyclone separation function. Note that the first dust collection part 107 is not limited to a cyclone-type dust collector. The first dust collection part 107 may be, for example, a paper pack-type dust collector.

[0032] As illustrated in Fig. 2, the first grip 104 is provided with a first operation display 109. The first operation display 109 is for the user to operate the first electric vacuum cleaner 100. The first operation display 109 includes, for example, a plurality of buttons for controlling the operation of the first electric vacuum cleaner 100. The first electric blower 108 performs a preset action in accordance with an operation performed by the user on the first operation display 109. In addition, the first operation display 109 also displays the state of the first electric vacuum cleaner 100 to the user. The first operation display 109 includes, for example, a lamp and a liquid crystal screen.

[0033] The secondary battery (not illustrated) is built in the first body part 106. The secondary battery is an electric power source for driving the first electric blower 108. The secondary battery built in the first body part 106 is charged by the first electric vacuum cleaner 100 being attached to the charging base 400.

[0034] Next, the configuration of the second electric vacuum cleaner 200 will be described in more detail. The overall configuration of the second electric vacuum cleaner 200 is basically the same as the overall configuration of the first electric vacuum cleaner 100. As illustrated in Figs. 1 and 2, the second electric vacuum cleaner 200 includes, as main components, a second vacuum

cleaner body part 201, a second extension pipe 202, and a second head 203.

[0035] The second extension pipe 202 is a cylindrical member that extends linearly. One end of the second extension pipe 202 can be connected to the second head 203. The second head 203 is removably attached to the second extension pipe 202. The other end of the second extension pipe 202 can be connected to the second vacuum cleaner body part 201. The second extension pipe 202 is removably attached to the second vacuum cleaner body part 201.

[0036] The second head 203 is configured to remove dust on the surface to be cleaned, such as the floor surface. The second head 203 is a part also called a cleaning tool. The second head 203 is removably connected to the second vacuum cleaner body part 201 through a second extension pipe 202. An air passage for allowing air containing dust to flow from the outside into the second vacuum cleaner body part 201 is formed inside the second extension pipe 202 and the second head 203.

[0037] The second vacuum cleaner body part 201 and the second extension pipe 202 are examples of the second body included in the second electric vacuum cleaner according to the present disclosure. The second head 203 is an example of the second cleaning tool removably attached to the second body according to the present disclosure.

[0038] Note that the second head 203 may be removably connected to the second vacuum cleaner body part 201 without the second extension pipe 202. The second vacuum cleaner body part 201 and the second extension pipe 202 may be integrated. That is, the second body included in the second electric vacuum cleaner according to the present disclosure need not have a removable cylindrical member like the second extension pipe 202 in the present embodiment.

[0039] The second vacuum cleaner body part 201 has a function of separating dust from dust-containing air and collecting the dust, similarly to the first vacuum cleaner body part 101. Note that the specification of the second vacuum cleaner body part 201 may be the same as or different from the specification of the first vacuum cleaner body part 101.

[0040] Fig. 3 is a perspective view of the second electric vacuum cleaner 200 of the first embodiment. Fig. 3 illustrates the appearance of the second electric vacuum cleaner 200 removed from the charging base 400. The second vacuum cleaner body part 201 includes, as an example, a second grip 204, a second suction pipe 205, a second body part 206, and a second dust collection part 207 illustrated in Fig. 3.

[0041] The second grip 204 is a member to be gripped by the user with the hand during the use of the second electric vacuum cleaner 200. The second suction pipe 205 is a cylindrical member extending linearly. A flow passage through which dust-containing air, having passed through the second head 203 and the second extension pipe 202, flows is formed inside the second

suction pipe 205.

[0042] A second electric blower 208 is built in the second body part 206. The second electric blower 208 is an apparatus that generates an airflow for the second electric vacuum cleaner 200 to suck dust. The second grip 204 is mechanically connected to the second body part 206 having the second electric blower 208 built-in. The second suction pipe 205 is formed so as to be continuous with the second grip 204. As an example, the lower end of the second suction pipe 205 is located below the lower end of the second body part 206.

[0043] The second dust collection part 207 is a dust collector that separates dust from dust-containing air and collecting the dust. The second dust collection part 207 can be attached to and removed from the second body part 206. An air passage communicating with an air passage inside the second suction pipe 205 is formed inside the second body part 206 and the second dust collection part 207. The second electric blower 208 is installed on the air passage inside the second body part 206.

[0044] As an example, the second dust collection part 207 swirls dust-containing air, sucked by the airflow generated by the second electric blower 208, and separates dust by centrifugal force. As an example, the second dust collection part 207 has a cyclone separation function. Note that the second dust collection part 207 is not limited to a cyclone-type dust collector but may be, for example, a paper-pack dust collector.

[0045] As illustrated in Fig. 3, the second grip 204 is provided with a second operation display 209. The second operation display 209 is for the user to operate the second electric vacuum cleaner 200. The second operation display 209 includes, for example, a plurality of buttons for controlling the operation of the second electric vacuum cleaner 200. The second electric blower 208 performs a preset action in accordance with an operation performed by the user on the second operation display 209. The second operation display 209 also displays the state of the second electric vacuum cleaner 200 to the user. The second operation display 209 includes, for example, a lamp and a liquid crystal screen.

[0046] The secondary battery (not illustrated) is built in the second body part 206. The secondary battery is an electric power source for driving the second electric blower 208. The secondary battery built in the second body part 206 is charged by the second electric vacuum cleaner 200 being attached to the charging base 400.

[0047] Fig. 4 is a perspective view of the second head 203 of the first embodiment. Fig. 5 is a perspective view of the first head 103 of the first embodiment. The specifications of the first head 103 and the second head 203 in the present embodiment will be described with reference to Figs. 4 and 5.

[0048] As illustrated in Figs. 4 and 5, in the present embodiment, the appearance of the first head 103 is different from the appearance of the second head 203. The part configuration of the first head 103 is different from the part configuration of the second head 203. The spec-

ification of the first head 103 is different from the specification of the second head 203.

[0049] In the present embodiment, as illustrated in Fig. 4, the second head 203 includes a rotary brush 210. The rotary brush 210 is a part that rotates to scrape up and remove dust on the surface to be cleaned.

[0050] The rotary brush 210 is provided so as to face a second head suction port 211 formed on the bottom surface of the second head 203. The bottom surface of the second head 203 is a surface facing the surface to be cleaned when the second head 203 is used. The second head suction port 211 is an opening for taking dust-containing air into the second head 203. A brush chamber, which is a space communicating with the second head suction port 211, is formed inside the second head 203. The rotary brush 210 is installed in the brush chamber.

[0051] As illustrated in Fig. 4, the second head 203 includes a brush motor 212. The brush motor 212 is an electric motor for rotating the rotary brush 210. The rotary brush 210 is set in the brush chamber in a state capable of being rotated by the brush motor 212. The rotary brush 210 rotates when the brush motor 212 is driven. The brush motor 212 is driven, for example, by electric power supplied from the secondary battery built in the second body part 206.

[0052] As illustrated in Fig. 5, the first head 103 includes a wiping body 110. The wiping body 110 is a part that adsorbs and removes dust on the surface to be cleaned. The wiping body 110 is a part for wiping the surface to be cleaned. At the time of removal of dust by the wiping body 110, the first electric blower 108 is not essentially driven. The wiping body 110 is a part different in specification from the rotary brush 210.

[0053] The wiping body 110 is provided so as to face a first head suction port 111 formed on the bottom surface of the first head 103. The bottom surface of the first head 103 is a surface facing the surface to be cleaned when the first head 103 is used. The first head suction port 111 is an opening for taking dust-containing air into the first head 103.

[0054] When the user is to clean a smooth surface to be cleaned, such as floor covering, the user uses the first head 103 including the wiping body 110 and the first electric vacuum cleaner 100 including the first head. By using the first head 103 provided with the wiping body 110 and the first electric vacuum cleaner 100 provided with the first head, the user can easily clean noticeable hair and dust.

[0055] The wiping body 110 is not a part driven by an electric motor like the rotary brush 210. When dust is to be removed by the wiping body 110, there is no need for the first electric blower 108 to be driven. By using the first head 103 and the first electric vacuum cleaner 100 provided with the first head 103, the user can do the cleaning without worrying about noise to the surroundings, for example, even at night.

[0056] The user uses the second head 203 including

a rotary brush 210 and the second electric vacuum cleaner 200 including the second head 203 when cleaning a surface to be cleaned into which dust easily enters, such as a carpet or a tatami mat. By using the second head 203 provided with the rotary brush 210 and the second electric vacuum cleaner 200 including the second head, the user can effectively remove dust having entered the depth of the surface to be cleaned.

[0057] As described above, in the present embodiment, the specifications of the first head 103 and the second head 203 are different from each other, so that the user can use the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 separately in accordance with the time period for cleaning, the type of the surface to be cleaned, and the type of dust.

[0058] Note that the specification of the first head 103 included in the first electric vacuum cleaner 100 and the specification of the second head 203 included in the second electric vacuum cleaner 200 are not limited to those described above. For example, the first head 103 may include a rotary brush 210. Also, the second head 203 may include the wiping body 110.

[0059] The specification of the first head 103 and the specification of the second head 203 are not necessarily different. The first head 103 and the second head 203 may be interchangeable. The first head 103 may be attachable to and removable from the second vacuum cleaner body part 201 and the second extension pipe 202. The second head 203 may be attachable to and removable from the first vacuum cleaner body part 101 and the first extension pipe 102.

[0060] Next, a description will be given of the action of the first electric vacuum cleaner 100 configured as described above during use, and the action of the second electric vacuum cleaner 200 configured as described above during use. The first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are removed from the charging base 400 during use. The user of the first electric vacuum cleaner 100 moves the first electric vacuum cleaner 100 back and forth, with the first head 103 in close contact with the surface to be cleaned, for example. Thereby, the dust on the surface to be cleaned is removed by the wiping body 110.

[0061] The user of the first electric vacuum cleaner 100 may operate the first operation display 109 to drive the first electric blower 108. By the drive of the first electric blower 108, an airflow configured to suck dust is generated. Thus, dust-containing air is sucked from the first head suction port 111 of the first head 103. The dust-containing air sucked from the first head suction port 111 is sent to the first dust collection part 107. The dust-containing air sent to the first dust collection part 107 is separated into dust and air. The dust is collected by the first dust collection part 107. The air separated from the dust by the first dust collection part 107, that is, clean air, is discharged to the outside of the first electric vacuum cleaner 100.

[0062] The user attaches the first electric vacuum

cleaner 100 to the charging base 400 after using the first electric vacuum cleaner 100. The first electric vacuum cleaner 100 is attached to the charging base 400 and charged when not in use.

[0063] The user of the second electric vacuum cleaner 200 operates the second operation display 209, with the second head 203 in close contact with the surface to be cleaned, for example. The second electric blower 208 and the brush motor 212 are driven in accordance with the operation on the second operation display 209. When the brush motor 212 is driven, the rotary brush 210 rotates to scrape up the dust adhering to the surface to be cleaned.

[0064] By the drive of the second electric blower 208, an airflow for sucking the dust is generated. Thus, the dust-containing air containing the dust scraped up by the rotary brush 210 is sucked from the second head suction port 211 of the second head 203. The dust-containing air sucked from the second head suction port 211 is sent to the second dust collection part 207. The dust-containing air sent to the second dust collection part 207 is separated into dust and air. The dust is collected by the second dust collection part 207. The air separated from the dust by the second dust collection part 207, that is, clean air, is discharged to the outside of the second electric vacuum cleaner 200.

[0065] The user attaches the second electric vacuum cleaner 200 to the charging base 400 after using the second electric vacuum cleaner 200. The second electric vacuum cleaner 200 is attached to the charging base 400 and charged when not in use.

[0066] Fig. 6 is a plan view of the electric vacuum cleaner system of the first embodiment. Referring to Figs. 1, 2, and 6, the configuration of the charging base 400 of the present embodiment will be described in more detail.

[0067] As described above, the charging base 400 of the present embodiment is configured to be able to simultaneously support the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200. As illustrated in the drawings, the charging base 400 includes a base seat 401 and a tower part 402. The base seat 401 and the tower part 402 are examples of the charging base body according to the present disclosure.

[0068] The base seat 401 is a member that is installed on the floor surface. The bottom surface of the base seat 401 faces the floor surface. The base seat 401 forms a base of the charging base 400. The base seat 401 is the lowermost portion of the charging base 400. As an example, the base seat 401 is formed so as to have a rectangular outer shape in a plan view.

[0069] The tower part 402 is a columnar member. The tower part 402 is provided on the base seat 401. The tower part 402 is a columnar member. The lower end of the tower part 402 is fixed to the base seat 401. As an example, the tower part 402 is configured to stand upward from the center in a plan view of the bottom surface of the base seat 401. As an example, the tower part 402 is configured to stand vertically upward from the upper

surface of the base seat 401. As an example, the dimension in the height direction of the tower part 402 is set longer than the dimension in the right-left direction of the base seat 401 and the dimension in the front-rear direction of the base seat 401.

[0070] The tower part 402 is provided with a first support 403 configured to be able to support the first electric vacuum cleaner 100. The tower part 402 is provided with a second support 404 configured to be able to support the second electric vacuum cleaner 200. The first support 403 and the second support 404 are provided in the same tower part 402.

[0071] As an example, the first support 403 is formed in a shape in which the first body part 106 can be fitted. The first support 403 is provided with a recess adapted to the outer shape of the first body part 106. The first support 403 takes hold of the first body part 106 to support the first electric vacuum cleaner 100. As an example, the second support 404 is formed in a shape in which the second body part 206 can be fitted. The second support 404 is provided with a recess adapted to the outer shape of the second body part 206. The second support 404 takes hold of the second body part 206 to support the second electric vacuum cleaner 200.

[0072] The first support 403 is provided with a terminal connectable to a terminal provided in the first body part 106. When the first body part 106 is attached to the first support 403, the terminal provided on the first support 403 is electrically connected to the terminal provided on the first body part 106. As a result, the first electric vacuum cleaner 100 is electrically connected to the charging base 400 and charged.

[0073] The second support 404 is provided with a terminal connectable to a terminal provided in the second body part 206. When the second body part 206 is attached to the second support 404, the terminal provided on the second support 404 is electrically connected to the terminal provided on the second body part 206. As a result, the second electric vacuum cleaner 200 is electrically connected to the charging base 400 and charged.

[0074] Note that the mechanism for electrically connecting the first electric vacuum cleaner 100 and the charging base 400 is not limited to the terminals described above. The mechanism for electrically connecting the first electric vacuum cleaner 100 and the charging base 400 may be provided, for example, on the base seat 401, the tower part 402, and the like. Similarly, the mechanism for electrically connecting the second electric vacuum cleaner 200 and the charging base 400 may be provided, for example, on the base seat 401 and the tower part 402.

[0075] As described above, the charging base 400 of the present embodiment includes the first support 403 and the second support 404 which are provided in the same tower part 402. Hence in the present embodiment, the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are supported by one charging base 400. Therefore, according to the present embodi-

ment, the installation space required for installing a plurality of vertical electric vacuum cleaners can be made smaller than a conventional one.

[0076] According to the electric vacuum cleaner system 1 of the present embodiment, a first user using the first electric vacuum cleaner 100 and a second user using the second electric vacuum cleaner 200 can simultaneously do the cleaning. According to the present embodiment, a plurality of users can simultaneously do the cleaning, so that the time required to complete the cleaning can be reduced.

[0077] In the present embodiment, when the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are supported by the charging base 400, the first head 103 and the second head 203 are placed on the base seat 401. Thus, the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are supported in a more stable state.

[0078] Note that the first head 103 and the second head 203 may be in a state of floating from the base seat 401 when the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are supported by the charging base 400. For example, the tower part 402 may be formed so as to come into contact with the first head 103 and the second head 203 and support the first head 103 and the second head 203.

[0079] As illustrated in Figs. 1, 2, and 6, in the present embodiment, the first support 403 and the second support 404 are provided so as to surround the tower part 402. The first support 403 and the second support 404 are configured to extend in directions different from each other from the side surfaces of the tower part 402. The first electric vacuum cleaner 100 attached to the first support 403 and the second electric vacuum cleaner 200 attached to the second support 404 are disposed so as to surround the charging base 400. With the configuration as described above, the electric vacuum cleaner system 1 can stand by itself in a stable state. Further, the user can attach and remove the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 in a stable state in which the charging base 400 is unlikely to fall.

[0080] In the present embodiment, the first support 403 and the second support 404 are disposed so as to be aligned right and left. As illustrated in Figs. 1, 2, and 6, in the present embodiment, the first electric vacuum cleaner 100 supported by the first support 403 is positioned next to the second electric vacuum cleaner 200 supported by the second support 404. Since the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are positioned next to each other, the user can easily and selectively remove the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200.

[0081] Further, as illustrated in Fig. 6, when the first electric vacuum cleaner 100 is supported by the first support 403 and the second electric vacuum cleaner 200 is supported by the second support 404, the first head 103

is positioned next to the second head 203. When the first electric vacuum cleaner 100 is supported by the first support 403 and the second electric vacuum cleaner 200 is supported by the second support 404, the longitudinal direction of the first head 103 in a plan view and the longitudinal direction of the second head 203 in the plan view are aligned in the same direction. With the configuration as described above, the user may apply a force in the same direction both when removing the first electric vacuum cleaner 100 and when removing the second electric vacuum cleaner 200. The user may twist the wrist or the like in the same direction both when removing the first electric vacuum cleaner 100 and when removing the second electric vacuum cleaner 200. According to the present embodiment, it is possible to obtain the charging base 400 and the electric vacuum cleaner system 1 which are more convenient to use.

[0082] As an example, the charging base 400 may have an air cleaning function for cleaning the indoor air. The charging base 400 having the air cleaning function includes: an intake port 405 configured to suck air; a filter 406 that collects dust in the air sucked from the intake port 405; an exhaust port 407 configured to discharge the air that passes through the filter 406; and a fan 408 that generates an airflow from the intake port 405 toward the exhaust port 407.

[0083] The intake port 405 is formed, for example, in the base seat 401. Thus, dust in the vicinity of the floor surface is sucked efficiently. The filter 406 and the fan 408 are built in the tower part 402, for example. The exhaust port 407 is formed, for example, on the side surface of the tower part 402.

[0084] The charging base 400 configured as described above can achieve both the function as a device for charging the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 and the function as an air cleaner. Further, the charging base 400 configured as described above can remove dust that is blown up in the indoor air when the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are used. Hence it is possible to prevent the dust once blown up from falling again onto the floor surface and adhering thereto. With the charging base 400 configured as described above, it is possible to suppress the amount of dust accumulated on the floor surface and to reduce the frequency with which the user cleans the floor surface. Note that the charging base 400 according to the present disclosure does not necessarily have the air cleaning function.

[0085] Next, modifications of the first embodiment will be described. Fig. 7 is a plan view illustrating a first modification of the electric vacuum cleaner system of the first embodiment. As illustrated in Fig. 7, a recess 402a may be formed in the tower part 402. In the modification illustrated in Fig. 7, a first recess 402a and a second recess 402a are formed in the tower part 402. The recess 402a is a concave portion recessed toward the center of the tower part 402 in a plan view. The recess 402a is formed

on the side surface of the tower part 402.

[0086] The first recess 402a is provided with a first support 403. The second recess 402a is provided with a second support 404. According to the first modification, the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 are each accommodated in a recessed space formed on the side surface of the tower part 402. With the configuration as described above, the dimension in the width direction, that is, the horizontal direction, of the entire electric vacuum cleaner system 1 can be made smaller. According to the first modification, it is possible to obtain the electric vacuum cleaner system 1 that can be installed even in a narrow space such as a space between pieces of furniture.

[0087] Figs. 8 and 9 are front views illustrating a second modification of the electric vacuum cleaner system 1 of the first embodiment. Fig. 8 illustrates a state in which the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 have been attached to the charging base 400. Fig. 9 illustrates a state in which the first electric vacuum cleaner 100 and the second electric vacuum cleaner 200 have been removed from the charging base 400.

[0088] In the second modification, the first body part 106 is attached to and removed from the first support 403 provided in the first recess 402a. The second body part 206 is attached to and removed from the second support 404 provided in the second recess 402a.

[0089] In the second modification, the first body part 106 supported by the first support 403 is located above the second body part 206 supported by the second support 404. In the second modification, the second body part 206 is disposed in the vicinity of the floor surface. The first body part 106 is disposed at a position separated from the floor surface. The distance from the floor surface to the bottom surface of the second body part 206 is shorter than the distance from the floor surface to the bottom surface of the first body part 106. The first body part 106 supported by the first support 403 and the second body part 206 supported by the second support 404 are disposed so as to be across the center of the tower part 402 from above and below in a front view. With the configuration of the second modification, the overall dimensions of the electric vacuum cleaner system 1 can be made smaller.

Second Embodiment

[0090] Next, a second embodiment will be described. The same or corresponding portions as those in the first embodiment are denoted by the same reference numerals, and the description thereof will be simplified or omitted. Figs. 10 and 11 are front views of an electric vacuum cleaner system 2 of the second embodiment. Fig. 12 is a plan view of the electric vacuum cleaner system 2 of the second embodiment.

[0091] As illustrated in Figs. 10 to 12, the electric vacuum cleaner system 2 of the present embodiment in-

cludes a first electric vacuum cleaner 100 and a charging base 400. The electric vacuum cleaner system 2 includes a second head 203.

[0092] The first electric vacuum cleaner 100 includes, as main components, a first vacuum cleaner body part 101, a first extension pipe 102, and a first head 103. The charging base 400 includes a base seat 401 and a tower part 402 which are examples of the charging base body. The tower part 402 is provided with a first support 403. The first support 403 is provided in a recess 402a formed in the tower part 402.

[0093] In the present embodiment, both the first head 103 and the second head 203 are configured to be removably attached to the first extension pipe 102. A connection 102a to which the first head 103 and the second head 203 are removably attached is formed on the first extension pipe 102. The connection 102a is an example of the body connection according to the present disclosure.

[0094] In the present embodiment, the first head 103 is provided with a first head connection 103a connectable to the connection 102a. The second head 203 is provided with a second head connection 203a connectable to the connection 102a. The first head connection 103a is an example of the first cleaning tool connection according to the present disclosure. The second head connection 203a is an example of the second cleaning tool connection according to the present disclosure.

[0095] The first support 403 is configured to be able to support the first vacuum cleaner body part 101 with the connection 102a facing downward. As illustrated in Fig. 10, when the first vacuum cleaner body part 101 is attached to the charging base 400, the connection 102a faces downward.

[0096] In the present embodiment, the charging base 400 is configured to be able to simultaneously support the first head 103, the second head 203, and the first electric vacuum cleaner 100 in a state where the cleaning tool, such as the first head 103, has been removed. The base seat 401 and the tower part 402, which are examples of the charging base body, are configured to be able to simultaneously support the first head 103 and the second head 203.

[0097] The first head 103 and the second head 203 are placed on the base seat 401, for example. The first head 103 and the second head 203 are supported from below by the base seat 401. Note that the first head 103 and the second head 203 may be supported by the tower part 402 in a state floating from the base seat 401, for example.

[0098] Further, the base seat 401 and the tower part 402, which are examples of the charging base body, can support the first head 103 with the first head connection 103a facing upward, as illustrated in Fig. 10. Also, the base seat 401 and the tower part 402, which are examples of the charging base body, can support the second head 203 with the second head connection 203a facing upward, as illustrated in Fig. 10.

[0099] As illustrated in Fig. 10, the charging base 400 of the present embodiment can simultaneously support the first vacuum cleaner body part 101, the first head 103, and the second head 203. Therefore, according to the present embodiment, the installation space required for installing a vertical electric vacuum cleaners and a plurality of cleaning tools can be made smaller than a conventional one.

[0100] As illustrated in Fig. 10, when the first vacuum cleaner body part 101 is attached to the charging base 400, the connection 102a faces downward. When the first head connection 103a is attached to the charging base 400, the first head connection 103a faces upward. When the second head connection 203a is attached to the charging base 400, the second head connection 203a faces upward. In the state illustrated in Fig. 10, the connection 102a and the first head connection 103a face each other. In the state illustrated in Fig. 10, the connection 102a and the second head connection 203a face each other. As an example, in the state illustrated in Fig. 10, the connection 102a is located above the first head connection 103a and the second head connection 203a.

[0101] With the configuration as described above, after removing the first vacuum cleaner body part 101 from the charging base 400, the user can easily connect the first head connection 103a or the second head connection 203a to the connection 102a. Fig. 11 illustrates a state in which the first head connection 103a is connected to the connection 102a, that is, a state in which the first head 103 is connected to the first extension pipe 102, after the first vacuum cleaner body part 101 is removed from the charging base 400.

[0102] As illustrated in Figs. 10 and 12, when the first head 103 and the second head 203 are supported by the charging base 400, the tower part 402 is located between the first head 103 and the second head 203. The first head 103 and the second head 203 are disposed so as to be across the tower part 402 in a plan view. As illustrated in Fig. 12, when the first head 103 and the second head 203 are supported by the charging base 400, the longitudinal direction of the first head 103 in a plan view and the longitudinal direction of the second head 203 in the plan view are aligned in the same direction. With the configuration as described above, the dimension in the width direction, that is, the horizontal direction, of the entire electric vacuum cleaner system 1 can be made smaller.

[0103] Note that the charging base 400 of the first embodiment may be configured to be able to simultaneously support three or more electric vacuum cleaners. The charging base 400 of the second embodiment may be configured to be able to simultaneously support three or more cleaning tools. The configuration of the electric vacuum cleaner system 1 of the first embodiment and the configuration of the electric vacuum cleaner system 2 of the second embodiment can be combined without departing from the spirit of the present disclosure. For example, in the first embodiment, the first electric vacuum

cleaner 100 and the second electric vacuum cleaner 200 may be supported while disposed so as to be across the tower part 402, like the first head 103 and the second head 203 of the second embodiment. Further, in the second embodiment, the first head 103 and the second head 203 may be supported while positioned next to each other.

[Industrial Applicability]

[0104] The charging base according to the present disclosure can be used, for example, for charging an electric vacuum cleaner that cleans a room. Further, the electric vacuum cleaner system according to the present disclosure can be used, for example, for cleaning a room or the like.

[Reference Signs List]

[0105]

1	electric vacuum cleaner system
2	electric vacuum cleaner system
100	first electric vacuum cleaner
101	first vacuum cleaner body part
102	first extension pipe
102a	connection
103	first head
103a	first head connection
104	first grip
105	first suction pipe
106	first body part
107	first dust collection part
108	first electric blower
109	first operation display
110	wiping body
111	first head suction port
200	second electric vacuum cleaner
201	second vacuum cleaner body part
202	second extension pipe
203	second head
203a	second head connection
204	second grip
205	second suction pipe
206	second body part
207	second dust collection part
208	second electric blower
209	second operation display
210	rotary brush
211	second head suction port
212	brush motor
400	charging base
401	base seat
402	tower part
402a	recess
403	first support
404	second support
405	intake port

406 filter
 407 exhaust port
 408 fan

Claims

1. A charging base comprising:

a base seat installed on a floor surface;
 a columnar tower part provided on the base seat;
 a first support provided on the tower part and capable of supporting a vertical first electric vacuum cleaner; and
 a second support provided on the tower part and capable of supporting a vertical second electric vacuum cleaner.

2. The charging base according to claim 1, wherein

the first electric vacuum cleaner includes

a first body having a first electric blower built-in, and
 a first cleaning tool that is removably attached to the first body and removes dust on a surface to be cleaned,

the second electric vacuum cleaner includes

a second body having a second electric blower built-in, and
 a second cleaning tool that is removably attached to the second body and removes dust on the surface to be cleaned, and

a specification of the first cleaning tool is different from a specification of the second cleaning tool.

3. The charging base according to claim 1 or 2, wherein the first electric vacuum cleaner supported by the first support is positioned next to the second electric vacuum cleaner supported by the second support.

4. The charging base according to claim 2, wherein, when the first electric vacuum cleaner is supported by the first support and the second electric vacuum cleaner is supported by the second support, the first cleaning tool is positioned next to the second cleaning tool, and a longitudinal direction of the first cleaning tool in a plan view and a longitudinal direction of the second cleaning tool in the plan view are aligned in the same direction.

5. The charging base according to any one of claims 1 to 4, wherein

a first recess and a second recess recessed toward a center of the tower part in a plan view are formed in the tower part,
 the first support is provided in the first recess, and
 the second support is provided in the second recess.

6. A charging base comprising:

a charging base body having a base seat installed on a floor surface and a columnar tower part provided on the base seat; and
 a support provided on the tower part and capable of supporting a body of a vertical electric vacuum cleaner having an electric blower built-in, the body of the vertical electric vacuum cleaner including a body connection, a first cleaning tool configured to remove dust on a surface to be cleaned and a second cleaning tool configured to remove dust on the surface to be cleaned being removably attached to the body connection, a first cleaning tool connection being formed on the first cleaning tool, the first cleaning tool connection being connectable to the body connection,
 a second cleaning tool connection being formed on the second cleaning tool, the second cleaning tool connection being connectable to the body connection,
 the support being configured to be able to support the body of the vertical electric vacuum cleaner with the body connection facing downward,
 the charging base body being configured to be able to support the first cleaning tool with the first cleaning tool connection facing upward and support the second cleaning tool with the second cleaning tool connection facing upward.

7. The charging base according to claim 6, wherein a specification of the first cleaning tool is different from a specification of the second cleaning tool.

8. The charging base according to claim 6 or 7, wherein, when the first cleaning tool and the second cleaning tool are supported by the charging base body, the tower part is located between the first cleaning tool and the second cleaning tool, and a longitudinal direction of the first cleaning tool in a plan view and a longitudinal direction of the second cleaning tool in the plan view are aligned in the same direction.

9. The charging base according to any one of claims 6 to 8, wherein

a recess recessed toward a center of the tower part in a plan view is formed in the tower part, and

the support is provided in the recess.

10. The charging base according to any one of claims 1 to 9, further comprising:

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an intake port configured to suck air;
 a filter configured to collect dust in the air sucked from the intake port;
 an exhaust port configured to discharge the air that passes through the filter; and
 a fan configured to generate an airflow from the intake port toward the exhaust port.

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11. An electric vacuum cleaner system comprising:

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the charging base according to claim 1;
 the first electric vacuum cleaner; and
 the second electric vacuum cleaner.

12. An electric vacuum cleaner system comprising:

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the charging base according to claim 6;
 the body of the electric vacuum cleaner;
 the first cleaning tool; and
 the second cleaning tool.

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13. An electric vacuum cleaner system comprising:

the charging base according to claim 2 or claim 7;
 the first cleaning tool; and
 the second cleaning tool,
 the first cleaning tool or the second cleaning tool including a rotary brush configured to scrape up and remove dust on a surface to be cleaned.

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14. An electric vacuum cleaner system comprising

the charging base according to claim 2 or claim 7;
 the first cleaning tool; and
 the second cleaning tool,
 the first cleaning tool or the second cleaning tool including a wiping body configured to adsorb and remove dust on a surface to be cleaned.

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15. The electric vacuum cleaner system according to any one of claims 11 to 14, wherein the charging base includes

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an intake port configured to suck air;
 a filter configured to collect dust in the air sucked from the intake port; an exhaust port configured to discharge the air that passes through the filter;
 and
 a fan configured to generate an airflow from the intake port toward the exhaust port.

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FIG. 1

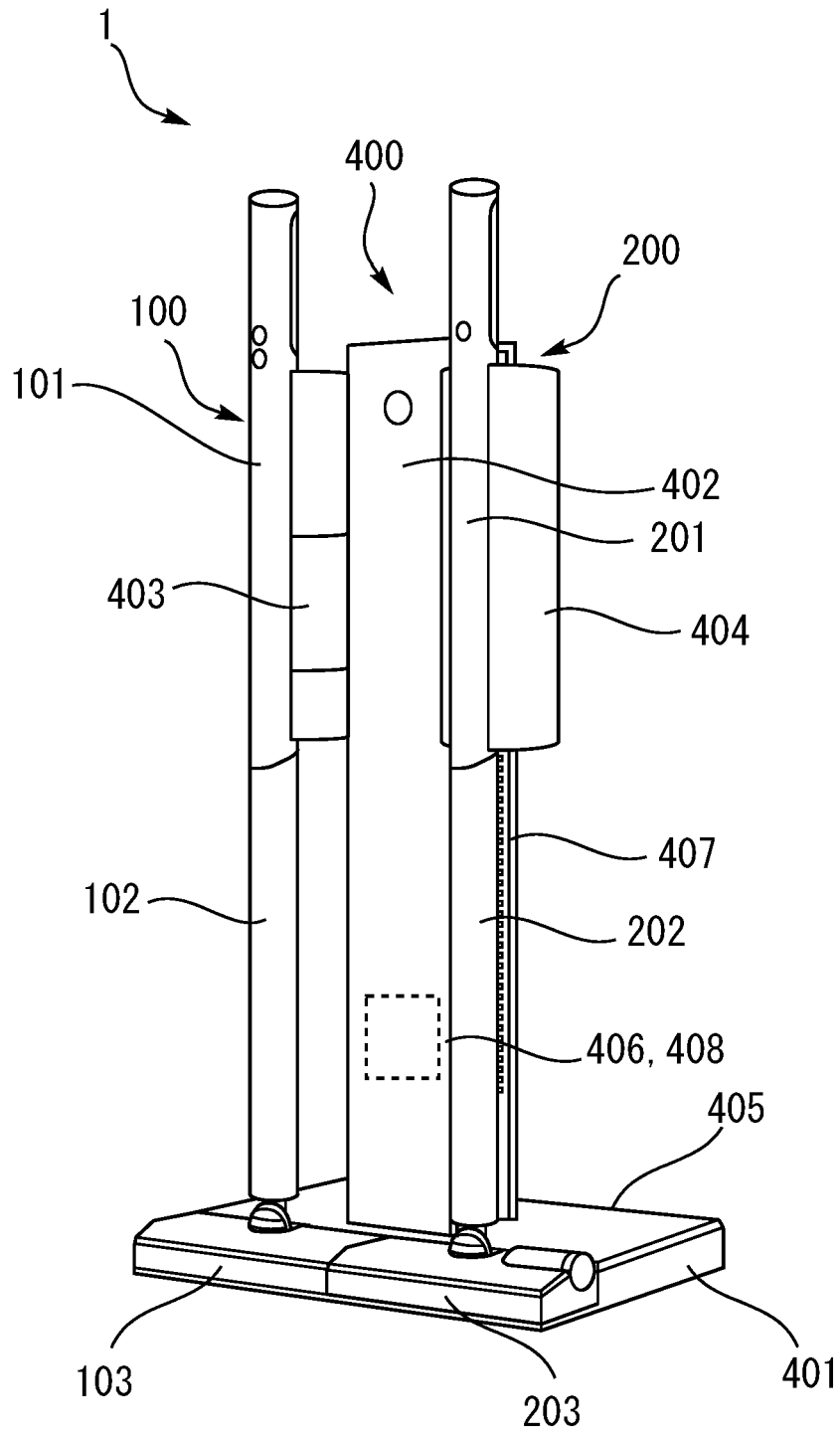


FIG. 2

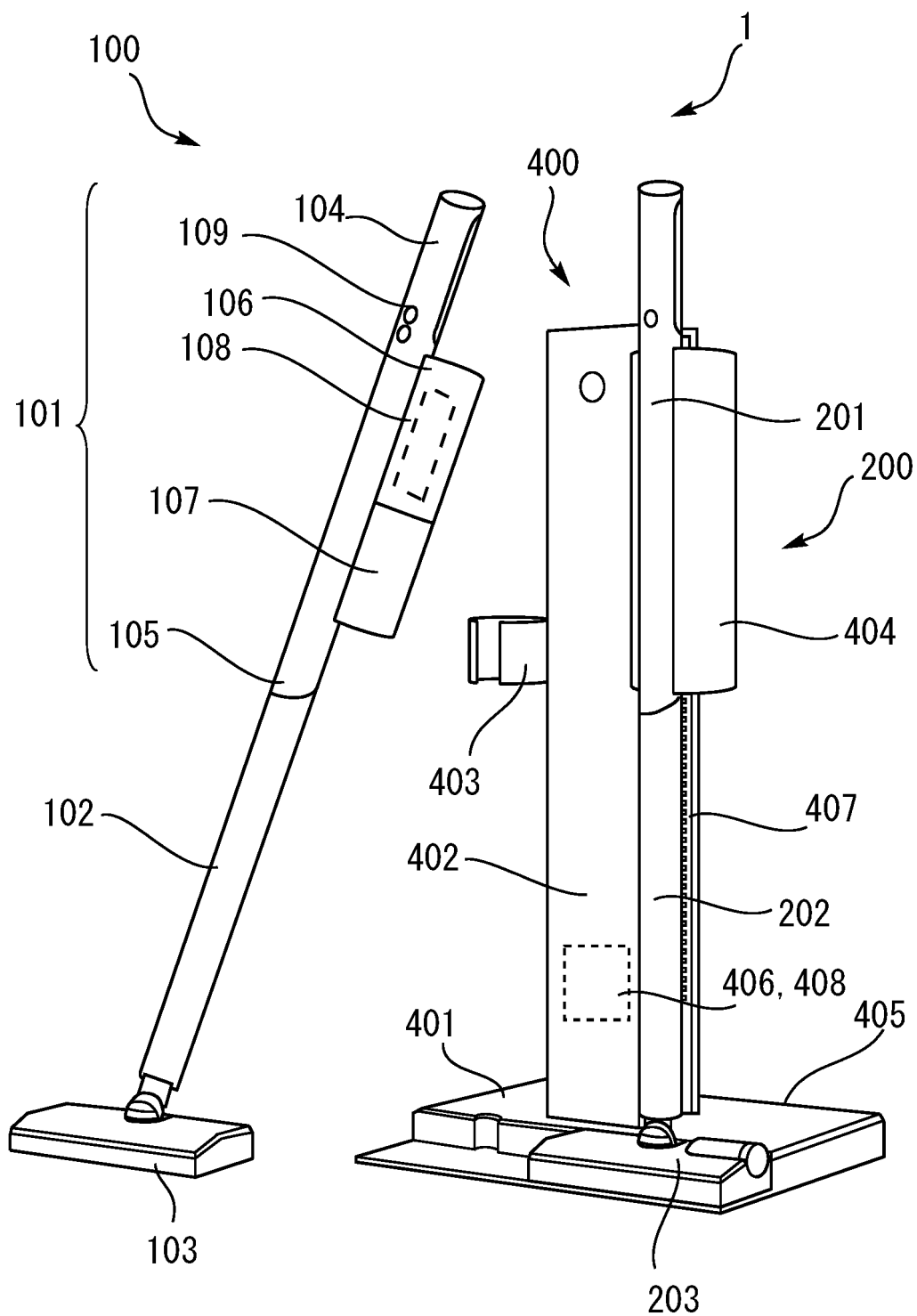


FIG. 3

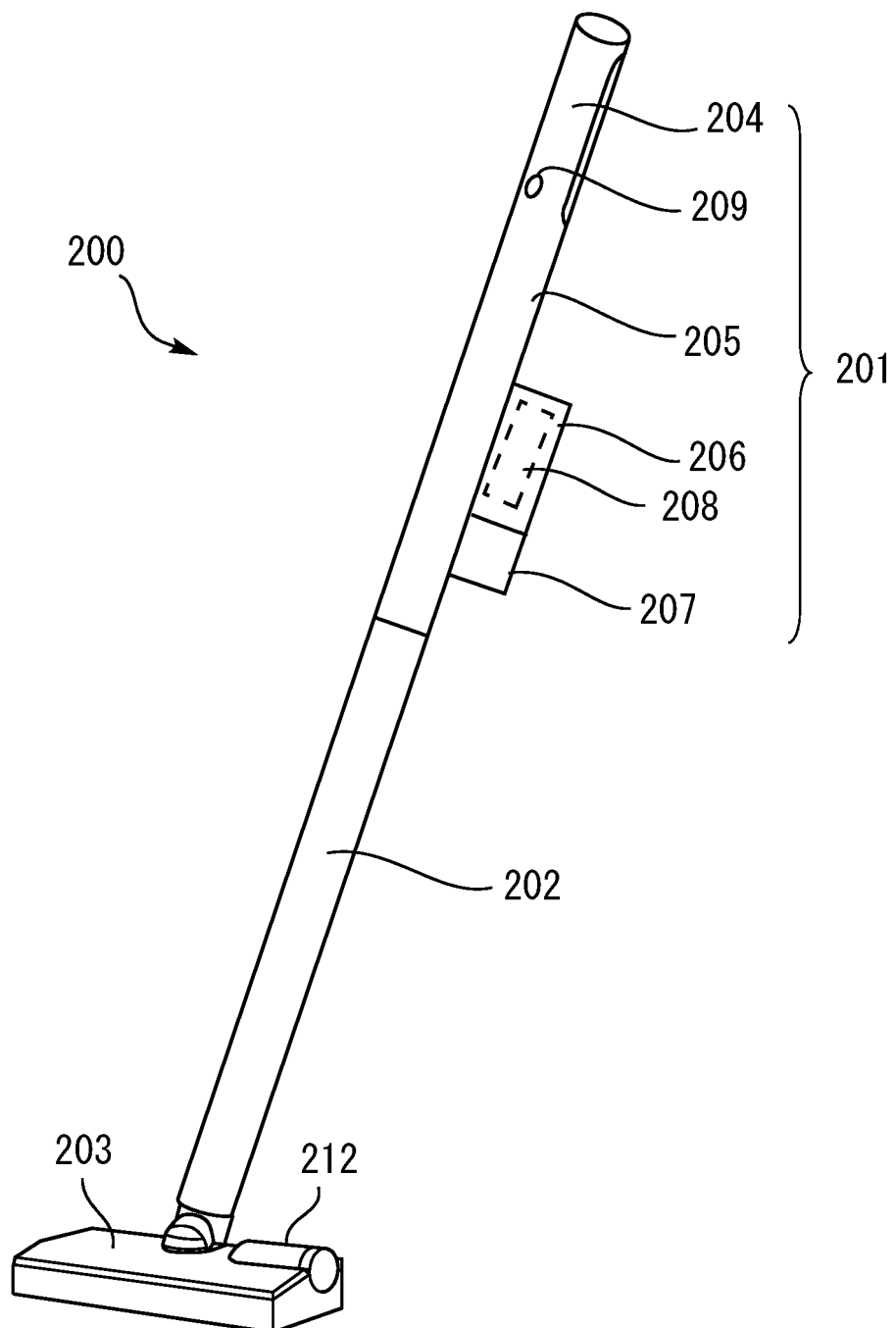


FIG. 4

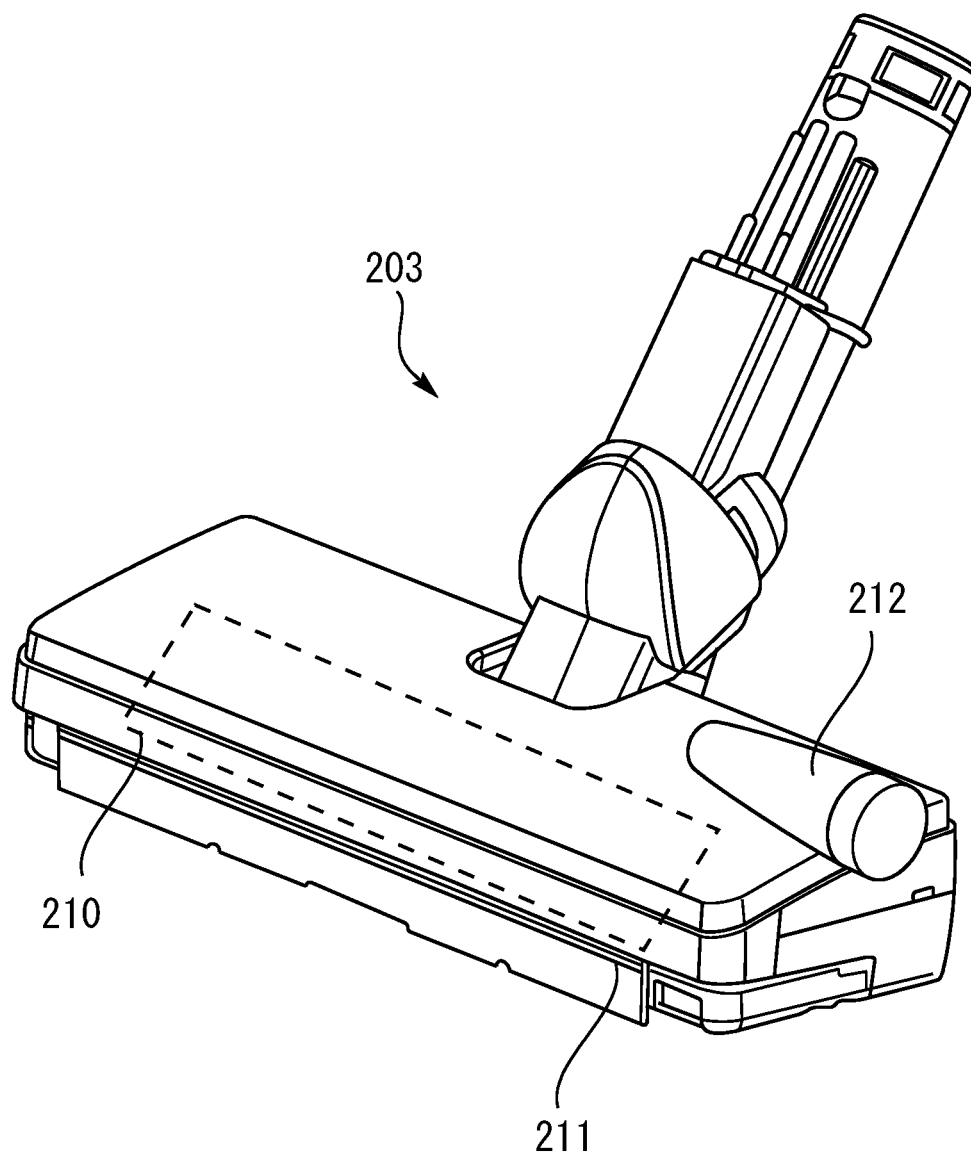


FIG. 5

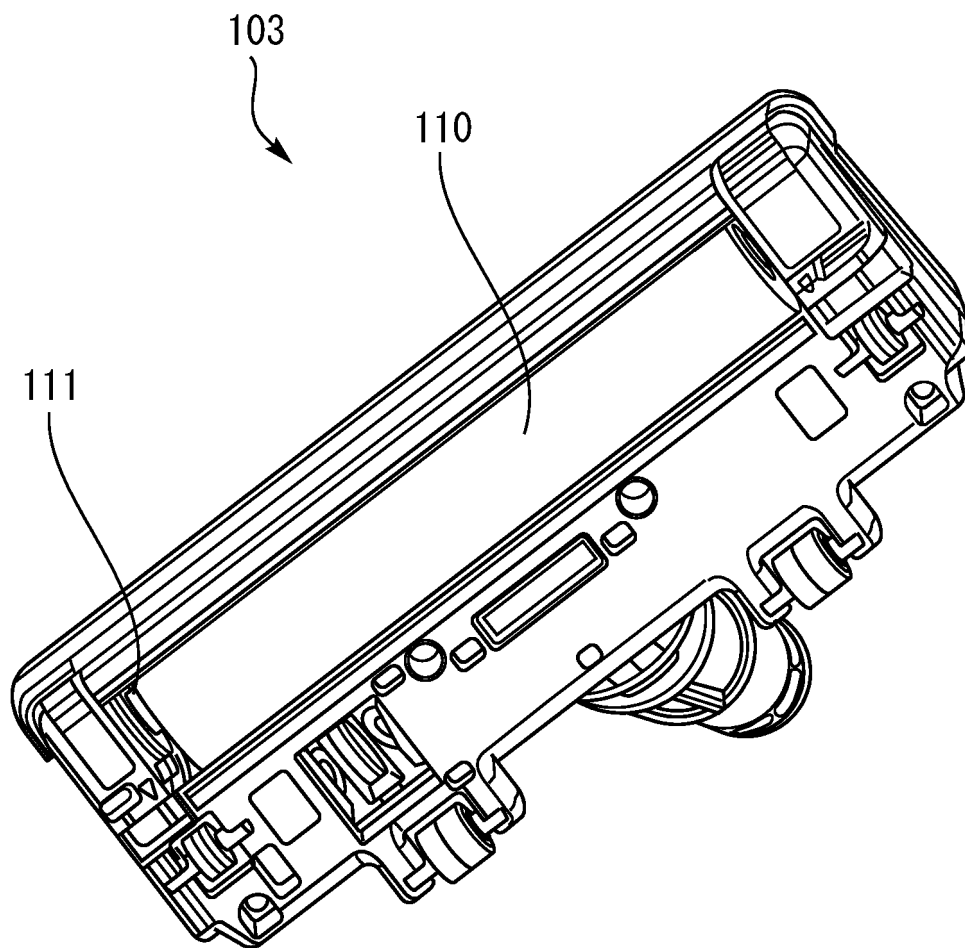


FIG. 6

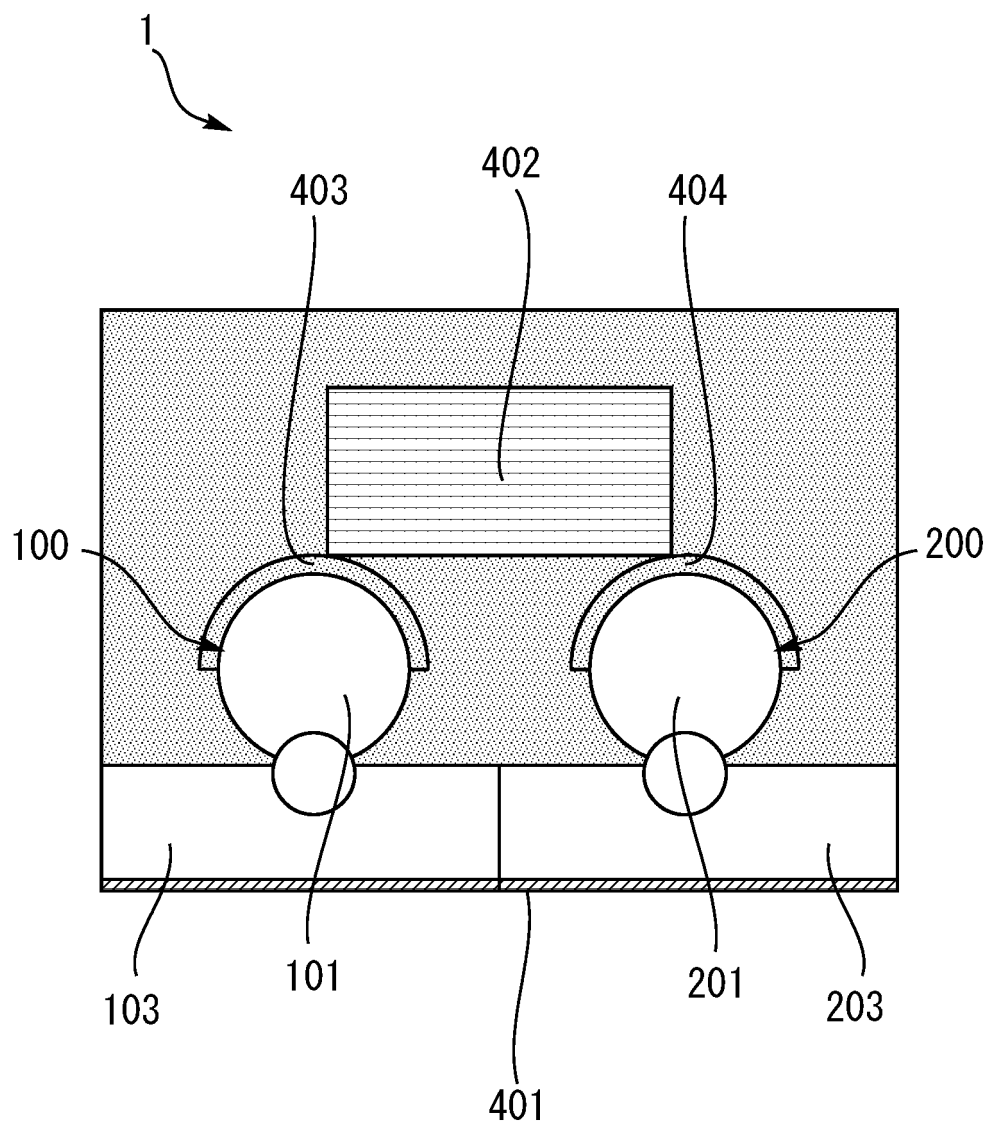


FIG. 7

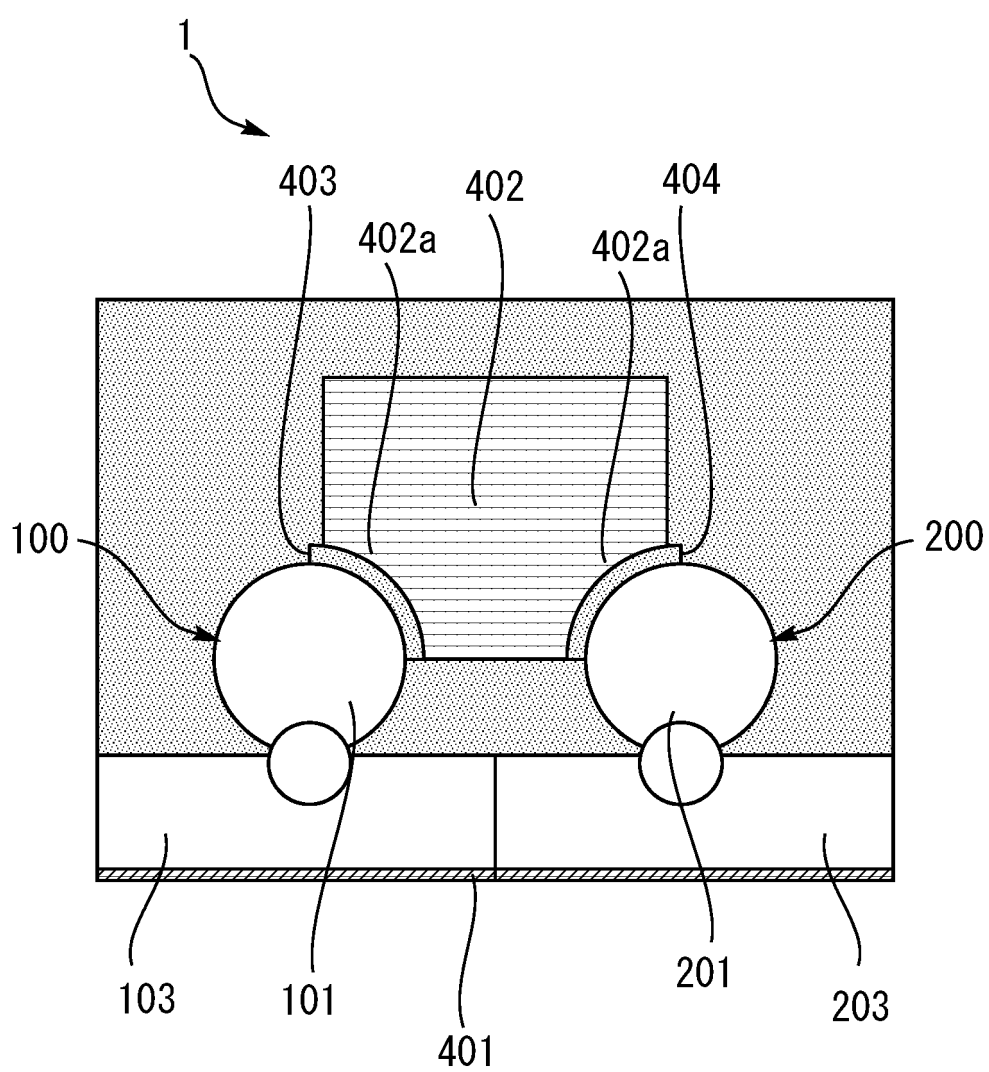


FIG. 8

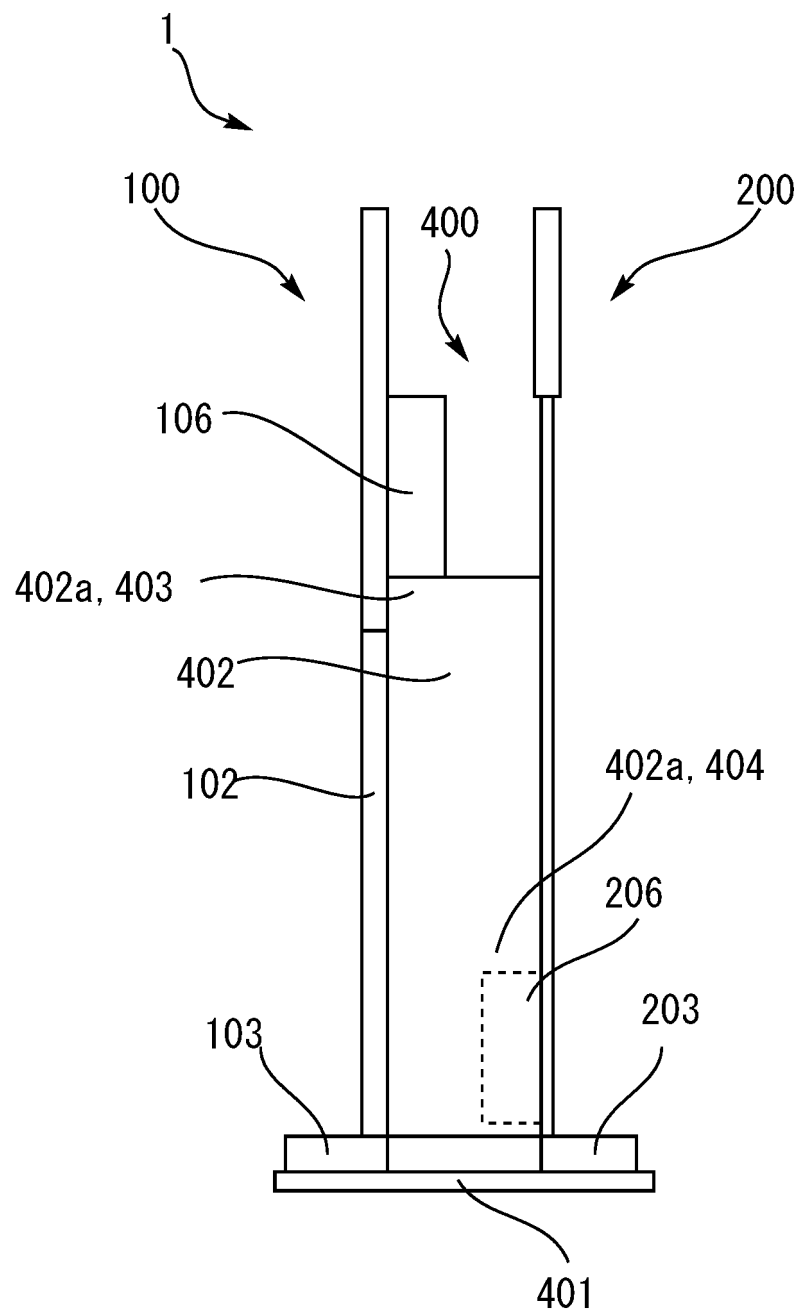


FIG. 9

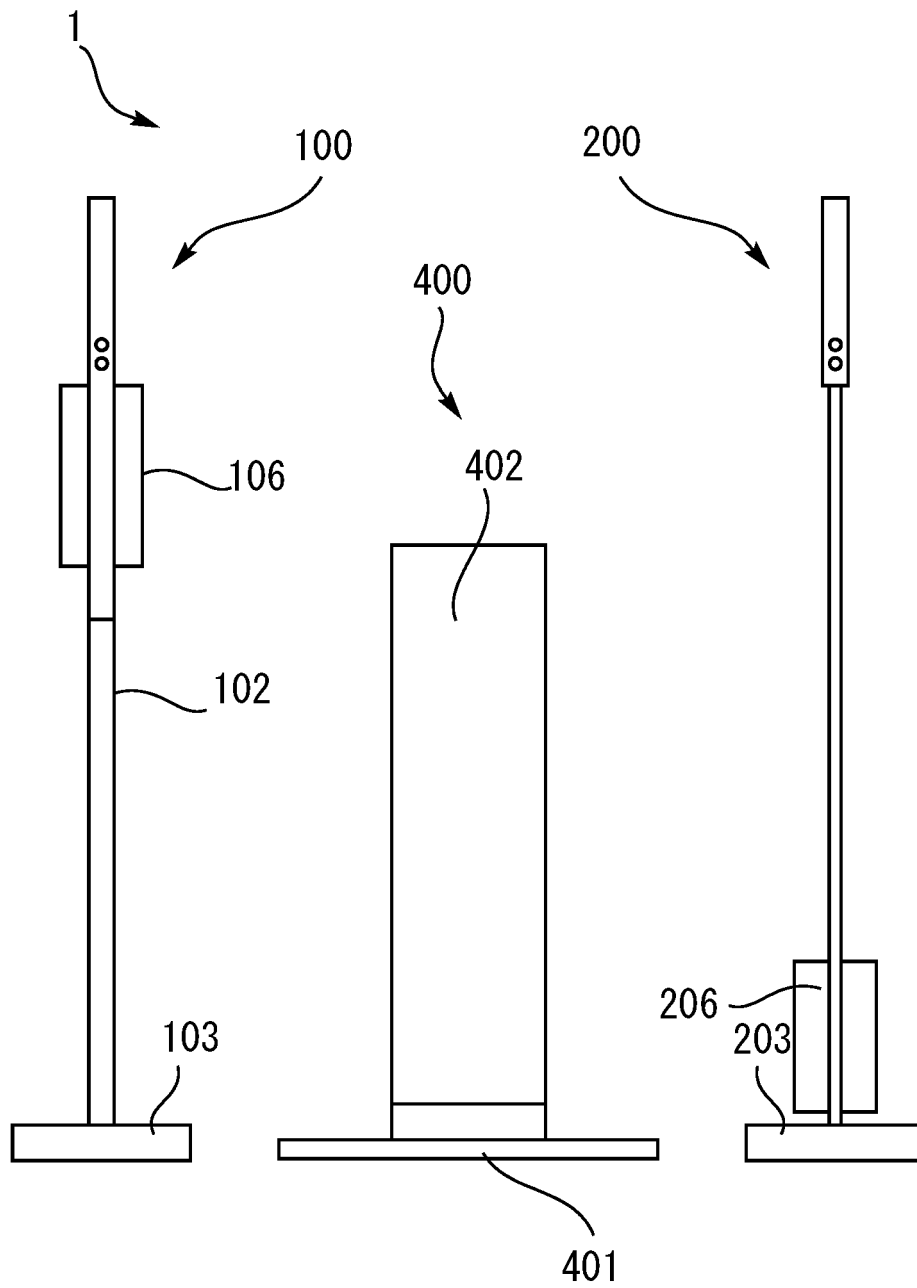


FIG. 10

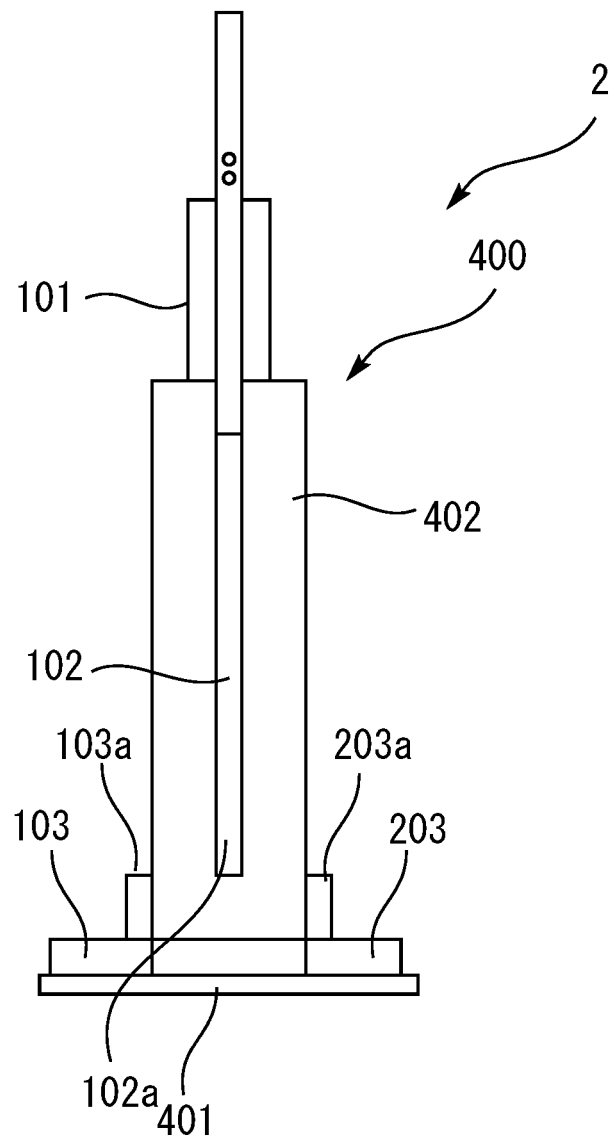


FIG. 11

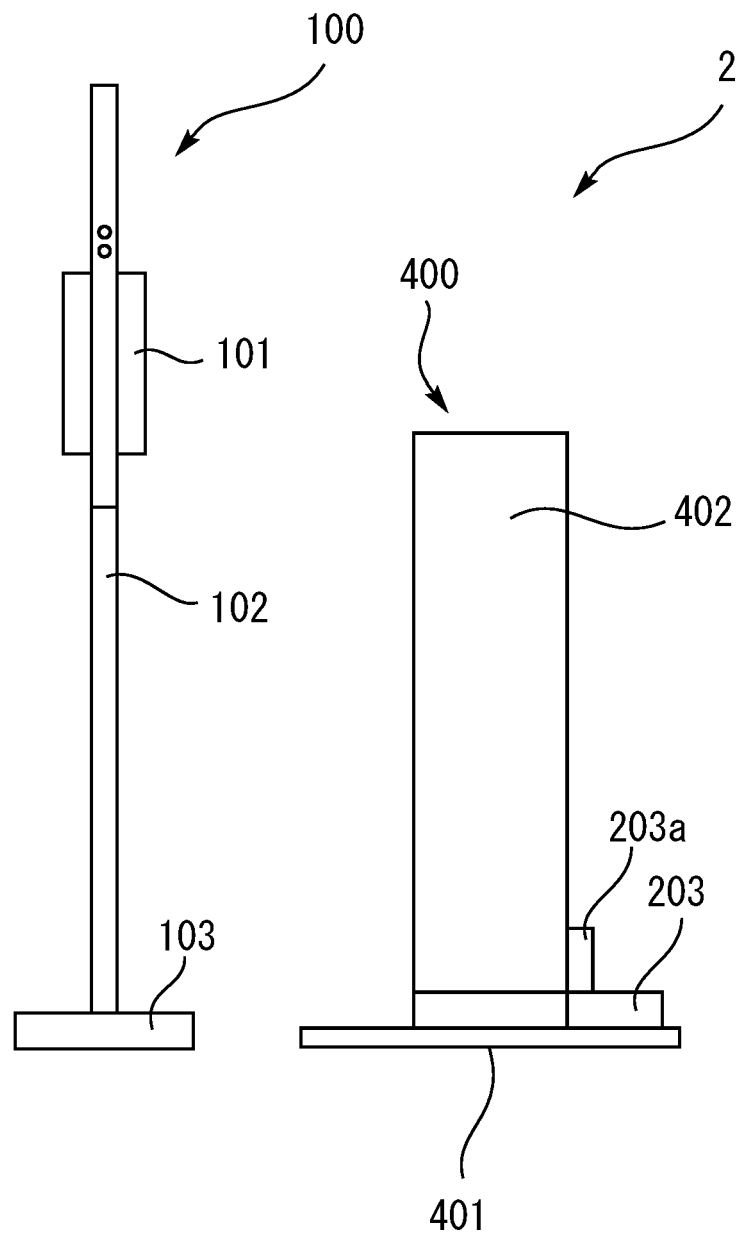
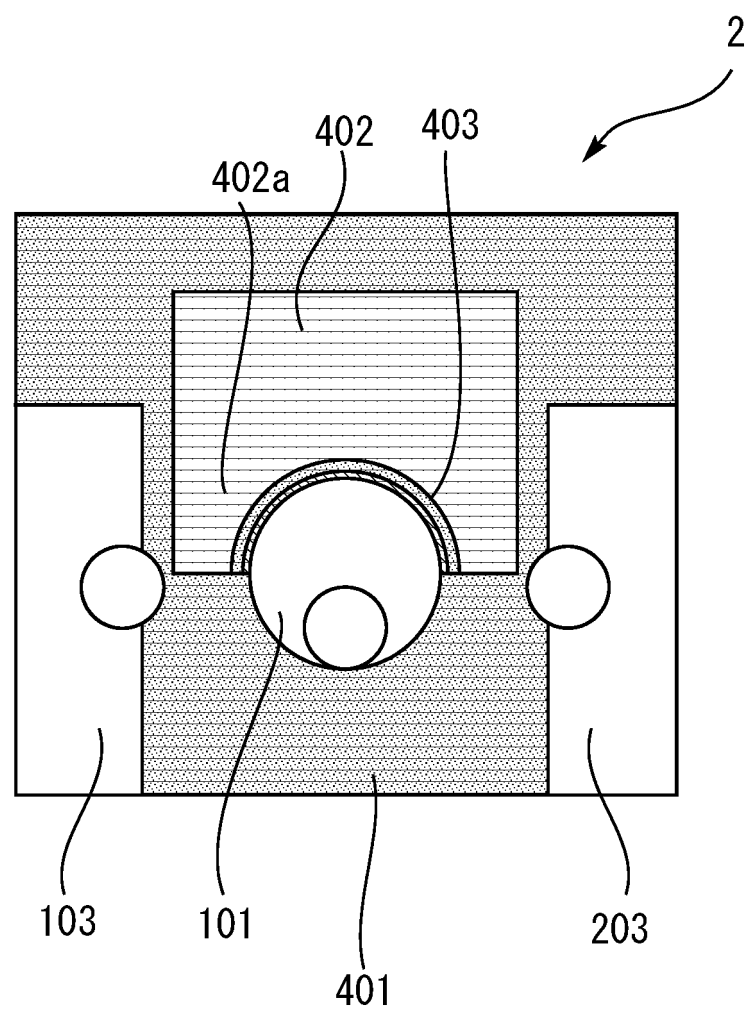


FIG. 12



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/040341

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. A47L9/00 (2006.01) i, A47L9/28 (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)

Int.Cl. A47L9/00, A47L9/28

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2018

Registered utility model specifications of Japan 1996-2018

Published registered utility model applications of Japan 1994-2018

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2004-89241 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 25 March 2004, paragraphs [0017]-[0019], [0029]-[0031], fig. 1, 2, 8, 10 (Family: none)	1-5, 10-11, 13-15
Y	WO 2016/114042 A1 (MITSUBISHI ELECTRIC CORPORATION) 21 July 2016, paragraphs [0004]-[0007], [0011]-[0077], fig. 1-26 & TW 201635964 A	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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"I"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

25.12.2018

Date of mailing of the international search report

22.01.2019

Name and mailing address of the ISA/

Japan Patent Office

3-4-3, Kasumigaseki, Chiyoda-ku,

Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/040341

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2017/0319037 A1 (LG ELECTRONICS INC.) 09 November 2017, paragraphs [0028]-[0070], fig. 1-10 & KR 10-2017-0126377 A & KR 10-2017-0126378 A & KR 10-2017-0126379 A & KR 10-2017-0126380 A & KR 10-2017-0126381 A & KR 10-2017-0126385 A & KR 10-2017-0126387 A & CN 207444901 U & CN 207444895 U & CN 207444894 U & CN 207768302 U	6-10, 12-15
Y	US 2005/0076468 A1 (ROYAL APPLIANCE MFG. CO.) 14 April 2005, paragraphs [0055]-[0059], fig. 11, 12 (Family: none)	14-15
A	DE 102010038095 A1 (VORWERK & CO. INTERHOLDING GMBH) 12 April 2012 (Family: none)	1-15
A	JP 2005-110787 A (DUSKIN CO., LTD.) 28 April 2005 (Family: none)	1-15
A	CN 106923745 A (SUZHOU EUP ELECTRIC CO., LTD.) 07 July 2017 (Family: none)	1-15

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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