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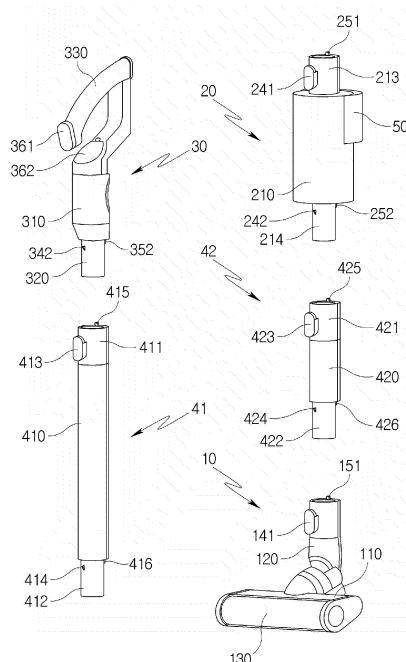
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(54) **MODULAR CLEANER**

(57) The present invention relates to a modular cleaner which has each constituent component modularized to have the connecting order changed in accordance with a usage condition or be used by selecting and coupling only the necessary constituents, the modular cleaner comprising: a body unit having a motor and an impeller therein to generate a suction force, and having a dust collecting part for storing impurities; a battery unit provided on the body unit and for applying a power source to the motor and impeller; a handle unit which can be detached from the body unit and has a grip part which can be held by a user; and a cleaning unit applying physical force to an object to be cleaned by coming into contact with the object to be cleaned, wherein coupling parts for coupling with the handle unit or cleaning unit are provided on both end parts of the body unit.

[FIG. 2]



EP 4 226 830 A1

Description

[Technical Field]

[0001] The disclosure relates to a modular cleaner, and more particularly, to a modular cleaner capable of changing a connection order according to usage conditions by modularizing each constituent component, or selecting and combining only necessary constitutions for use.

[Background Art]

[0002] The cleaner is a device which suctions or wipes dust or foreign matter in a region to be cleaned to perform a cleaning.

[0003] Such a cleaner can be classified into a manual cleaner for performing cleaning while a user directly moves the cleaner and an automatic cleaner for performing cleaning while traveling itself.

[0004] The manual cleaner can be classified into a canister type cleaner, an upright type cleaner, a handy type cleaner, a stick type cleaner and the like, according to the type of the cleaner.

[0005] Korean Patent Application Publication No. 2016-0026122 (hereinafter referred to as 'Patent Document 1') discloses a handy type cleaner. The vacuum cleaner disclosed in Patent Document 1, which is a handy type cleaner, includes a suction nozzle, a vacuum cleaning unit, an extension tube assembly, and a handle.

[0006] The vacuum cleaning unit is provided with a suction motor generating a suction force and a dust container, and is connected to a handle.

[0007] The vacuum cleaner disclosed in Patent Document 1 corresponds to a cleaner having a center of gravity at an upper portion positioned on the handle side since the vacuum cleaning unit equipped with the suction motor is integrally formed with the handle portion,

[0008] As described above, the cleaner having the center of gravity at the upper position has inconvenience in that a heavy moment load is applied to the user when cleaning a floor.

[0009] Further, Chinese Patent Application Publication No. 110432820 (hereinafter referred to as 'Patent Document 2') and Korean Patent Application Publication No. 2020-0098571 (hereinafter referred to as 'Patent Document 3') disclose constitutions capable of changing a center of gravity of a cleaner. That is, with the above constitutions, the user can change the position of the suction module equipped with the motor.

[0010] In Patent Document 2, the suction module is constituted to be separated and fastened to the handle positioned on the upper side or fastened to the cleaner side positioned on the lower side. That is, the user can change the center of gravity to one of the two centers of gravity, the upper center of gravity and the lower center of gravity for using.

[0011] However, in the constitution such as Patent Document 2, since an internal flow path must be varied

according to the position fastened to the suction module, there is a problem in the complexity of the flow path structure.

[0012] In Patent Document 3, the suction module is constituted to slide and move in a longitudinal direction so that the center of gravity can be changed for using. That is, the user can set the center of gravity to a desired center of gravity by fixing the suction module at a desired position while sliding and moving it for using.

[0013] However, in the constitution such as Patent Document 3, since a suction passage must be changed in response to the sliding movement of the suction module, there is a problem in the complexity of the structure of the suction passage. In addition, since a rail structure for sliding the suction module has to be provided separately, the structure becomes complicated and the weight of the cleaner becomes heavy.

[0014] In addition, Korean Patent Application Publication No. 2018-0076257 (hereinafter referred to as 'Patent Document 4') discloses a modular wireless vacuum cleaner.

[0015] Patent Document 4 discloses a cleaner having a structure in which a cleaner body is divided into a suction module, a collecting module, a driving module, and a handle module, respectively, and which can be changed by the selection, detachment and attachment of each module specification according to a user's selection.

[0016] However, although the cleaner disclosed in Patent Document 4 can change the center of gravity by changing the length of the cleaner by adding a dummy module between the drive module and the handle module, components other than the dummy module are assembled in a specified order.

[0017] Accordingly, the center of gravity of the cleaner cannot be changed because the position of the driving module cannot be changed in a state in which the additional dummy module is not used.

[Disclosure]

[Technical Problem]

[0018] The disclosure has been devised to solve the above problems, and an object of the disclosure is to provide a modular cleaner that can be used by changing the center of gravity of the cleaner in various ways by modularizing each constituent component and changing the connection order of each constituent component.

[0019] Further, according to the disclosure, it is an object to provide a modular cleaner that can be used by changing the length and center of gravity of the cleaner by modularizing each constituent component and selecting and combining only necessary constitutions according to usage conditions.

[Technical Solution]

[0020] A modular cleaner according to an embodiment of the disclosure includes a body unit that includes a motor and an impeller therein to generate a suction force, and a dust collecting part to store dirt; a battery unit that is provided on the body unit and applies a power source to the motor and impeller; a handle unit that is detachable from the body unit and includes a grip part capable of being gripped by a user; and a cleaning unit that comes into contact with an object to be cleaned to apply a physical force to the object to be cleaned, wherein coupling parts for coupling with the handle unit or cleaning unit are provided on both ends of the body unit.

[0021] Through this, respective constituent components are made to be separated and assembled from each other.

[0022] Here, when the coupling part of the body unit is coupled to the handle unit or the cleaning unit, at least one of the body unit and the handle unit or the body unit and the cleaning unit is electrically connected to each other.

[0023] In addition, the modular cleaner according to an embodiment of the disclosure includes a connection unit that is disposed on at least one of a position between the cleaning unit and the body unit and a position between the body unit and the handle unit to connect the body unit to the cleaning unit or the body unit to the handle unit.

[0024] That is, the connection order of respective constituent components can be changed by changing the coupling and coupling positions of the connection unit, so that the center of gravity of the cleaner can be varied and used according to the user's selection.

[0025] Here, when the coupling part of the connection unit is coupled to the cleaning unit or the handle unit, the cleaning unit or the handle unit is electrically connected to the body unit through the coupling part of the connection unit. Thus, even if the connection order of the respective constituent components is changed, all of them can be electrically connected.

[0026] As an example, the connection unit may include a first connection part; and a second connection part formed to be shorter in length than the first connection part.

[0027] Each of the first connection part and the second connection part may connect between the body unit and the cleaning unit or between the body unit and the handle unit.

[0028] That is, a connection may be formed between the body unit and the cleaning unit or between the body unit and the handle unit in a state in which the first connection part and the second connection part are coupled to each other.

[0029] In addition, in a state where the first connection part and the second connection part are separated from each other, the first connection part and the second connection part may be disposed at different positions among between the body unit and the cleaning unit and

between the body unit and the handle unit to connect respective constitutions.

[0030] Furthermore, only one of the first connection part and the second connection part may connect between the body unit and the cleaning unit or between the body unit and the handle unit.

[0031] Through this, the center of gravity of the cleaner can be freely changed through selective connection and a change in the connection position of the first connection part and the second connection part.

[0032] The cleaning unit may be detachably provided with a cleaning mop capable of wiping a floor surface.

[0033] The battery unit may be detachably provided in the body unit.

[0034] In addition, the battery unit is provided with at least one, and the at least one battery unit may be fastened to at least one of the body unit, the cleaning unit, the handle unit, and the connection unit.

[0035] As an example, the battery unit may be fastened to be positioned on a rear surface of each constitution facing a floor surface in a state in which the cleaning unit is disposed in a straight line without being rotated.

[0036] In addition, the battery unit may be fastened to be positioned on both sides of each constitution.

[0037] In addition, a modular cleaner according to an embodiment of the disclosure may include a cleaner body that receives the power source through a wire and provides the suction force; and a connection hose provided in the cleaner body.

[0038] Here, the handle unit is connected to the body unit so that the cleaner may be used as a handy type cleaner, or the handle unit is connected to the connection hose so that the cleaner may be used as a canister type cleaner.

[0039] That is, according to the user's selection, in the case that the cleaner is used as the handy type cleaner, the handle unit may be connected to the body unit, and in the case that the cleaner is used as the canister type cleaner, the handle unit may be connected to the connection hose. Here when used as the canister type cleaner, the body unit is not connected.

[Advantageous Effect]

[0040] According to the modular cleaner according to the disclosure, the center of gravity of the cleaner can be changed in various ways by modularizing respective constituent components and changing the connection order of respective constituent components, thereby improving convenience of use.

[0041] Further, according to the disclosure, the length and center of gravity of the cleaner can be changed by selecting and combining only necessary constitutions according to the user's physical condition and cleaning environmental conditions, thereby improving usability.

[Description of Drawings]**[0042]**

FIG. 1 is a perspective view schematically illustrating a modular cleaner according to an embodiment of the disclosure,

FIG. 2 is an exploded perspective view schematically illustrating a modular cleaner according to an embodiment of the disclosure,

FIG. 3 is a perspective view schematically illustrating a state of a modular cleaner according to an embodiment of the disclosure in which a connection is made of an upper center of gravity and middle upper center of gravity,

FIG. 4 is a perspective view schematically illustrating a state of a modular cleaner according to an embodiment of the disclosure in which a connection is made of a middle lower center of gravity and lower center of gravity,

FIG. 5 is a perspective view schematically illustrating a state of a modular cleaner according to an embodiment of the disclosure in which a second connection part is excluded and a connection is made of an upper center of gravity and lower center of gravity,

FIG. 6 is a perspective view schematically illustrating a state of a modular cleaner according to an embodiment of the disclosure in which a first connection part is excluded and a connection is made of an upper center of gravity and lower center of gravity,

FIG. 7 is a perspective view schematically illustrating a state of a modular cleaner according to an embodiment of the disclosure in which a connection is made while a connection unit is excluded,

FIG. 8 is a perspective view schematically illustrating a state of a modular cleaner according to an embodiment of the disclosure in which a cleaning mop is provided in a cleaning unit,

FIG. 9 is a cross-sectional view schematically illustrating a body unit taken out of a modular cleaner according to an embodiment of the disclosure,

FIGS. 10 and 11 are views schematically illustrating positions where a battery unit is fastened in a modular cleaner according to another embodiment of the disclosure,

FIG. 12 is a perspective view schematically illustrating a constitution in which a battery unit is fastened, taken out of a modular cleaner according to another embodiment of the disclosure,

FIG. 13 is a perspective view schematically illustrating a state of use of a modular cleaner according to another embodiment of the disclosure,

FIG. 14 is a cross-sectional view schematically illustrating a handle unit taken out of a modular cleaner according to another embodiment of the disclosure.

[Mode for Invention]

[0043] Hereinafter, preferred embodiments of the disclosure will be described in detail with reference to the accompanying drawings.

[0044] Since the disclosure can have various changes and can have various embodiments, specific embodiments are illustrated in the drawings and will be described in detail in the detailed description. This is not intended to limit the disclosure to specific embodiments, and should be construed to include all modifications, equivalents, and substitutes included in the spirit and scope of the disclosure.

[0045] In describing the disclosure, terms such as first and second may be used to describe various components, but the components may not be limited by the terms. The above terms are only for the purpose of distinguishing one component from another. For example, without departing from the scope of the disclosure, a first component may be referred to as a second component, and similarly, a second component may also be referred to as a first component.

[0046] The term "and/or" may include a combination of a plurality of related listed items or any of a plurality of related listed items.

[0047] When a component is referred to as being "connected" or "contacted" to another component, it can be understood that it may be directly connected or contacted to the other component, but other components may exist in between. On the other hand, when a component is referred to as being "directly connected" or "directly contacted" to another component, it may be understood that another component does not exist in between.

[0048] The terms used in the application are only used to describe specific embodiments, and are not intended to limit the disclosure. The singular expression may include the plural expression unless the context clearly dictates otherwise.

[0049] In the application, terms such as "comprise" or "have" are intended to designate that a feature, number, step, operation, component, part, or combination thereof described in the specification exists, and one or more other features, and it may be understood that this does not preclude the possibility of addition or existence of one or more other features, numbers, steps, operations, components, parts, or combinations thereof.

[0050] Unless defined otherwise, all terms used herein, including technical or scientific terms, may have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. Terms such as those defined in a commonly used dictionary may be interpreted as having a meaning consistent with the meaning in the context of the related art, and unless explicitly defined in the present application, it may not be construed in an ideal or overly formal sense.

[0051] In addition, the following embodiments are provided to more completely explain to those of ordinary skill in the art, and the shapes and sizes of elements in the

drawings may be exaggerated for clearer explanation.

[0052] Hereinafter, specific embodiments of the disclosure will be described with reference to the accompanying drawings.

[0053] FIGS. 1 and 2 are perspective and exploded perspective views schematically illustrating a modular cleaner according to an embodiment of the disclosure, and FIGS. 3 and 4 are perspective views schematically illustrating a state of the modular cleaner in which a connection is made with different centers of gravity.

[0054] Further, FIGS. 5 and 6 are perspective views schematically illustrating a state in which a second connection part and a first connection part are excluded from the modular cleaner and a connection is made with different centers of gravity, and FIGS. 7 and 8 are perspective views schematically illustrating a state in which a connection is made while a connection unit is excluded from the modular cleaner.

[0055] Further, FIG. 9 is a cross-sectional view schematically illustrating a body unit taken out of the modular cleaner.

[0056] Referring to FIGS. 1 to 4, a modular cleaner 1 according to an embodiment of the disclosure may include a body unit 20 that is provided with a driving part for providing a suction force and a dust collecting part for storing dirt, a handle unit 30 that is gripped by a user, a connection unit 40 that connects respective constitutions and includes a hollow so that sucked air can flow, a cleaning unit 10 that contacts an object to be cleaned to apply a physical force to the object to be cleaned, and a battery unit 50 that is provided in the body unit 20 and applies a power source to the driving part.

[0057] In addition, the cleaning unit 10, the body unit 20, the handle unit 30, and the connection unit 40 are all unified in fastened parts so that all constitutions can be connected to each other. That is, all constitutions are provided with coupling parts for coupling with each other.

[0058] Here, the body unit 20 and the connection unit 40 are provided with female fastening parts and male fastening parts, which are coupling parts, on both sides, so that they may be fastened by changing the order of each other.

[0059] In addition, since the cleaning unit 10 is positioned at the lowermost end of the modular cleaner 1, only one female fastening part or male fastening part as a coupling part may be provided.

[0060] In addition, since the handle unit 30 is positioned at the uppermost end of the modular cleaner 1, only one male fastening part or female fastening part as a coupling part may be provided.

[0061] That is, the cleaning unit 10 and the handle unit 30 are positioned at both ends of the modular cleaner 1, and the order in which the body unit 20 and the connection unit 40 are connected is changed so that the position where the body unit 20 is disposed may be changed.

[0062] The body unit 20 is provided with a driving part 220, a dust collecting part 230, and a battery unit 50, so that it is the heaviest constitution in the modular cleaner

1. Thus, the center of gravity of the modular cleaner 1 is changed according to a position where the body unit 20 is connected.

[0063] Through this, the user can selectively change the position where the body unit 20 is disposed to change the center of gravity of the modular cleaner 1 according to the usage environment, thereby improving usability.

[0064] Therefore, in the modular cleaner 1 according to an embodiment of the disclosure, the center of gravity of the modular cleaner 1 can be changed according to the user's convenience by changing the connection position of the body unit 20.

[0065] Hereinafter, a connection relationship between respective constitutions capable of changing the center of gravity of the modular cleaner 1 according to an embodiment of the disclosure will be described in more detail.

[0066] The modular cleaner 1 described below includes the cleaning unit 10, the body unit 20, the handle unit 30, the battery unit 50, and the connection unit 40. The battery unit 50 is fastened to the body unit 20.

[0067] The connection unit 40 includes a hollow inside for fluid movement, and includes a coupling part for coupling with at least one of the cleaning unit 10, the body unit 20, and the handle unit 30.

[0068] Further, when the coupling part of the connection unit 40 is coupled to the cleaning unit 10 or the handle unit 30, the cleaning unit 10 or the handle unit 30 is electrically connected to the body unit 20 through the coupling part of the connection unit 40. That is, the connection unit 40 is a constitution that electrically connects other constitutions while mechanically connecting other constitutions.

[0069] The connection unit 40 may include, for example, a first connection part 41 and a second connection part 42 having different lengths. In addition, the second connection part 42 is shorter than the first connection part 41.

[0070] The configuration of the connection unit 40 is not limited thereto, and a plurality of connection parts having the same length may be provided, and the connection parts may be fastened by varying the length of the connection by changing the number and order of coupling of the connection parts.

[0071] FIGS. 3 and 4 are views illustrating a state in which the position of the body unit 20 is changed and fastened in the modular cleaner 1 according to an embodiment of the disclosure.

[0072] Referring to (a) in FIG. 3, after the first connection part 41 and the second connection part 42 are sequentially connected to the cleaning unit 10, the body unit 20 is connected to the second connection part 42, and then the handle unit 30 is connected to the body unit 20.

[0073] Here, the order in which the first connection part 41 and the second connection part 42 are connected to each other may be changed.

[0074] In this case, the first connection part 41 and the

second connection part 42 are used for the purpose of air flow and the purpose of extending the length between the cleaning unit 10 and the body unit 20.

[0075] Since the driving part 220 and the dust collecting part 230 are disposed inside the body unit 20 and the battery unit 50 is fastened therein, the body unit 20 has a larger diameter than that of other constitutions.

[0076] In this way, when the body unit 20 having the largest diameter is positioned on the uppermost side, it is advantageous to clean a gap space.

[0077] As an example, in the case where the cleaning unit 10 is introduced into a gap between a floor surface and a furniture in a space where furniture such as a bed or sofa is installed for cleaning, the cleaning unit 10 must be introduced into a deeper space.

[0078] In this case, if the body unit 20 having a relatively large diameter is disposed close to the cleaning unit 10, the body unit 20 prevents the cleaning unit 10 from being introduced into a deeper space, thereby making a cleaning space narrow.

[0079] Therefore, since the first connection part 41 and second connection part 42 having a relatively small diameter connect the cleaning unit 10 and the body unit 20, the cleaning unit 10 can be introduced into the deepest space to be cleaned.

[0080] In addition, since the driving part 220 and the dust collecting part 230 are disposed inside the body unit 20 and the battery unit 50 is fastened therein, the body unit 20 is the heaviest constitution compared to other constitutions.

[0081] In this way, the heaviest body unit 20 is positioned on the uppermost side, so the cleaner has an upper center of gravity.

[0082] In the case of using the modular cleaner 1 with the connection of the upper center of gravity, since the center of gravity is close to the user side when the user holds and uses the modular cleaner 1, the feeling of weight in use can be reduced.

[0083] For example, when cleaning walls, tables, window frames, ceilings, etc., the user lifts the cleaner and uses it. In this case, the center of gravity is positioned close to the handle unit 30 side, so that the user can stably operate the cleaner.

[0084] Referring to (b) in FIG. 3, after the first connection part 41 is connected to the cleaning unit 10, the body unit 20 is connected to the first connection part 41, and then the body unit 20 and the handle unit 30 are connected by the second connection part 42.

[0085] In this case, the first connection part 41 is used for the purpose of air flow and the purpose of extending the length between the cleaning unit 10 and the body unit 20, and the second connection part 42 is used for the purpose of extending the length between the body unit 20 and the handle unit 30.

[0086] With this constitution, the cleaner may be connected and used so as to have a middle upper center of gravity in which the center of gravity is moved lower than the upper center of gravity described above.

[0087] In the case of the upper center of gravity, since the center of gravity is formed close to the handle unit 30 side, the feeling of weight on the cleaning unit 10 side is relatively reduced, so that the cleaning unit 10 side can be easily shaken.

[0088] In comparison, in the case of the middle upper center of gravity, since the center of gravity moves lower than the upper center of gravity, the feeling of weight is more weighted toward the cleaning unit 10 side, so that the moving operation on the cleaning unit 10 side can be more stabilized.

[0089] Further, when cleaning the floor surface, the moment load applied to the handle unit 30 is greater in the cleaner having the connection of the upper center of gravity than the cleaner having the connection of the middle upper center of gravity, so that the user must hold the handle unit 30 with more force when the user uses the cleaner having the connection of the upper center of gravity.

[0090] Therefore, when the modular cleaner 1 is used with the connection of the middle upper center of gravity, the cleaner can be operated more lightly than the cleaner with the connection of the upper center of gravity, thereby improving comfort and reducing fatigue during operation.

[0091] In addition, when cleaning walls, tables, window frames, ceilings, etc., the user lifts and uses the cleaner. In this case, the user may hold the body unit 20 with one hand and hold the handle unit 30 with the other hand to clean.

[0092] In this case, since the user holds and operates the body unit 20, which is the heaviest component, the cleaner can be operated more stably.

[0093] Even in the case of the upper center of gravity, the user can hold the body unit 20 with one hand while holding the handle unit 30 with the other hand to clean.

[0094] Referring to (a) in FIG. 4, after the second connection part 42 is connected to the cleaning unit 10, the body unit 20 is connected to the second connection part 42, and the body unit 20 and the handle unit 30 may be connected by the first connection part 41.

[0095] Here, the second connection part 42 is used for the purpose of air flow and the purpose of extending the length between the cleaning unit 10 and the body unit 20, and the first connection part 41 is used for the purpose of extending the length between the body unit 20 and the handle unit 30.

[0096] With this constitution, the cleaner can be used with a connection of a middle lower center of gravity in which the center of gravity is moved lower than the middle upper center of gravity described above.

[0097] In this case, since the moment load applied to the handle unit 30 is smaller than that in the cleaner with the connection of the middle upper center of gravity, the user may hold the handle unit 30 with less force than when using the cleaner with the connection of the middle upper center of gravity.

[0098] However, since the center of gravity is positioned close to the cleaning unit 10, in order for the user

to rotate the cleaning unit 10 to a desired position by twisting the handle unit 30, more force is required than in the case of the cleaner with the connection of the middle upper center of gravity.

[0099] Therefore, among the connection of the middle upper center of gravity and the connection of the middle lower center of gravity, the connection of the center of gravity that the user can feel more comfortable according to the user's physical condition and the cleaning environment can be used.

[0100] Referring to (b) in FIG. 4, after the body unit 20 is directly connected to the cleaning unit 10, and the first connection part 41 and the second connection part 42 are sequentially connected to the body unit 20. Then, the handle unit 30 is connected to the second connection part 42.

[0101] Here, the order in which the first connection part 41 and the second connection part 42 are connected to each other may be changed.

[0102] Also, the first connection part 41 and the second connection part 42 are used to extend the length between the body unit 20 and the handle unit 30.

[0103] With this constitution, the cleaner may be used with the connection of the lower center of gravity whose center of gravity is moved lower than in the middle lower center of gravity described above.

[0104] In this case, since the moment load applied to the handle unit 30 is smaller than that of the cleaner with the connection of the middle lower center of gravity, the user may hold the handle unit 30 with less force than when using the cleaner with the connection of the middle lower center of gravity.

[0105] However, since the center of gravity is positioned close to the cleaning unit 10, in order for the user to rotate the cleaning unit 10 to a desired position by twisting the handle unit 30, more force is required than in the case of the cleaner with the connection of the middle lower center of gravity.

[0106] Therefore, among the connection of the middle lower center of gravity and the connection of the lower center of gravity, the cleaner with the connection of the center of gravity that the user can feel more comfortable according to the user's physical condition and the cleaning environment may be used.

[0107] Furthermore, since more load can be applied to the cleaning unit 10 with lower center of gravity, as illustrated in FIG. 8, it can enhance the cleaning effect by using the cleaning unit 10 equipped with a cleaning mop 190 capable of wiping a floor surface.

[0108] That is, while rotating, the cleaning mop 190 comes into contact with the floor surface, which is an object to be cleaned, and wipes the floor surface. In this case, when a physical force of a greater load is applied to the cleaning unit 10, the cleaning mop 190 rotates in close contact with the floor surface with a stronger force, so that the cleaning performance of wiping the floor surface can be further improved.

[0109] Here, the cleaning unit 10 may be used only for

wiping an object to be cleaned by attaching only the cleaning mop 190, without a separate suction port for sucking air.

[0110] Alternatively, the cleaning unit 10 may be formed with the suction port for sucking air, and may be formed to additionally attach the cleaning mop 190. Thus, the cleaning unit 10 may perform the cleaning while wiping the dirt of the object to be cleaned with suction.

[0111] As described above, depending on the user's physical condition, such as the height and arm length of the user, and cleaning environmental conditions, such as the cleaning position and type of cleaning, the position of the center of gravity that the user feels comfort while operating the cleaner may all be different.

[0112] Therefore, since the user can directly select the center of gravity that the user can feel comfortable in operation and assemble and use respective constitutions, convenience of use can be further improved.

[0113] Referring to FIGS. 5 to 8, the modular cleaner 1 according to an embodiment of the disclosure uses the body unit 20 and the handle unit 30, but the cleaning unit 10, the first connection part 41 and the second connection part 42 may be selectively connected and used.

[0114] That is, the modular cleaner according to an embodiment of the disclosure described with reference to FIGS. 3 and 4 corresponds to an embodiment including the cleaning unit 10, the body unit 20, the handle unit 30, the first connection part 41, and the second connection part 42. However, an embodiment disclosed in FIGS. 5 to 8 corresponds to an embodiment in which some constitutions are connected and used under different conditions of use.

[0115] Referring to FIG. 5, a modular cleaner according to an embodiment of the disclosure corresponds to an embodiment using the cleaning unit 10, the body unit 20, the handle unit 30, and the first connection part 41.

[0116] Then, referring to FIG. 6, a modular cleaner according to an embodiment of the disclosure corresponds to an embodiment using the cleaning unit 10, the body unit 20, the handle unit 30, and the second connection part 42.

[0117] That is, the constitution does not use the first connection part 41 or the second connection part 42 that is used in the modular cleaner according to the embodiment of the disclosure described with reference to FIGS. 3 and 4. Through this, the length from the handle unit 30 to the cleaning unit 10 may be formed to be smaller, so that the cleaner may be used more appropriately according to the user's physical condition or cleaning environment.

[0118] Referring to (a) in FIG. 5, after the first connection part 41 is connected to the cleaning unit 10, the body unit 20 is connected to the first connection part 41. Then, the handle unit 30 is connected to the body unit 20.

[0119] Further, referring to (a) in FIG. 6, after the second connection part 42 is connected to the cleaning unit 10, the body unit 20 is connected to the second connection part 42. Then, the body unit 20 is connected to the

handle unit 30.

[0120] In this way, the heaviest body unit 20 is positioned on the uppermost side, so the cleaner has the upper center of gravity.

[0121] In the case of using the modular cleaner 1 with the connection of the upper center of gravity, since the center of gravity is close to the user side when the user holds and uses the modular cleaner 1, the feeling of weight in use can be reduced.

[0122] For example, when cleaning walls, tables, window frames, ceilings, etc., the user lifts the cleaner and uses it. In the case, when the center of gravity is positioned close to the handle unit 30 side, the user may stably operate the cleaner.

[0123] In addition, under conditions where it is advantageous to use a shorter cleaner, such as when the user is tall or where the ceiling is low, only the first connection part 41 or the second connection part 42 may be connected and used.

[0124] Referring to (b) in FIG. 5, after the body unit 20 is connected to the cleaning unit 10, the first connection part 41 is connected to the body unit 20. Then, the handle unit 30 is connected to the first connection part 41.

[0125] Further, referring to (b) in FIG. 6, after the body unit 20 is connected to the cleaning unit 10, the second connection part 42 is connected to the body unit 20. Then, the handle unit 30 is connected to the second connection part 42.

[0126] With this constitution, the cleaner may be used with the connection of the lower center of gravity whose center of gravity is moved lower than the upper center of gravity described above.

[0127] In addition, under conditions where it is advantageous to use the cleaner having a shorter length, such as when a user is short, only the first connection part 41 or the second connection part 42 may be connected and used.

[0128] In addition, in the case of the lower center of gravity, more load may be applied to the cleaning unit 10, so as illustrated in FIG. 8, the cleaning effect can be enhanced by using the cleaning unit 10 equipped with the cleaning mop 190 capable of wiping the floor surface.

[0129] Referring to FIGS. 7 and 8, a modular cleaner according to an embodiment of the disclosure corresponds to an embodiment using the cleaning unit 10, the body unit 20, and the handle unit 30. That is, this is an embodiment in which the length of the cleaner is minimized without using the connection unit 40.

[0130] Referring to (a) in FIG. 7, after the body unit 20 is connected to the cleaning unit 10, the handle unit 30 is connected to the body unit 20.

[0131] In this case, the length and weight of the cleaner may be minimized and used.

[0132] For example, it is advantageous when cleaning tables, bedding, window frames, or the like.

[0133] Although not illustrated in the drawings, when cleaning bedding, the cleaner may be used by replacing the cleaning unit with a bedding dedicated cleaning unit.

[0134] In addition, in the case that the cleaner needs to be introduced into a space with a narrow gap, such as a window frame, as illustrated in (b) in FIG. 7, the cleaning unit may be replaced with a gap dedicated cleaning unit 11 prepared in a thin and long shape.

[0135] Furthermore, referring to FIG. 8, the cleaning unit 10 equipped with the cleaning mop 190 may be used.

[0136] In the case that the connection unit 40 is not connected as illustrated in FIG. 8, the cleaner may be conveniently used when cleaning tables, windows, or the like. Also, when cleaning the floor, the connection part may be connected and used.

[0137] In this way, the user can directly adjust the length of the cleaner that the user can comfortably clean according to the user's physical conditions such as the height and arm length of the user, and the cleaning environmental conditions such as the cleaning location and cleaning type, etc., so that the convenience of use can be further improved.

[0138] Hereinafter, each configuration of the modular cleaner 1 according to an embodiment of the disclosure will be described in more detail.

[0139] Referring to FIG. 2, the cleaning unit 10 may include a cleaning housing 110, a cleaning connection pipe 120, and a rotary cleaning part 130.

[0140] The cleaning housing 110 has a suction port for sucking in air containing dirt. The air introduced through the suction port formed in the cleaning housing 110 by the suction force generated by the body unit 20 moves to the cleaning connection pipe 120.

[0141] The rotary cleaning part 130 is rotatably fastened to the cleaning housing 110. Also, the rotary cleaning part 130 may be provided to be rotated by a rotation motor (not illustrated) provided in the cleaning housing 110.

[0142] The rotary cleaning part 130 rotates by the driving force transmitted through the rotary motor and rubs against the floor surface to remove dirt. In addition, the outer circumferential surface of the rotary cleaning part 130 may be made of a fabric such as a fleece or a felt material. Accordingly, when the rotary cleaning part 130 rotates, foreign matters such as dust accumulated on the floor surface can be effectively removed by being caught in the outer circumferential surface of the rotary cleaning part 130.

[0143] The cleaning connection pipe 120 is provided in the cleaning housing 110 and may connect the cleaning housing 110 to the connection unit 40 or the body unit 20. That is, one side of the cleaning connection pipe 120 is connected to the cleaning housing 110 and the other side is connected to the connection unit 40 or the body unit 20.

[0144] In addition, a detachable button 141 for manipulating coupling with the connection unit 40 or the body unit 20 may be provided in the cleaning connection pipe 120. That is, the user may connect or disconnect the connection unit 40 or the body unit 20 to the cleaning connection pipe 120 by manipulating the detachable but-

ton 141.

[0145] Here, the cleaning connection pipe 120 and the detachable button 141 are constitutions corresponding to the coupling part of the cleaning unit 10 to be combined with other constitutions.

[0146] In addition, the cleaning connection pipe 120 may be rotatably connected to the cleaning housing 110 by a hinge. Through this, the cleaning connection pipe 120 may be rotated in the front and rear and left and right directions with respect to the cleaning housing 110.

[0147] Furthermore, a power protrusion 151 may be provided in the cleaning connection pipe 120. The power protrusion 151 is inserted into the power groove of the connection unit 40 or power groove 252 of the body unit 20, which is fastened to the cleaning connection pipe 120, and electrically connected thereto.

[0148] Through this, a power source may be supplied to the rotary motor provided to rotate the rotary cleaning part 130.

[0149] The first connection part 41 is formed in the form of a tube having a through center, and the air sucked through the cleaning unit 10 may flow through the through center.

[0150] The first connection part 41 may include a connection body 410, a first connection pipe 411, and a second connection pipe 412.

[0151] The first connection pipe 411 and the second connection pipe 412 are formed to extend from both ends of the connection body 410, respectively, and they are formed to be fastened and separated from other constitutions.

[0152] A detachable button 413 may be provided in the first connection pipe 411. That is, the user may connect or disconnect the second connection part 42, the body unit 20 or the handle unit 30 to the first connection pipe 411 by manipulating the detachable button 413.

[0153] The second connection pipe 412 is formed in a smaller size than the first connection pipe 411 and is inserted into a connection pipe formed in another constitution.

[0154] That is, the second connection pipe 412 may be inserted into and connected to the first connection pipe 421 of the second connection part 42, the cleaning connection pipe 120 of the cleaning unit 10, and the first connection pipe 213 of the body unit 20.

[0155] In addition, a locking protrusion 414 may be provided in the second connection pipe 412. That is, when the second connection pipe 412 is inserted into a connection pipe of another constitution, it is engaged with the detachable button provided in the connection pipe of the other constitution to combine both constitutions, and the user manipulates the detachable button to release from the locking protrusion 414, thereby separating the two constitutions.

[0156] For example, as illustrated in (a) in FIG. 3, when the first connection part 41 is connected to the cleaning unit 10, the second connection pipe 412 is inserted into the cleaning connection pipe 120. The locking protrusion

414 provided in the second connection pipe 412 is engaged with the detachable button 141 provided in the cleaning connection pipe 120 to connect the first connection part 41 to the cleaning unit 10.

[0157] In addition, when the first connection part 41 is separated from the cleaning unit 10, the user manipulates the detachable button 141 to separate the first connection part 41 from the locking protrusion 414, so that the first connection part 41 is disconnected and separated from the cleaning unit 10.

[0158] Here, the first and second connection pipes 411 and 421 of the first and second connection parts 41 and 42, the detachable buttons 413 and 423, and the locking protrusions 414 and 424 are the constitutions corresponding to the coupling part of the connection unit 40 to be combined with other constitutions.

[0159] The first connection part 41 may be provided with a power protrusion 415 and a power groove 416 for electrical connection between constitutions.

[0160] That is, the power protrusion 415 may be provided in the first connection pipe 411 of the first connection part 41, and the power supply groove 416 may be provided in the second connection pipe 412. Further, the power protrusion 415 and the power groove 416 are electrically connected to each other through a wire or the like.

[0161] With this constitution, when the first connection part 41 is disposed between other constitutions to connect the other constitutions, both a mechanical connection and an omniscient connection can be achieved.

[0162] For example, as illustrated in (a) in FIG. 3, when the second connection pipe 422 of the second connection part 42 is inserted into the first connection pipe 411 of the first connection part 41, the power protrusion 415 provided in the first connection pipe 411 of the first connection part 41 is inserted into the power groove 426 formed in the second connection pipe 422 of the second connection part 42 to be electrically connected.

[0163] Then, when the second connection pipe 412 of the first connection part 41 is inserted into the cleaning connection pipe 120 of the cleaning unit 10, the power protrusion 151 formed in the cleaning connection pipe 120 is inserted into the power groove 416 formed in the second connection pipe 412 of the first connection part 41 to be electrically connected.

[0164] With this constitution, the first connection part 41 mechanically and electrically connects the second connection part 42 and the cleaning unit 10.

[0165] The second connection part 42 is formed in the same shape as the first connection part 41, but may be shorter in length than the first connection part 41.

[0166] That is, as illustrated in FIGS. 3 and 4, the second connection part 42 is used together with the first connection part 41, but they are provided so that the center of gravity of the cleaner may be changed by changing the connection position.

[0167] Alternatively, as illustrated in FIGS. 5 and 6, the second connection part 42 is used separately from the first connection part 41, and the length of the cleaner may

be configured and used differently according to the user's selection.

[0168] The second connection part 42 is formed in a tube shape having a through center, so that the air sucked through the cleaning unit 10 may flow through the through center.

[0169] The second connection part 42 may include a connection body 420, a first connection pipe 421, and a second connection pipe 422.

[0170] The first connection pipe 421 and the second connection pipe 422 are formed to extend from both ends of the connection body 420, respectively, and are formed to be fastened and separated from other constitution.

[0171] In addition, in order for the second connection part 42 to form mechanical connection with other constitutions, a detachable button 423 may be provided in the first connection pipe 421 and a locking protrusion 424 may be provided in the second connection pipe 422.

[0172] In addition, in order for the second connection part 42 to form electrical connection with other constitutions, a power protrusion 425 may be provided on the first connection pipe 421, and a power groove 426 may be provided on the second connection pipe 422.

[0173] The handle unit 30 is provided so that the user can move and manipulate the cleaner by gripping the handle unit 30.

[0174] More specifically, the handle unit 30 may include a handle body 310, a handle connection pipe 320, and a grip part 330.

[0175] The handle connection pipe 320 is provided to extend from one end of the handle body 310 and is inserted into and fastened to a connection pipe of another constitution.

[0176] In addition, a locking protrusion 342 is provided in the handle connection pipe 320 to engage and release a detachable button provided in another constitution. The handle connection pipe 320 and the locking protrusion 342 are constitutions corresponding to the coupling part of the handle unit 30 to be combined with other constitutions.

[0177] In addition, the handle connection pipe 320 is provided with a power groove 352 to be coupled with and electrically connected to the power protrusions provided in other constitutions.

[0178] The grip part 330 extends from one end of the handle body 310 and is provided so that the user may grip it.

[0179] In addition, the grip part 330 may be provided with a control button part 361 through which the user can turn on or off the operation of the cleaner.

[0180] In addition, the grip part 330 may be provided with a display part 362 that provides information on the cleaner so that the user can grasp the operating state of the cleaner.

[0181] The body unit 20 provides a suction force so that external air is sucked through the cleaning unit 10, and separates and collects dust from the sucked air.

[0182] More specifically, referring to FIG. 9, the body

unit 20 may include a body housing 210, a driving part 220, and a dust collecting part 230.

[0183] The body housing 210 may include a first body housing 211, a second body housing 212, a first body connection pipe 213, and a second body connection pipe 214.

[0184] The first body housing 211 is positioned on the upper side of the second body housing 212, and the first body housing 211 and the second body housing 212 may be directly coupled or indirectly connected by an intermediary member.

[0185] The first body housing 211 and the second body housing 212 may be formed in a cylindrical shape, although not limited thereto.

[0186] The driving part 220 is provided in the first body housing 211, and the dust collecting part 230 is provided in the second body housing 212.

[0187] The first body housing 211 has an inflow passage through which air is introduced at the center of one side and an outflow passage through which air is discharged along the outer circumference of the other side.

[0188] The second body housing 212 has an inflow passage through which air is introduced at the center of one side and a discharge passage through which air is discharged at the center of the other side.

[0189] The first body connection pipe 213 is formed in a closed area where no discharge passage is formed on the other side of the first body housing 211. That is, one side of the first body connection pipe 213 is closed so that air does not flow.

[0190] In addition, a detachable button 241 coupled to a locking protrusion provided in another constitution may be provided in the first body connection pipe 213 for mechanical connection with the other constitution.

[0191] In addition, a power protrusion 251 coupled to a power groove provided in another constitution may be provided in the first body connection pipe 213 for electrical connection with the other constitution.

[0192] The second body connection pipe 214 is formed to protrude outward from a portion where the inflow passage is formed on one side of the second body housing 212, and communicates with the inside of the second body housing 212.

[0193] That is, the second body connection pipe 214 is directly or indirectly connected to the cleaning unit 10, and is penetrated so that the suction force generated by the driving part 220 is provided to the cleaning unit 10.

[0194] In addition, a locking protrusion 242 is provided in the second body connection pipe 214 to engage and release a detachable button provided in another constitution for mechanical connection with the other constitution.

[0195] Here, the first and second body connection pipes 213 and 214, the detachable button 241 and the locking protrusion 242 are constitutions corresponding to the coupling part of the body unit 20 to be combined with other constitution.

[0196] In addition, the second body connection pipe

214 is provided with a power groove 252 coupled with a power protrusion provided in another constitution for electrical connection with the other constitution.

[0197] The driving part 220 is provided in the first body housing 211 and provides a suction force so that external air is sucked in.

[0198] More specifically, the driving part 220 may be provided with a motor 221 that provides a rotational force and an impeller 223 that is fastened to the shaft 222 of the motor 221 and rotates together with the shaft 222 to provide a suction force.

[0199] That is, when the motor 221 is driven and the impeller 223 rotates, air is forcibly flowed to provide a suction force so that the air is introduced into the second body connection pipe 214.

[0200] The dust collecting part 230 is provided in the second body housing 212 and separates and collects dust from the air sucked in by the suction force of the driving part 220.

[0201] More specifically, the dust collecting part 230 may include a first cyclone part 231 and a second cyclone part 232.

[0202] That is, the dust collecting part 230 may separate dust by a cyclone flow.

[0203] The air and dust sucked in through the second body connection pipe 214 spirally flow along the inner circumferential surface of the first cyclone part 231.

[0204] An axis of cyclone flow of the first cyclone part 231 may extend in a vertical direction.

[0205] The air flowing as a cyclone in the first cyclone part 231 is discharged to the second cyclone part 232 after primarily separating dust while passing through a fine filter.

[0206] The second cyclone part 232 separates dust from the air discharged from the first cyclone part 231 again. Here, the second cyclone part 232 may be positioned inside the first cyclone part 231 so that the size of the dust collecting part 230 is minimized.

[0207] Here, the second cyclone part 232 may include a plurality of cyclone bodies arranged in parallel.

[0208] As another example, the dust collecting part 230 may have a single cyclone part, and may be in any form capable of separating dust from sucked air other than the cyclone.

[0209] The second body housing 212 serves as a dust container for storing dust separated from the respective cyclone parts 231 and 232.

[0210] For example, the first body housing 211 and the second body housing 212 are combined and separated, and when dust is collected in the second body housing 212, the second body housing 212 may be removed to discard the stored dust. Here, the second cyclone part 232 may also be separated.

[0211] The dust collecting part 230 may further include a guide part 233. The guide part 233 is formed to protrude from the inside of the second body housing 212 by extending with the second body connection pipe 214 from one side of the second body housing 212.

[0212] The guide part 233 guides the air introduced through the second body connection pipe 214 to the second body housing 212, and serves as a barrier to prevent dust separated by the first cyclone part 231 from being discharged to the second body connection pipe 214.

[0213] Furthermore, the body unit 20 may further include a pre-filter 261 and a HEPA filter 262.

[0214] The pre-filter 261 is disposed to filter dust from air before the air passing through the second cyclone part 232 is introduced into the motor 221.

[0215] To this end, the pre-filter 261 is disposed to surround the motor 221 within the first body housing 211, and filters dust from the air introduced into the motor 221.

[0216] Also, the HEPA filter 262 is disposed to additionally filter dust from the air before the air passing through the motor 221 is discharged to the outside.

[0217] To this end, the HEPA filter 262 is disposed along the outer circumference formed with the discharge passage through which air is discharged from the other side of the first body housing 211.

[0218] With this constitution, the body unit 20 is constituted to first filter dust from the air sucked into the second body connection pipe 214 at the first cyclone part 231, and then secondarily filter the dust introduced in the second cyclone part 232, thirdly filter the dust by the pre-filter 261 and introduce the dust into the motor 221, finally filter the dust in the HEPA filter 262, and then discharge the air to the outside.

[0219] FIGS. 10 and 11 are views schematically illustrating a position where the battery unit is fastened in a modular cleaner according to another embodiment of the disclosure, and FIG. 12 is a perspective view schematically illustrating a constitution for fastening the battery unit, which is taken out.

[0220] Referring to FIGS. 10 to 12, in a modular cleaner according to another embodiment of the disclosure, the battery unit 50 may be used by fastening to any one or more or all of the cleaning unit 10, the body unit 20, the handle unit 30, and the connection unit 40.

[0221] Since the battery unit 50 has a heavy constitution, the user can directly select the fastening position of the battery unit 50 to change or distribute the center of gravity so that a connection structure that the user can feel convenient can be used.

[0222] For example, one battery unit 50 may be provided, and the battery unit 50 may be used by being fastened to one of the cleaning unit 10, the body unit 20, the handle unit 30, and the connection unit 40. That is, the user can directly select the fastening position of the battery unit 50 to change the fastening position.

[0223] Alternatively, a plurality of battery units 50 may be provided, and the plurality of battery units 50 may be used by being fastened to two or more of the cleaning unit 10, the body unit 20, the handle unit 30, and the connection unit 40. That is, when the plurality of battery units 50 is fastened, the capacity of the battery increases, so that the use time of the cleaner may be secured.

[0224] As illustrated in FIG. 10, one battery unit 50 may

be provided to be fastened to each of the cleaning unit 10, the body unit 20, the handle unit 30, and the connection unit 40, respectively.

[0225] That is, the cleaning unit 10 may be constituted such that a battery coupling groove 180 is provided in the cleaning housing 110 so that the battery unit 50 is coupled and separated.

[0226] The body unit 20 may be constituted such that a battery fastening groove 280 is provided in the body housing 210 so that the battery unit 50 is coupled and separated.

[0227] The handle unit 30 may be constituted such that a battery fastening groove 380 is provided in the grip part 330 so that the battery unit 50 is coupled and separated. Also, the battery fastening groove 380 provided in the handle unit 30 may be provided in the handle main body 310 or the handle connection pipe 320.

[0228] The first connection part 41 may be constituted such that a battery fastening groove 418 is provided in the first connection pipe 411 so that the battery unit 50 is coupled and separated.

[0229] The second connection part 42 may be constituted such that a battery fastening groove 428 is provided in the first connection pipe 421 so that the battery unit 50 is coupled and separated.

[0230] The battery fastening groove provided in each constitution may be formed so that the battery unit 50 may be fastened in a direction corresponding to a direction in which the cleaning unit 10 performs cleaning in a straight line without being rotated.

[0231] For example, the battery fastening groove may be provided to be fastened to each constitution so that the battery unit 50 is positioned on the rear surface of the cleaner in each constitution.

[0232] That is, when the battery unit 50 is fastened to be positioned on the side of the cleaner in each constitution, a rotational moment load is applied to the cleaner due to the weight of the battery unit 50, which acts as a load burden on the user. Accordingly, the battery unit 50 may be fastened to each constitution so as to be positioned on the rear surface of the cleaner.

[0233] Alternatively, as illustrated in FIG. 11, two battery units 50 may be provided so that two battery units 50 are fastened to each of the cleaning unit 10, the body unit 20, the handle unit 30, and the connection unit 40.

[0234] In this case, the battery coupling groove may be provided to be fastened to each constitution so that the two battery units 50 are positioned on both sides of the cleaner in each constitution.

[0235] That is, when the battery unit 50 is fastened to be positioned on the side of the cleaner in each constitution, it is possible to prevent a rotational moment load from being applied to the cleaner and it is possible to increase the capacity of the battery.

[0236] To this end, the battery unit 50 may include a battery body 510, a fastening protrusion 520, and a contact terminal 530.

[0237] The battery body 510 may be constituted as a

housing having a battery therein.

[0238] The fastening protrusion 520 is provided on the battery body 510 and is formed to be fastened to the battery fastening groove formed in each constitution.

[0239] In addition, the contact terminal 530 is electrically connected to the battery provided inside the battery body 510 and is formed to be exposed to the outside from the fastening protrusion 520.

[0240] When the fastening protrusion 520 is inserted into the battery fastening groove formed in each constitution, the contact terminal 530 contacts and is electrically connected to the contact terminal 283 formed in the battery fastening groove.

[0241] For example, the fastening protrusion 520 may be formed with a first protrusion 521 protruding outward from one surface of the battery body 510 and a second protrusion 522 extending outward from an end of the first protrusion 521. That is, the fastening protrusion 520 may be formed in a T shape.

[0242] As an example of the battery fastening groove, the battery fastening groove 280 formed in the body unit 20 will be described. The shape of the battery fastening groove 280 formed in the body unit 20 is the same as that of each of the battery fastening groove 180, 380, 418, 428 each formed in the cleaning unit 10, the handle unit 30, the first connection part 41 and the second connection part 42.

[0243] In this case, the battery fastening groove 280 may be formed with a first slit 281 to which the first protrusion 521 of the fastening protrusion 520 is inserted and a second slit 282 to which the second protrusion 522 is inserted.

[0244] In this form, when the T-shaped fastening protrusion 520 is inserted into the battery fastening groove 280, the second protrusion 522 is positioned below the first slit 281 and is fitted and fastened. Through this, the battery unit 50 may be fitted and fastened to the battery fastening groove 280.

[0245] In addition, since the contact terminal 283 is formed on the inner surface of the battery fastening groove 280, when the fastening protrusion 520 is inserted, it comes into contact with the contact terminal 530 formed on the fastening protrusion 520 to be omnisciently connected.

[0246] Furthermore, in the battery fastening groove 280, the first slit 281 may be formed only in one area.

[0247] When formed in this way, the fastening protrusion 520 is inserted into the second slit 282 in a vertical direction in an area where the first slit 281 is not formed in the battery fastening groove 280, and then the fastening protrusion 520 may be moved to the first slit 281 side to be fastened.

[0248] With this constitution, an operation area for fastening the battery unit 50 to the battery fastening groove 280 may be minimized.

[0249] The shapes of the fastening protrusion 520 and the battery fastening groove, which are constitutions for fastening the battery unit 50 to each constitution, are not

limited thereto, and may be formed in any shape capable of fastening and separating the battery unit 50.

[0250] FIG. 13 is a perspective view schematically illustrating a state of use of a modular cleaner according to another embodiment of the disclosure, and FIG. 14 is a cross-sectional view schematically illustrating a handle unit of the modular cleaner.

[0251] Referring to FIGS. 13 and 14, a modular cleaner according to another embodiment of the disclosure may be used for both wired and wireless purposes.

[0252] That is, the modular cleaner according to another embodiment of the disclosure may be used as a wireless cleaner when the body unit 20 described above is connected.

[0253] Alternatively, the modular cleaner may be used as a wired cleaner by connecting to a separate cleaner body 60 without connecting to the body unit 20 described above.

[0254] That is, referring to FIG. 13, the cleaner body 60 is a general canister that receives power wired through a wired cable (not illustrated). A drive motor (not illustrated) is provided inside the cleaner body 60 to provide a suction force.

[0255] Also, a modular cleaner according to another embodiment of the disclosure is connected to the cleaner body 60 through a connection hose 61.

[0256] Here, in the modular cleaner, the cleaning unit 10, the first connection part 41, the second connection part 42, and the handle unit 30 may be connected. Also, the cleaning unit 10, the first connection part 41, and the second connection part 42 may be selectively connected according to the physical condition of the user or the cleaning environment.

[0257] In addition, the handle unit 30 may be fastened to the connection hose 61 so that the air is sucked by the cleaning unit 10 with a suction force generated by the cleaner body 60.

[0258] For example, referring to FIG. 14, the handle unit 30 may include a handle body 310, a handle connection pipe 320, and a grip part 330.

[0259] Here, a locking protrusion 342 and a power groove 352 may be formed in the handle connection pipe 320.

[0260] In addition, an air flow part 370 may be formed in the handle body 310 to communicate with the handle connection pipe 320 so that air flows therethrough and to insert the connection hose 61 therein.

[0261] That is, the air flow part 370 is penetrated to have a hollow, and when the connection hose 61 is inserted, the connection hose 61 and the handle connection pipe 320 are provided to be connected.

[0262] Through this, when a suction force is generated in the cleaner body 60, the air sucked through the cleaning unit 10 is introduced into the cleaner body 60 through the connection hose 61 connected to the handle unit 30.

[0263] The handle unit 30 may be provided with an opening and closing door 372 for opening and closing the air flow part 370. That is, the opening and closing

door 372 is constituted to close the air flow part 370 when the connection hose 61 is not inserted into the handle unit 30, and the opening and closing door 372 is constituted to rotate inward to open the air flow part 370 when the connection hose 61 is inserted.

[0264] Although not illustrated in the drawing, a spring for applying an elastic force so that the opening and closing door 372 rotates in a direction to close the air flow part 370 may be provided.

[0265] Also, the handle unit 30 may be further provided with a fastening button 371 to fasten and fix the inserted connection hose 61. A fastening groove 61a may be formed in the connection hose 61 so that the fastening button 371 is inserted.

[0266] Here, the fastening button 371 is rotatably fastened to the handle unit 30, and is return to an original position in response to the application of an elastic force by a spring (not illustrated).

[0267] That is, when inserting the connection hose 61 into the handle unit 30, the user presses the fastening button 371 to rotate it clockwise so that the connection hose 61 is inserted into an air flow part 370 and then releases the fastening button 371, which is return to an original position, and then inserted into the fastening groove 61a formed in the connection hose 61 to fasten and fix the connection hose 61.

[0268] Although the disclosure has been described in detail through specific examples, it is intended to describe the disclosure in detail, and the disclosure is not limited thereto, and it is clear that the disclosure can be modified or improved by those skilled in the art within the technical spirit of the disclosure.

[0269] All simple modifications or changes of the disclosure fall within the scope of the disclosure, and the specific protection scope of the disclosure will become apparent from the appended claims.

Claims

1. A modular cleaner, comprising:

- a body unit that includes a motor and an impeller therein to generate a suction force, and a dust collecting part to store dirt;
 - a battery unit that is provided on the body unit and applies a power source to the motor and impeller;
 - a handle unit that is detachable from the body unit and includes a grip part capable of being gripped by a user; and
 - a cleaning unit that comes into contact with an object to be cleaned to apply a physical force to the object to be cleaned,
- wherein coupling parts for coupling with the handle unit or cleaning unit are provided on both ends of the body unit,
- when the coupling part of the body unit is cou-

- pled to the handle unit or the cleaning unit, at least one of the body unit and the handle unit or the body unit and the cleaning unit is electrically connected to each other.
2. The modular cleaner of claim 1, comprising a connection unit that is disposed on at least one of a position between the cleaning unit and the body unit and a position between the body unit and the handle unit to connect the body unit to the cleaning unit or the body unit to the handle unit, wherein the connection unit includes:
- a hollow for fluid to move therein; and
a coupling part for coupling with at least one of the cleaning unit, the body unit, and the handle unit,
when the coupling part of the connection unit is coupled to the cleaning unit or the handle unit, the cleaning unit or the handle unit is electrically connected to the body unit through the coupling part of the connection unit.
3. The modular cleaner of claim 2, wherein the connection unit is provided in plurality and the plurality of connection units has different lengths.
4. The modular cleaner of claim 1, wherein a weight of the body unit is heavier than the cleaning unit and the handle unit.
5. The modular cleaner of claim 1, wherein the cleaning unit is provided with a suction port through which external air is sucked.
6. The modular cleaner of claim 1, wherein the battery unit is detachably provided in the body unit.
7. The modular cleaner of claim 2, wherein the connection unit includes:
- a first connection part; and
a second connection part formed to be shorter in length than the first connection part.
8. The modular cleaner of claim 7, wherein each of the first connection part and the second connection part connects between the body unit and the cleaning unit or between the body unit and the handle unit.
9. The modular cleaner of claim 7, wherein a connection is formed between the body unit and the cleaning unit or between the body unit and the handle unit in a state in which the first connection part and the second connection part are coupled to each other.
10. The modular cleaner of claim 7, wherein in a state where the first connection part and the second connection part are separated from each other, the first connection part and the second connection part are disposed at different positions among between the body unit and the cleaning unit and between the body unit and the handle unit to connect respective constitutions.
11. The modular cleaner of claim 7, wherein only one of the first connection part and the second connection part connects between the body unit and the cleaning unit or between the body unit and the handle unit.
12. The modular cleaner of claim 1, wherein the cleaning unit is detachably provided with a cleaning mop capable of wiping a floor surface.
13. The modular cleaner of claim 1, wherein the battery unit is provided with at least one, and the at least one battery unit is fastened to at least one of the body unit, the cleaning unit, the handle unit, and the connection unit.
14. The modular cleaner of claim 13, wherein the battery unit is fastened to be positioned on a rear surface of each constitution facing a floor surface in a state in which the cleaning unit is disposed in a straight line without being rotated.
15. The modular cleaner of claim 13, wherein the battery unit is fastened to be positioned on both sides of each constitution.
16. The modular cleaner of claim 1, comprising:
- a cleaner body that receives the power source through a wire and provides the suction force; and
a connection hose provided in the cleaner body, wherein the handle unit is connected to the body unit so that the cleaner is used as a handy type cleaner, or the handle unit is connected to the connection hose so that the cleaner is used as a canister type cleaner.
17. The modular cleaner of claim 16, wherein the handle unit includes:
- a handle body in which an air flow part is formed into which the connection hose is inserted;
a handle connection pipe provided on one side of the handle body and connected to another constitution to allow air to flow to the air flow part; and
a grip part provided on the other side of the handle body and gripped by the user.
18. The modular cleaner of claim 17, wherein the handle unit opens and closes the air flow part, and rotates

inward when the connection hose is inserted to open the air flow part.

19. The modular cleaner of claim 18, wherein the handle unit includes a fastening button inserted into a fastening groove formed in the connection hose to fasten and fix the connection hose when the connection hose is inserted.

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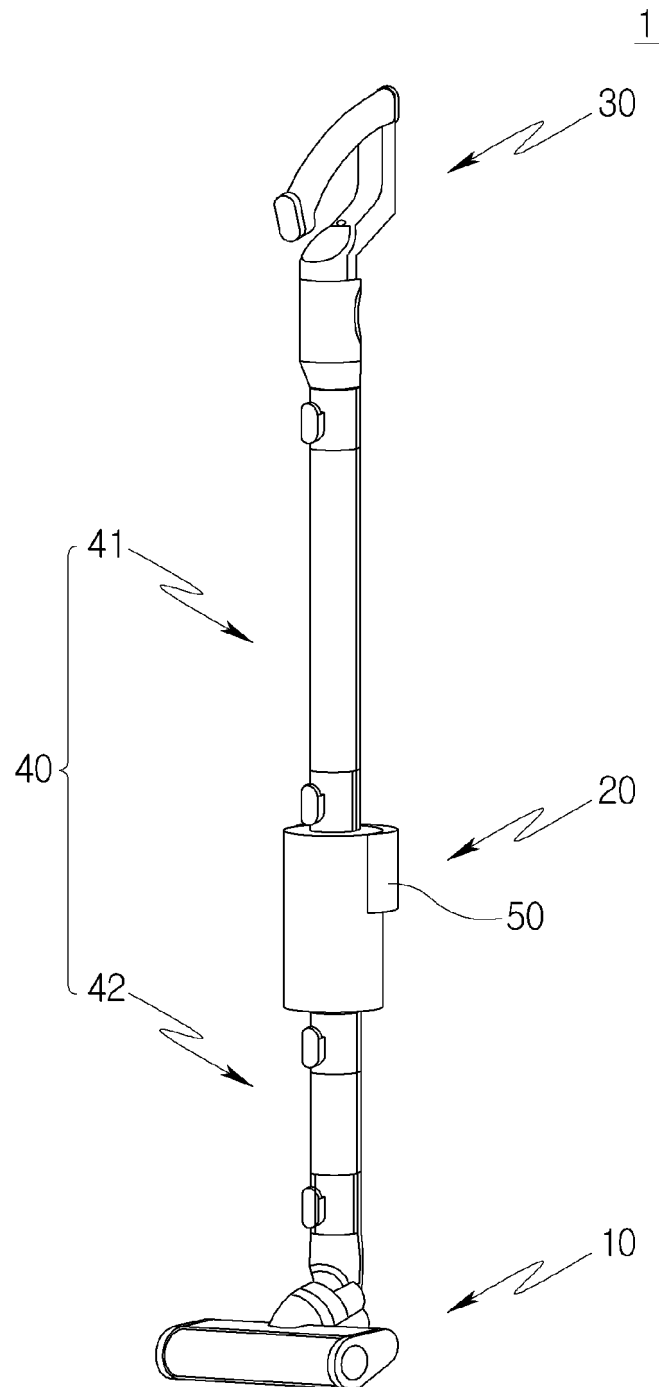
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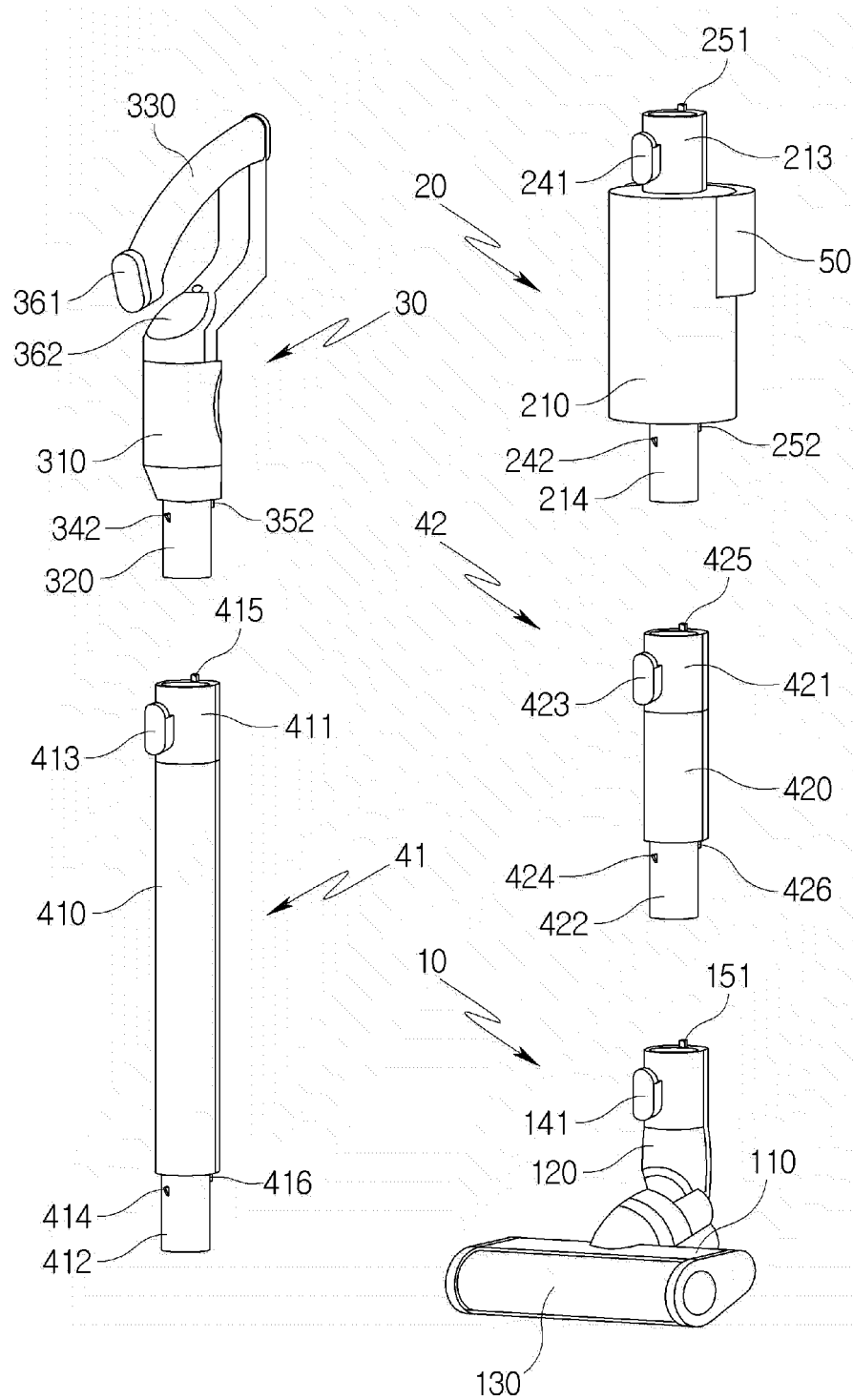
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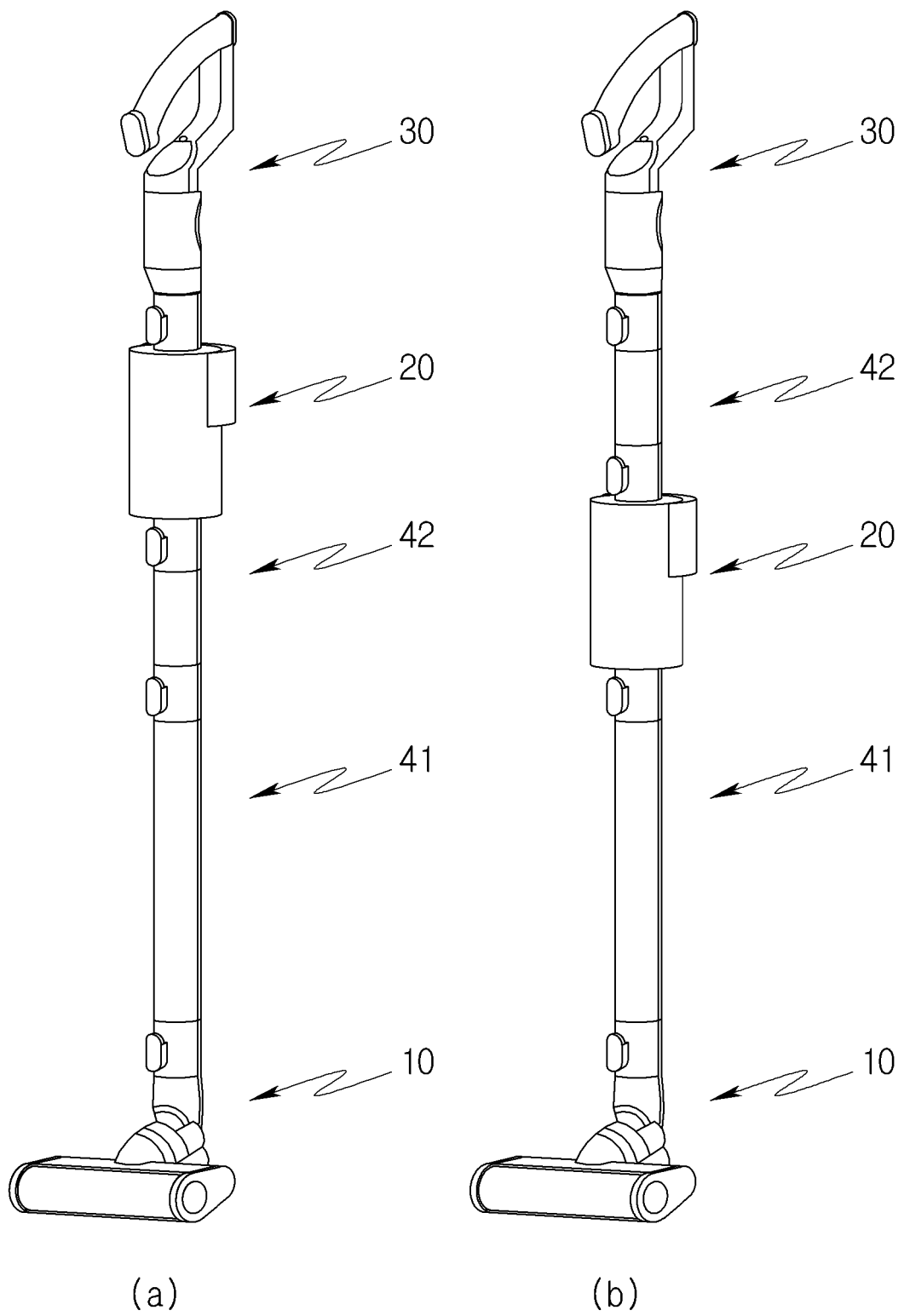
[FIG. 1]



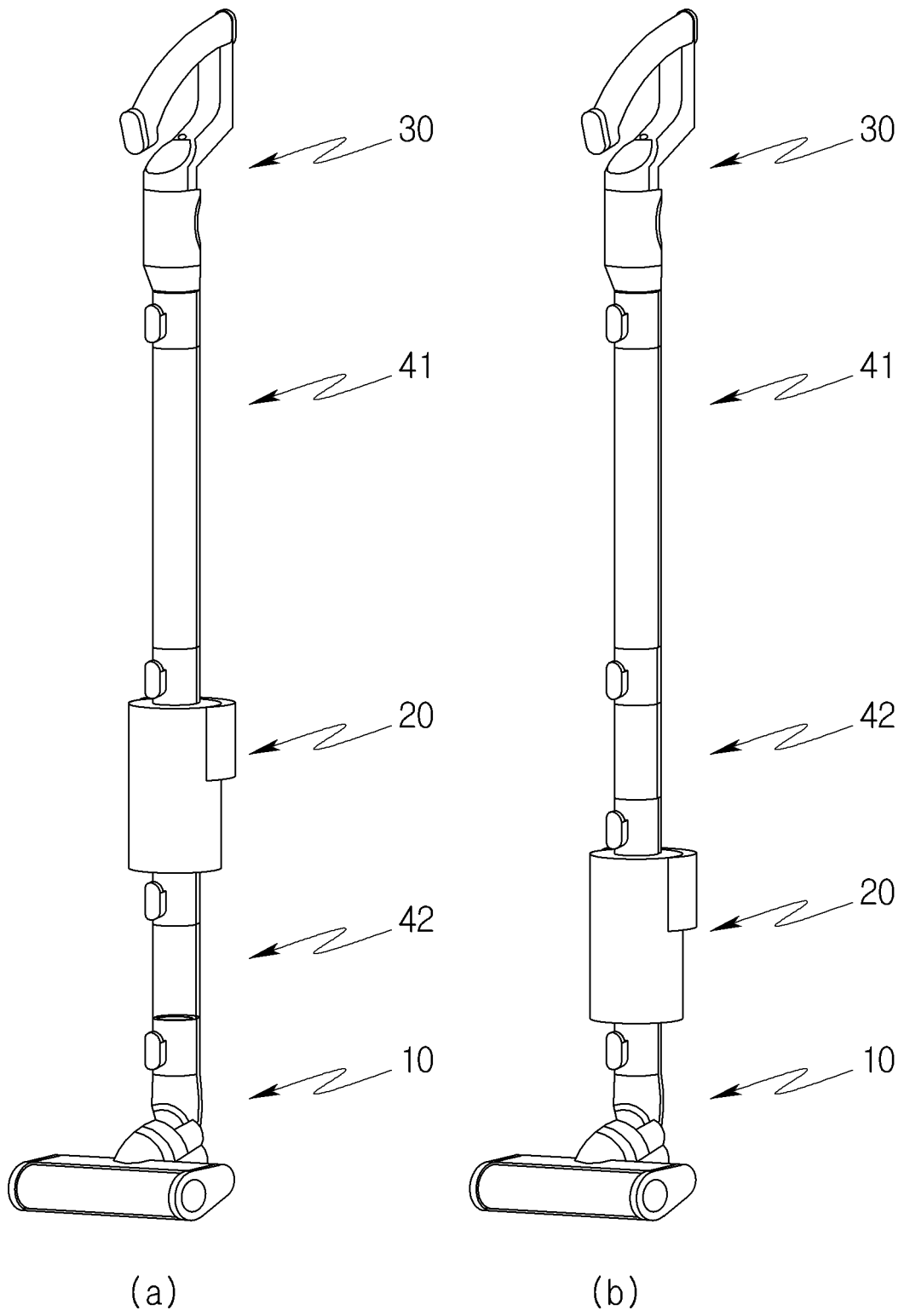
[FIG. 2]



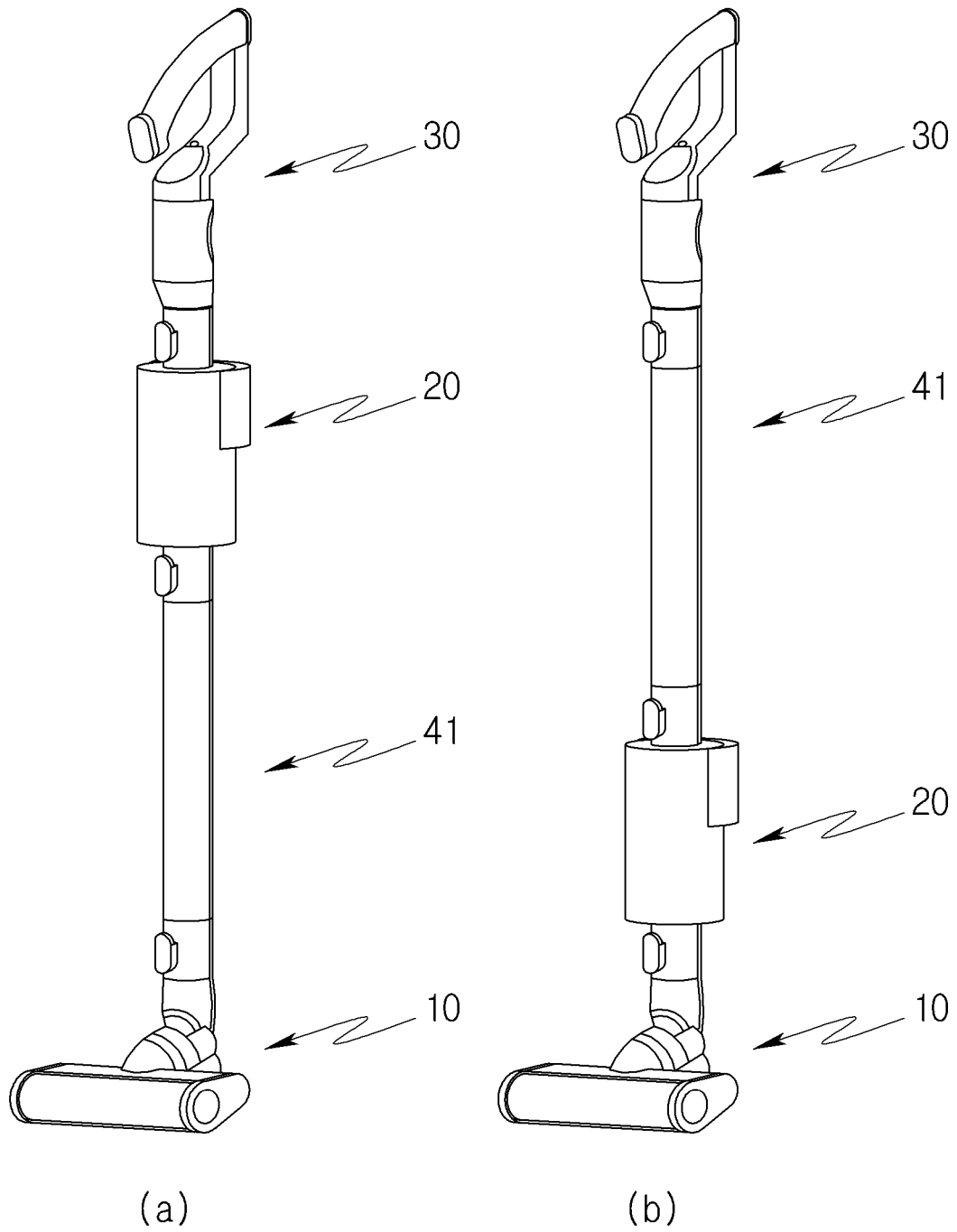
[FIG. 3]



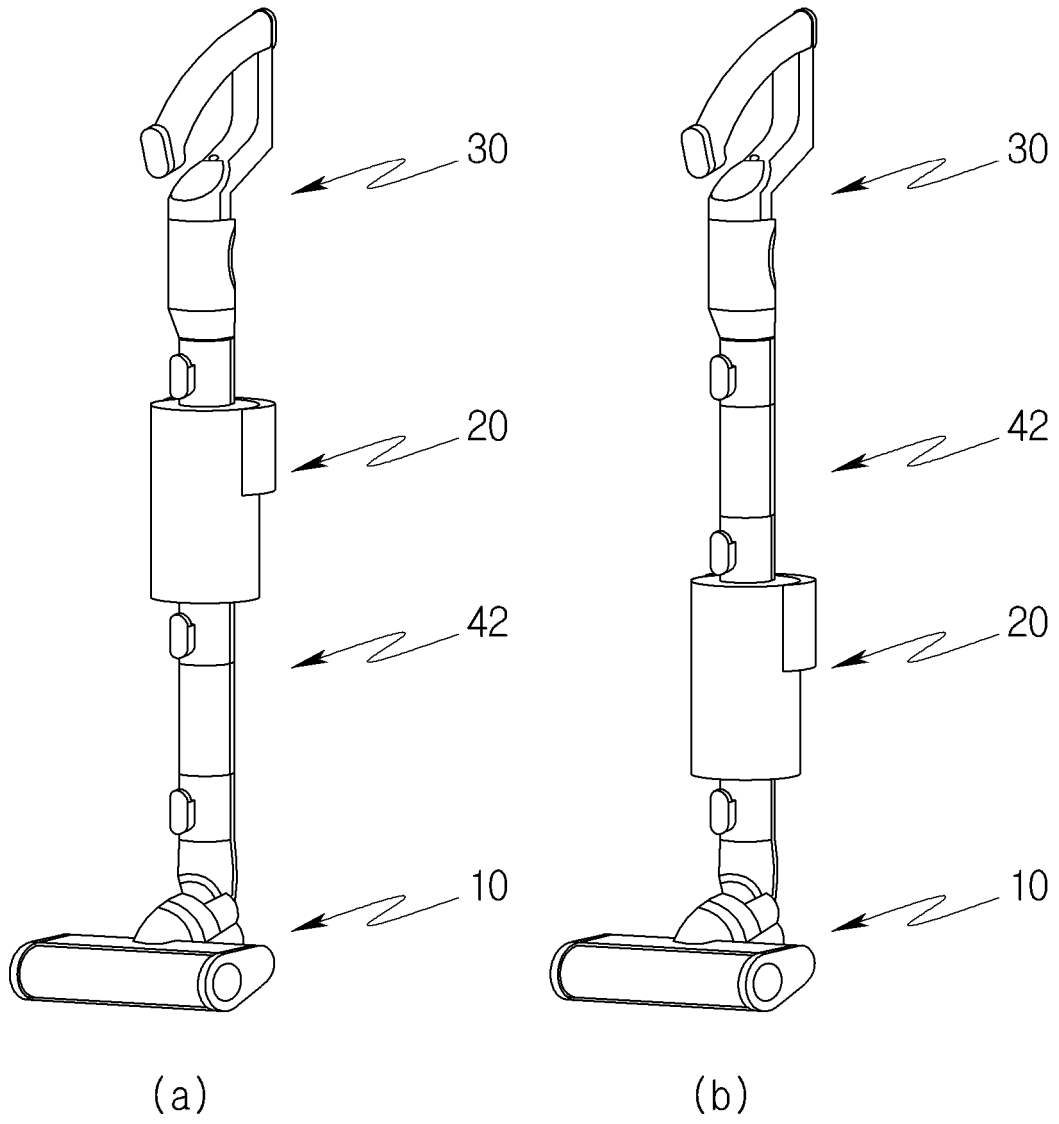
[FIG. 4]



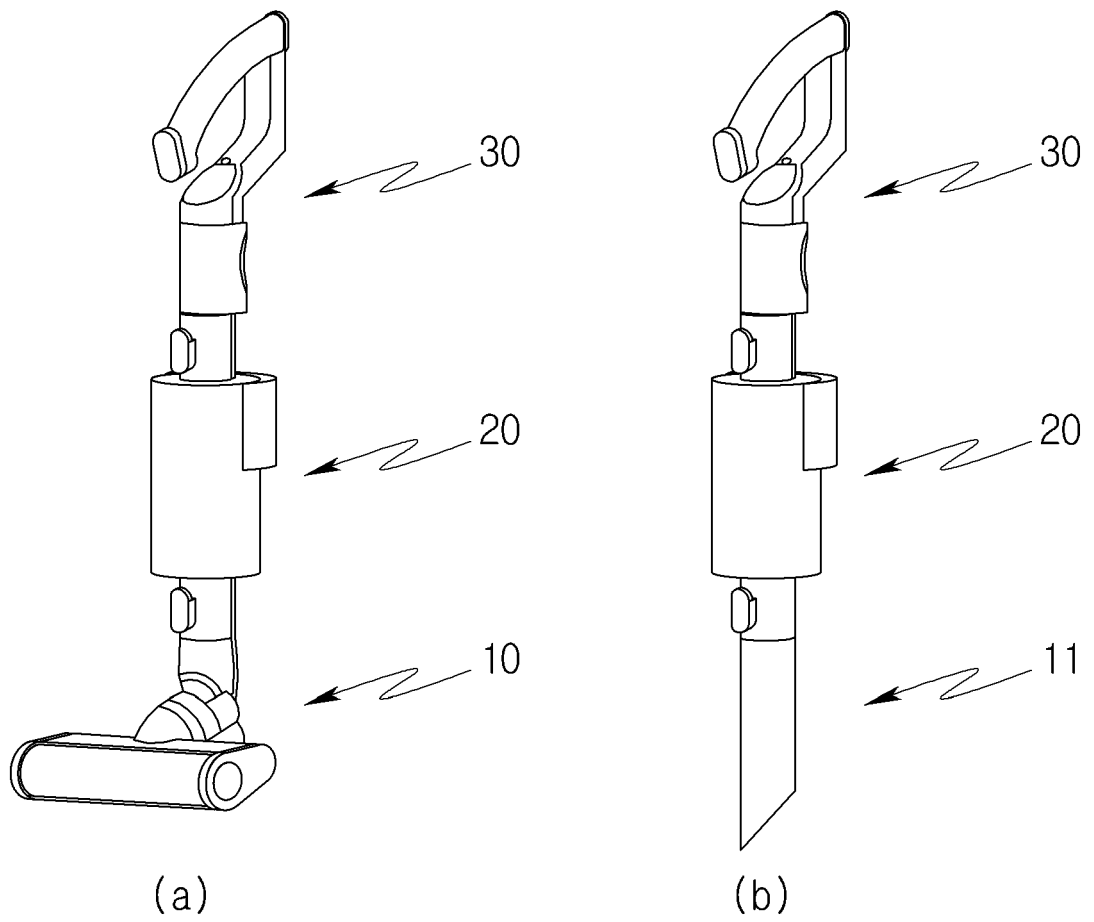
[FIG. 5]



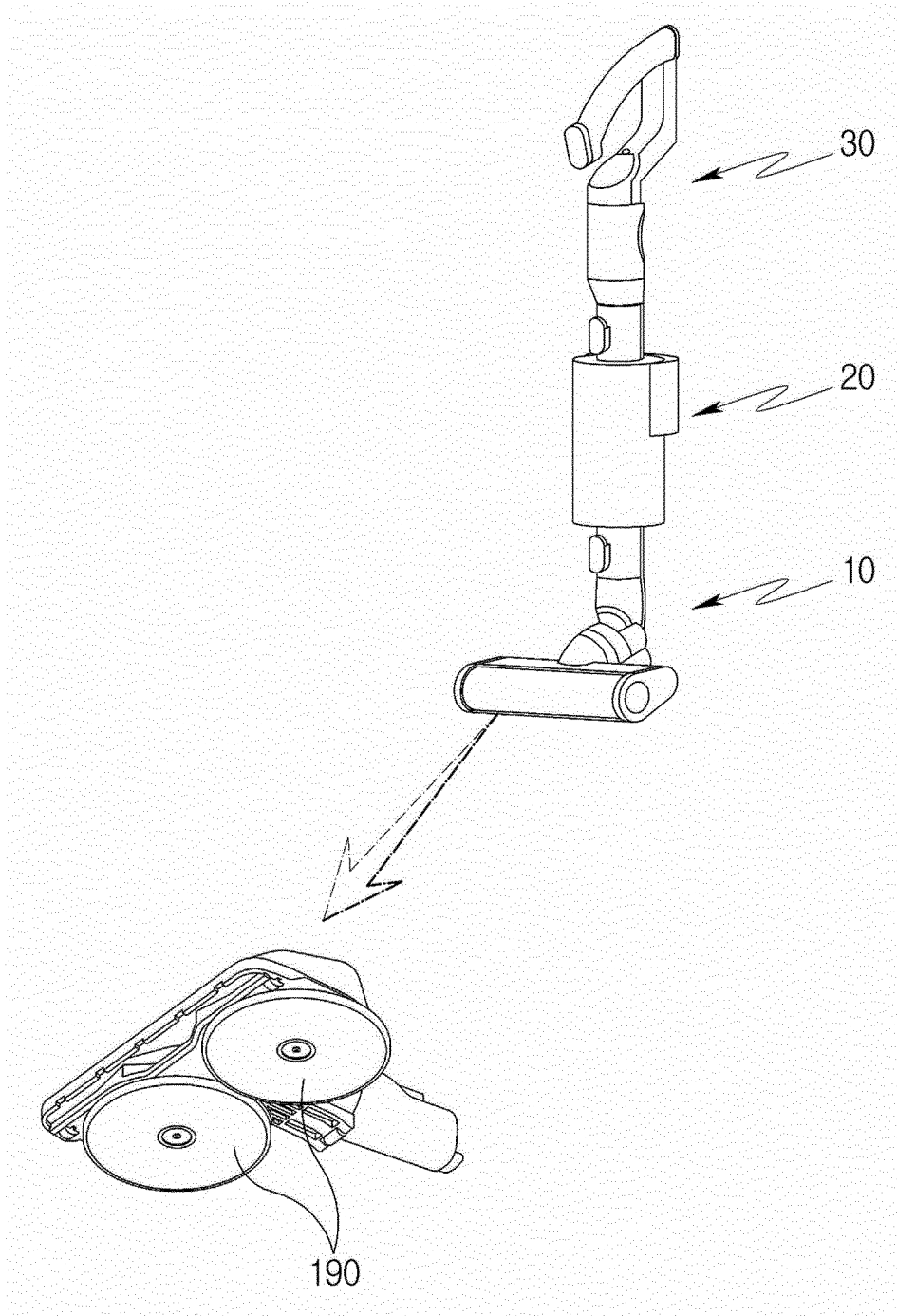
[FIG. 6]



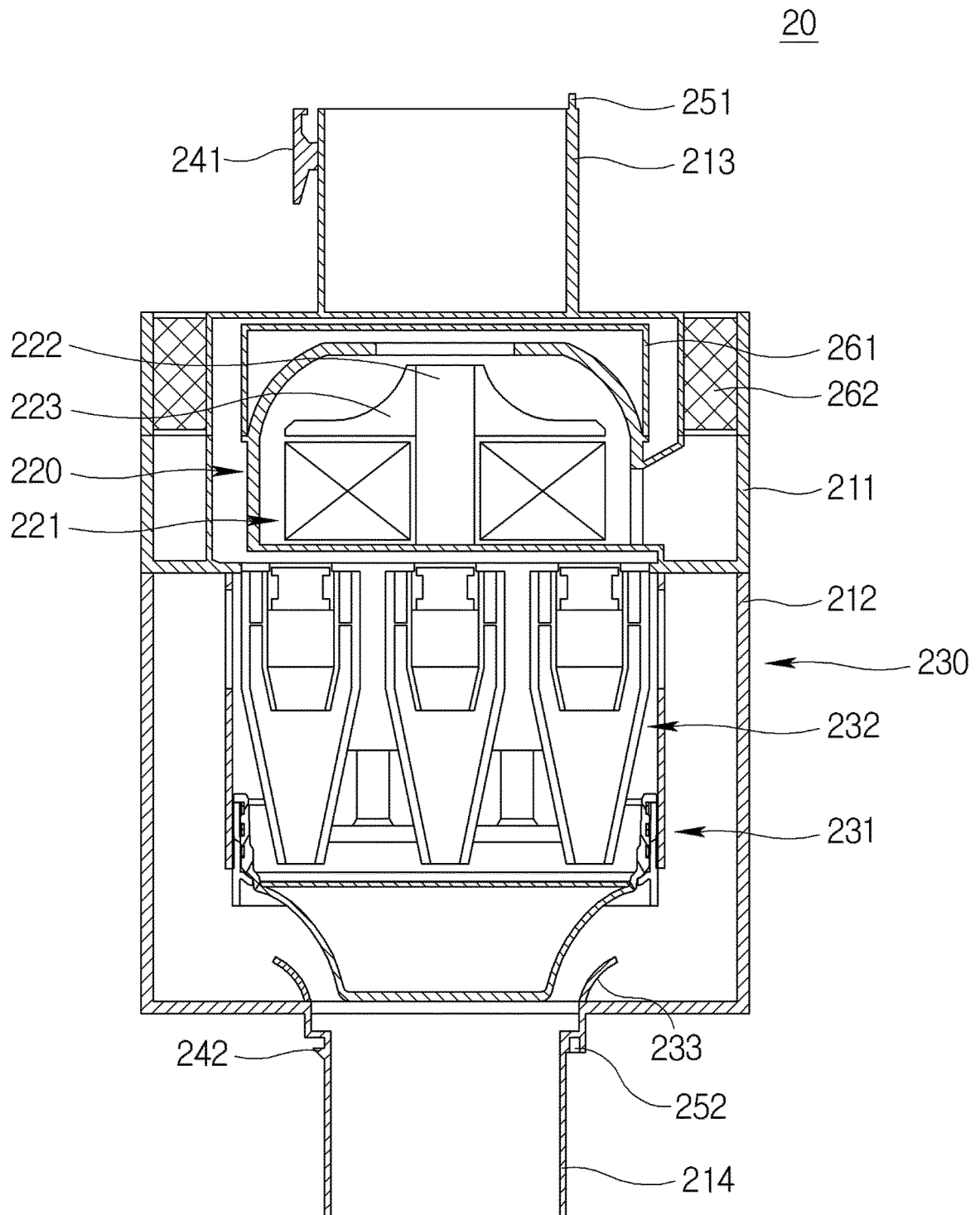
[FIG. 7]



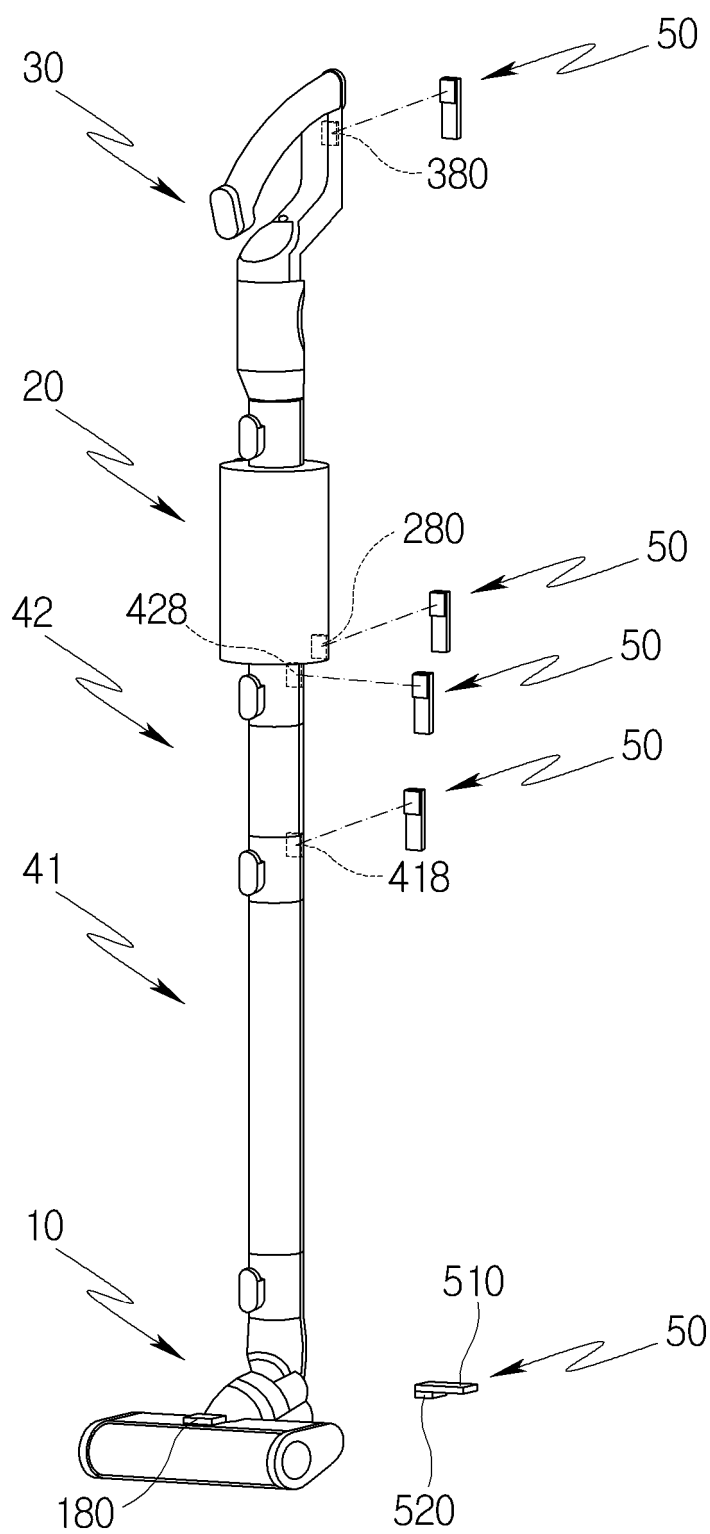
[FIG. 8]



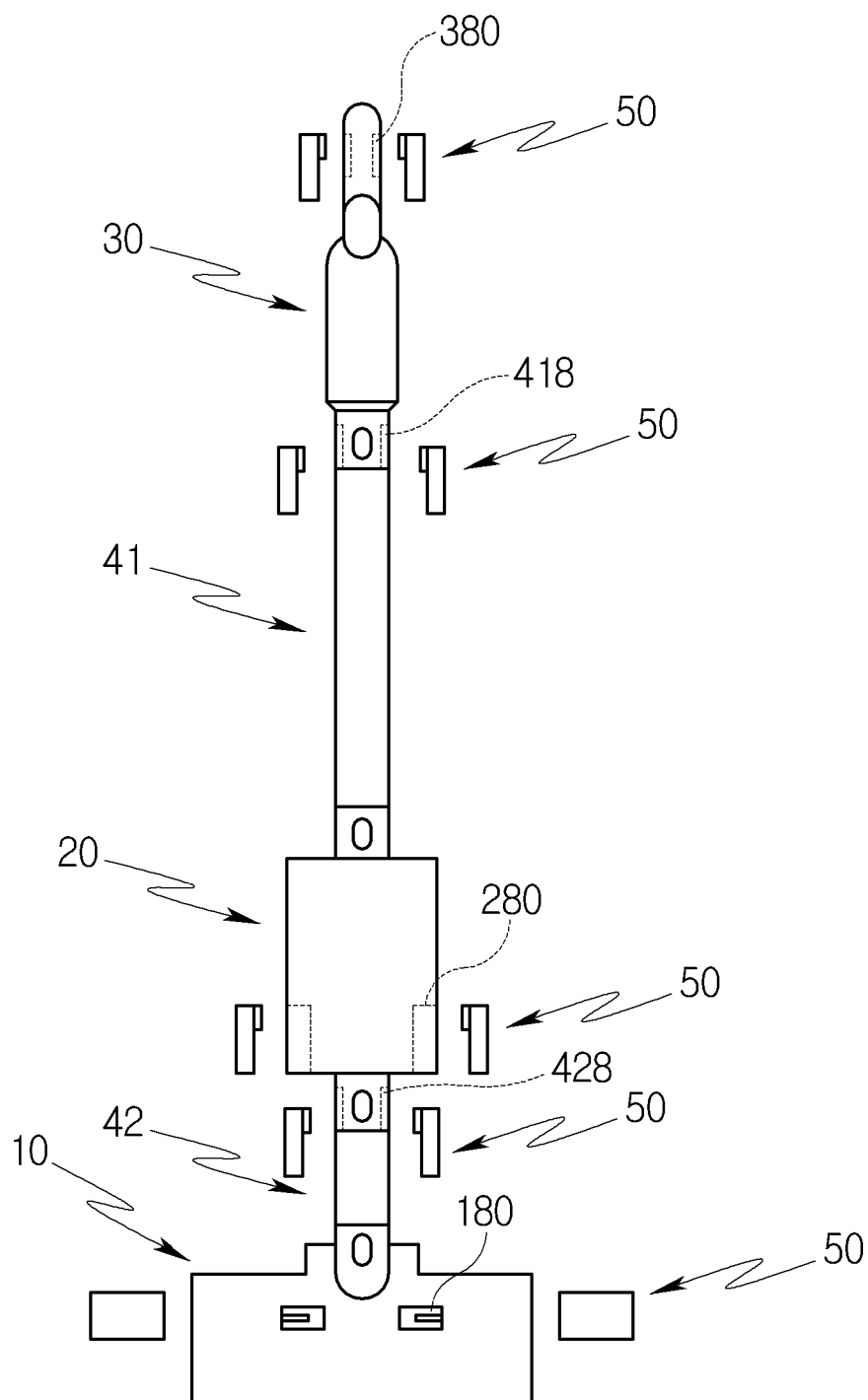
[FIG. 9]



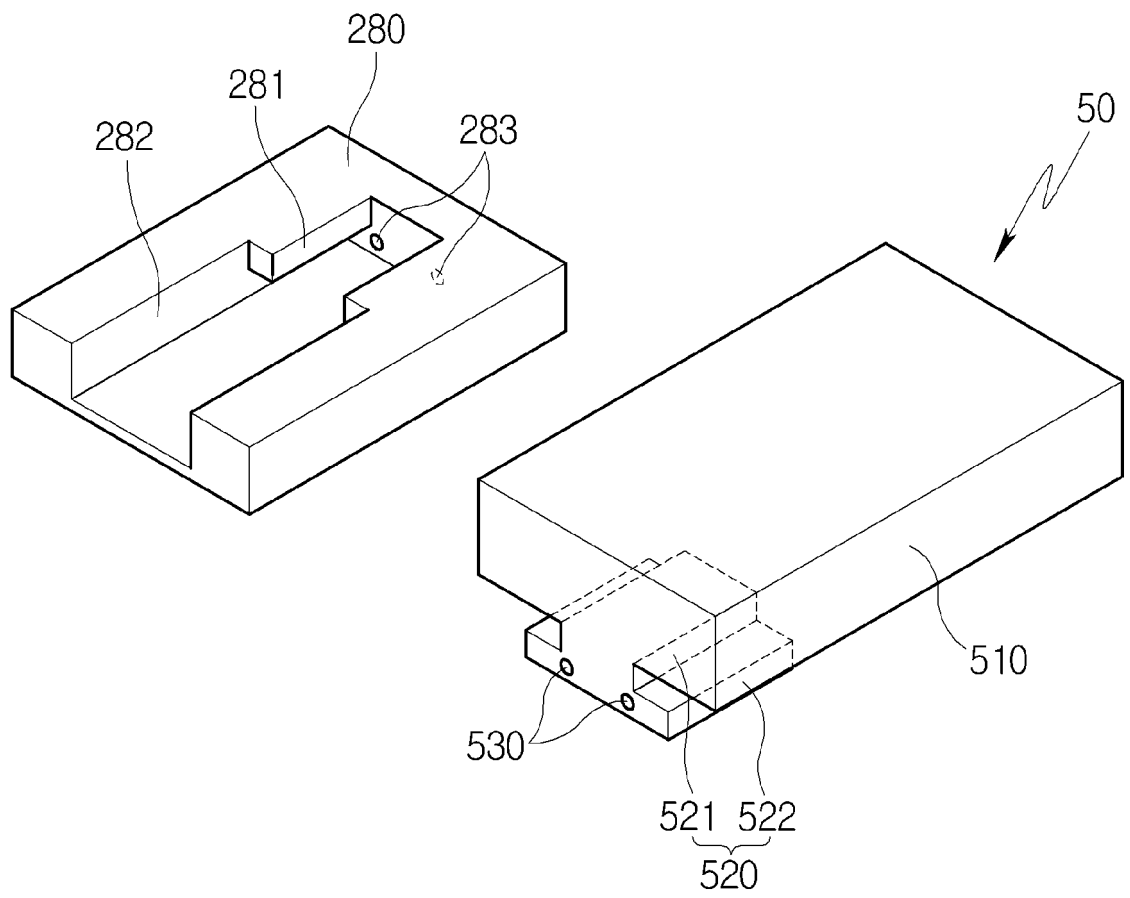
[FIG. 10]



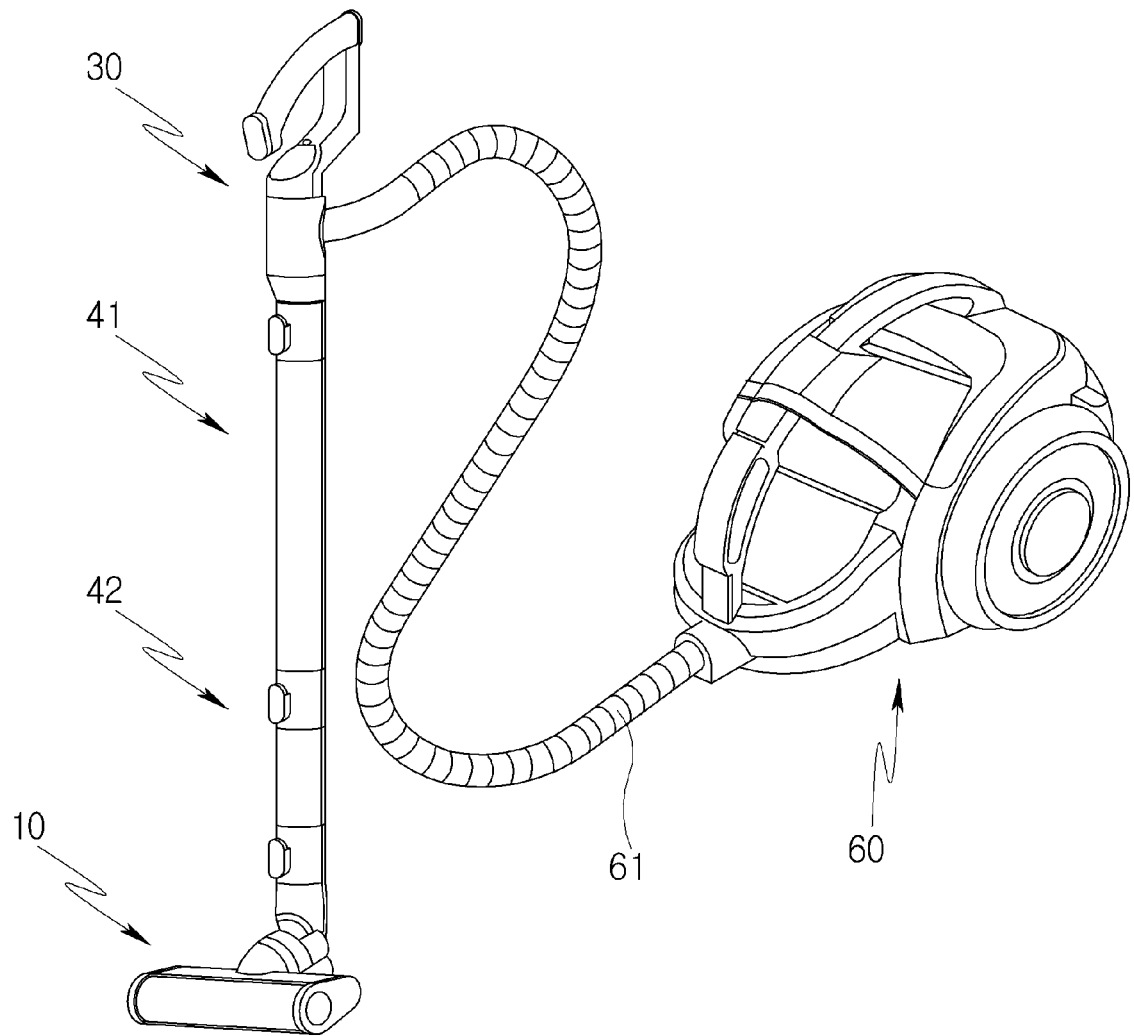
[FIG. 11]



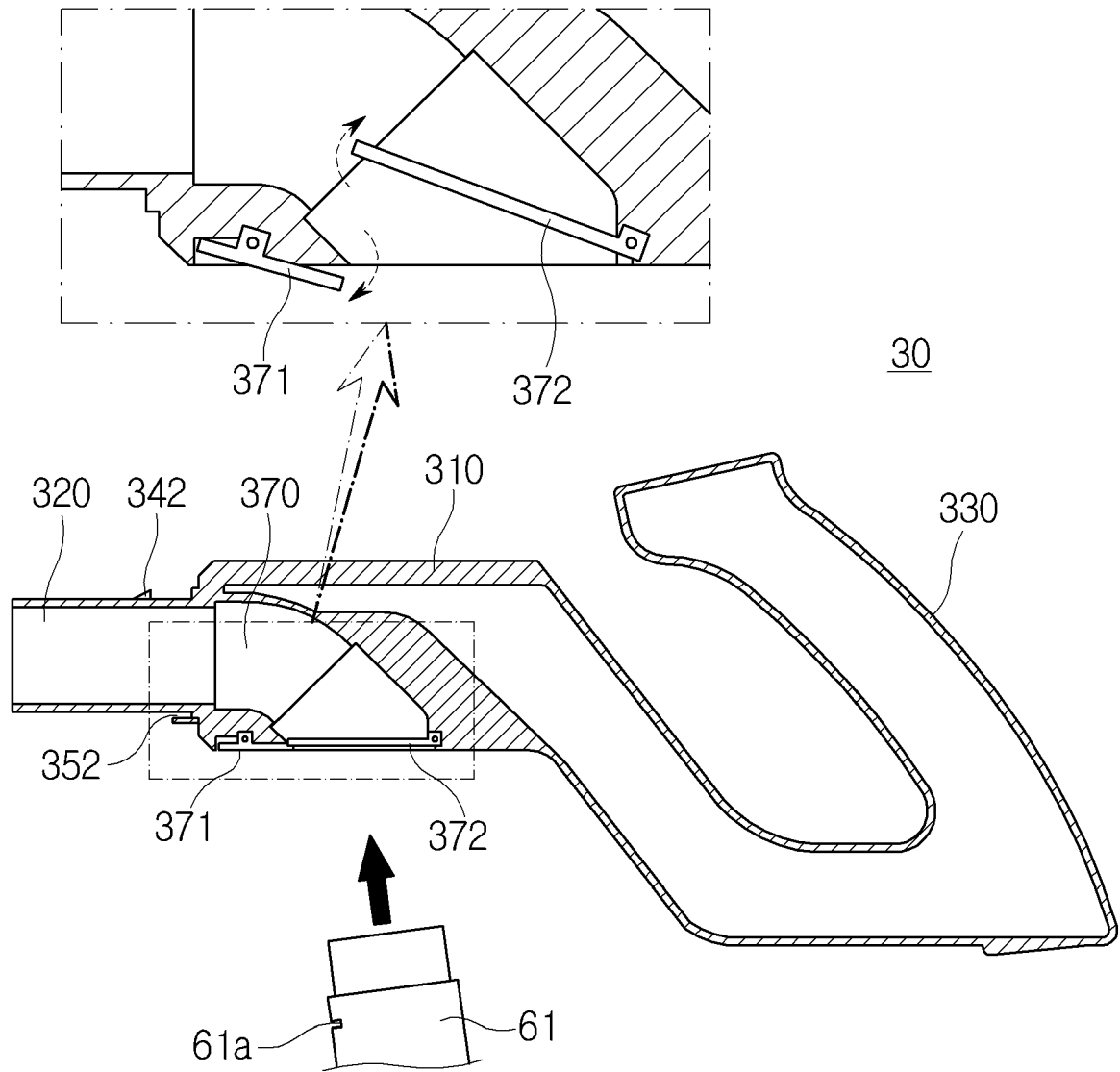
[FIG. 12]



[FIG. 13]



[FIG. 14]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2021/013653

A. CLASSIFICATION OF SUBJECT MATTER

A47L 9/24(2006.01)i; A47L 9/26(2006.01)i; A47L 5/22(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)

A47L 9/24(2006.01); A47L 11/20(2006.01); A47L 5/24(2006.01); A47L 9/00(2006.01); A47L 9/04(2006.01);
A47L 9/28(2006.01); A47L 9/32(2006.01)

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

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

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

eKOMPASS (KIPO internal) & keywords: 모듈(module), 청소기(cleaner), 악세서리(accessory), 핸들(handle), 배터리(battery),
연결(connect), 걸레(mop), 캐니스터(canister)**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 105832246 B (ECOVACS ROBOT LIMITED BY SHARE LTD.) 15 January 2019 (2019-01-15) See paragraphs [0029]-[0037] and figures 1-10.	1-6
Y		7-17
A		18-19
Y	KR 10-2125617 B1 (RUG DOCTOR, LLC) 07 July 2020 (2020-07-07) See paragraphs [0030]-[0031] and figure 1.	7-11
Y	KR 10-2020-0013563 A (LG ELECTRONICS INC.) 07 February 2020 (2020-02-07) See paragraphs [0062] and [0065] and figures 2-3.	12
Y	JP 2014-200406 A (MAKITA CORP.) 27 October 2014 (2014-10-27) See paragraphs [0036]-[0043] and figures 1-12.	13-15

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

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“&” document member of the same patent family

Date of the actual completion of the international search

13 January 2022

Date of mailing of the international search report

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Authorized officer

Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2021/013653

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International application No.

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