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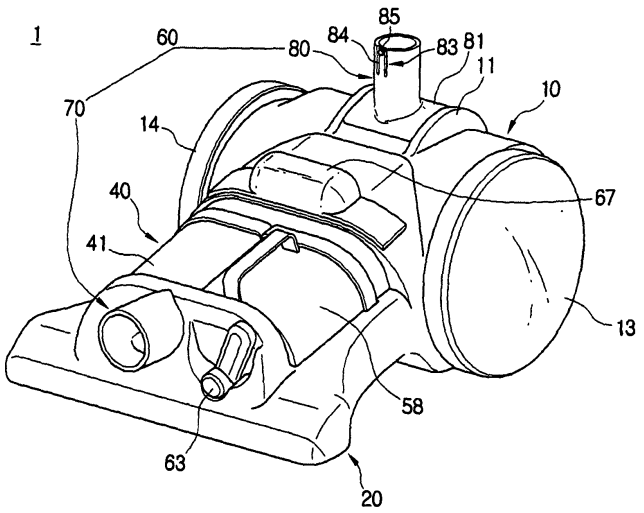
(54) Vacuum cleaner for using as both canister form and stick form

(57) A vacuum cleaner for use in either a canister form or a stick form is disclosed. The vacuum cleaner includes a cleaner body (10), a suction unit (20) having an air suction opening formed in a bottom surface of the cleaner body (10) to drawn in air, a dust collecting unit (40) disposed in the cleaner body to separate dust or dirt from the air and to collect and store the dust or dirt therein, and a mode selecting unit (60) on the cleaner body (10) to select one of a first mode and a second mode. The first mode is a mode where a handle member for moving the cleaner body is connected to the cleaner body and the suction unit (20) and the dust collecting unit (40) are communicated with each other. The second mode is a mode where an external accessory is connected to the cleaner body (10) to communicate with the dust collecting unit (40).

FIG. 1



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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present disclosure relates to a vacuum cleaner. More particularly, the present disclosure relates to a vacuum cleaner that can selectively be used in either a canister form or a stick form.

2. Description of the Related Art

[0002] In general, a vacuum cleaner is classified into a canister vacuum cleaner, a stick vacuum cleaner, etc.

[0003] The canister vacuum cleaner is usually configured, so that a cleaner body and a suction nozzle are separated from each other and at the same time, in fluid connecttion with each other through an extended tube and a flexible hose. Such a canister vacuum cleaner is advantageous in that since to clean a surface to be cleaned, only the suction nozzle is moved along the surface to be cleaned, the cleaning operation can be carried out with a relatively small force. Accordingly, the canister vacuum cleaner is good to clean a relatively wide cleaning area. However, the canister vacuum cleaner is disadvantageous in that since the cleaner body and the suction nozzle are connected to each other through the extended tube and the flexible hose, an entire length thereof is lengthened. Thus, the canister vacuum cleaner is difficult to handle and keep.

[0004] To the contrary, the stick vacuum cleaner is configured, so that the suction nozzle is integrally formed with the vacuum cleaner, which is moved along the surface to be cleaned. To move and carry the cleaner body, an elongated handle or stick is formed on the cleaner body. Accordingly, the stick vacuum cleaner is advantages in that since its length or volume is reduced, it is relatively easy to handle and keep. However, the stick vacuum cleaner is disadvantages in that since to clean the surface to be cleaned in cleaning, both the cleaner body and the suction nozzle are moved along the surface to be cleaned, the cleaning operation should be carried out with a relatively large force. Thus, the stick vacuum cleaner is good to clean a relatively small cleaning area in a short time.

[0005] Accordingly, if user possesses both the canister vacuum cleaner and the stick vacuum cleaner, she or he will select either the canister vacuum cleaner or the stick vacuum cleaner according to cleaning conditions including a size and area of cleaning area in cleaning, thereby allowing her or him to more easily and conveniently clean the cleaning area. However, possessing both the canister vacuum cleaner and the stick vacuum cleaner may not only be stressful in economics, but also it is undesirable in use efficiency.

[0006] Therefore, there is need for vacuum cleaners that can selectively used in either the canister form or the stick form, as occasion demands.

SUMMARY OF THE INVENTION

[0007] An aspect of the present disclosure is to address at least the above problems and/or disadvantages and to provide at least the advantages described below. Accordingly, an aspect of the present disclosure is to provide a vacuum cleaner that is capable of selectively being used as one of the canister form and the stick form as occasion demands, thereby allowing user's economic burden to reduce and allowing the vacuum cleaner to improve use efficiency.

[0008] Another aspect of the present disclosure is to provide a vacuum cleaner that can be used in both a canister form and a stick form, capable of being easily changed into one of the canister form and the stick form by simple actions, thereby increasing user's convenience.

[0009] In accordance with an aspect of the present disclosure, a vacuum cleaner for use in either a canister form and a stick form includes a cleaner body, a suction unit having an air suction opening formed in a bottom surface of the cleaner body to drawn in air, a dust collecting unit disposed in the cleaner body to separate dust or dirt from the air and to collect and store the dust or dirt therein, and a mode selecting unit disposed on the cleaner body to select one of a first mode and a second mode. Here, the first mode is a mode where a handle member for moving the cleaner body is connected to the cleaner body and the suction unit and the dust collecting unit are communicated with each other and the second mode is a mode where an external accessory is connected to the cleaner body to communicate with the dust collecting unit.

[0010] The dust collecting unit may include at least one cyclone, and a dust bin unit to collect and store the dust or dirt separated by the cyclone therein. At this time, the cyclone may includes a cyclone body disposed in such a manner that a longitudinal axis thereof is horizontally arranged and having an air inlet and an air outlet, a guide member disposed on one side of the cyclone body in the cyclone body to guide the air flowing in through the air inlet, an outflow pipe disposed on the other side of the cyclone body to communicate with the air outlet, and a dust discharging opening formed to a portion of the other side of the cyclone body to face the dust bin unit. In addition, the dust bin unit may include a dust bin detachably disposed on the cleaner body to be parallel thereto and having an opened end to communicate with the dust discharging opening. To prevent the dust or dirt from spilling from the dust bin when it is dumped, the dust bin may include a dust spilling-prevention cover formed in such a size that at least a portion of the opened end of the dust bin is closed up, and elastically supported on a bottom portion of the opened end of the dust bin in such a manner that when the dust bin is mounted in the cleaner body, the dust spilling-prevention cover is folded in a direction

of closing up the opened end of the dust bin and when the dust bin is removed from the cleaner body, the dust spilling-prevention cover is unfolded in a direction of opening the opened end of the dust bin.

[0011] The mode selecting unit may include a handle connecting part disposed on the cleaner body to detachably fix the handle member, and a passage switching part disposed on an air passage between the suction unit and the dust collecting unit, so that the external accessory can be connected thereto. The passage switching part selectively communicates one of between the external accessory and the dust collecting unit and between the suction unit and the dust collecting unit according to whether the external accessory is connected thereto. At this time, the handle member may include one of a tube shape having a grip or an operating handle, a stick shape having a grip, a shape in which an extended tube and the operating handle are connected with each other, and a shape in which the extended tube, the operating handle and a flexible hose are connected to one another. Also, the external accessory may include one of a suction nozzle assembly in which a suction nozzle and a flexible hose are connected with each other, and a suction nozzle/handle assembly in which the suction nozzle, an extended tube, an operating handle and the flexible hose are connected with one another.

[0012] The handle connecting part may include a pivot body disposed on one side of the cleaner body to be pivotable in a certain angle, and a fixing member to detachably fix a lower end of the handle member to the pivot body. The fixing member may include a fixing protrusion formed on an upper end of the pivot body, and a protrusion-accommodating hole formed in the lower end of the handle member to accommodate the fixing protrusion.

[0013] The passage switching part may include a tube member connected to at least one of the suction unit and a connecting part of the external accessory to communicate one of the suction unit and the external accessory with the dust collecting unit, and a blocking member disposed in the tube member to block an air passage between the external accessory and the dust collecting unit when a connection between the connecting part of the external accessory and the tube member is released.

[0014] Preferably, but not necessarily, the tube member includes a T-lettered or Y-lettered tube comprising a first tube part having one end connected with the connecting part of the external accessory, a second tube part having one end connected with the suction unit, and a third tube part having one end connected with the other ends of the first and the second tube parts and the other end connected with the dust collecting unit. Also, preferably, but not necessarily, the blocking member includes a blocking plate supported between an inlet portion of the third tube part toward the second tube part and an inlet portion of the third tube part toward the first tube part to be elastically pivotable, so that the blocking member closes up the inlet portion of the third tube part toward the second tube part when the connecting part of the external accessory is connected to the first tube part and closes up the inlet portion of the third tube part toward the first tube part when the connecting part of the external accessory is removed from the first tube part.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0015] The above and other objects, features, and advantages of certain exemplary embodiments of the present disclosure will be more apparent from the following description taken in conjunction with the accompanying drawings, in which:

[0016] FIG. 1 is a perspective view exemplifying a vacuum cleaner for use in either a canister form or a stick form according to an exemplary embodiment of the present disclosure from which a handle member and an external accessory are removed;

[0017] FIG. 2 is a cross-sectional top plan view of the vacuum cleaner illustrated in FIG. 1;

[0018] FIGS. 3A and 3B are a perspective view and a partial perspective view, respectively, exemplifying an operation of a dust spilling-prevention cover of a dust bin of the vacuum cleaner illustrated in FIG. 1;

[0019] FIGS. 4A and 4B are partial cross-sectional views exemplifying an operation of a blocking member of a passage switching part of a mode selecting unit of the vacuum cleaner illustrated in FIG. 1;

[0020] FIG. 5 is a perspective view exemplifying an example of the vacuum cleaner illustrated in FIG. 1 when it is used as the stick form;

[0021] FIGS. 6A and 6B are perspective views exemplifying another examples of the vacuum cleaner illustrated in FIG. 1 when it is used as the stick form;

[0022] FIG. 7 is a perspective view exemplifying an example of the vacuum cleaner illustrated in FIG. 1 when it is used as the canister form; and

[0023] FIG. 8 is a perspective view exemplifying another example of the vacuum cleaner illustrated in FIG. 1 when it is used as the canister form.

[0024] Throughout the drawings, the same reference numerals will be understood to refer to the same elements, features, and structures.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0025] Hereinafter, a vacuum cleaner for use in either a canister form or a stick form according to exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawing figures.

[0026] FIG. 1 is a perspective view exemplifying a vacuum cleaner for use in either a canister form or a stick form according to an exemplary embodiment of the present disclosure, and FIG. 2 is a cross-sectional top plan view of the vacuum cleaner illustrated in FIG. 1.

[0027] As illustrated in FIGS. 1 and 2, the vacuum cleaner 1 for use in either the canister form or the stick

form according to the exemplary embodiment of the present disclosure includes a cleaner body 10, a suction unit 20, a dust collecting unit 40, and a mode selecting unit 60.

[0028] To move the cleaner body 10 along a surface to be cleaned, left and right wheels 13 and 14 are installed on both sides of the rear of the cleaner body 10. As illustrated in FIG. 2, in the rear of the cleaner body 10 on which the left and the right wheels 13 and 14 are installed are disposed a suction motor 21 by which a suction force is provided and a cord reel 18 on which an electric cord is wound. If an external power is not used as a power for driving the suction motor 21 of the vacuum cleaner 1, a battery (not illustrated) may be installed in the place on which the cord reel 18 is disposed, instead of the cord reel 18,

[0029] The suction unit 20, which draws in dust or dirt adhered to the surface to be cleaned in a first cleaning mode to be described later, is installed in a lower side of the front of the cleaner body 10. As illustrated in FIG. 3A, the suction unit 20 has an air suction opening 22 formed in a bottom surface of the cleaner body 10. Alternatively, to increase an efficiency for drawing in the dust or dirt adhered to the surface to be cleaned, the suction unit 20 can further include a brush (not illustrated) implanted in the vicinity of the air suction opening 22, or a brush roller (not illustrated) rotatably disposed on the bottom surface of the cleaner body 10.

[0030] The dust collecting unit 40, which separates and collects the dust or dirt from the drawn-in air by using the suction force of the suction motor 21, is disposed inside the front of the cleaner body 10. As illustrated in FIG. 2, the dust collecting unit 40 includes a cyclone 41, a dust bin unit 58, and a filter 65.

[0031] The cyclone 41 separates relatively large dust or dirt out of the air drawn in from the outside by the suction force of the suction motor 21. For this, the cyclone 41 is provided with a cyclone body 43 disposed inside the front of the cleaner body 10 in such a manner that a longitudinal axis thereof is horizontally arranged. The cyclone body 43 is formed in a cylinder shape having an air inlet 44 and an air outlet 45 formed in one side of a front end and the middle of a rear end thereof, respectively. To guide the air drawn into the cyclone body 43 through the air inlet 44, a guide member 46 is disposed in a front end side of the cyclone body 43. The guide member 46 is provided with a guide pipe 47 and a spiral blade 48, so that it guides the air drawn into the cyclone body 43 to whirl in a spiral shape. An outflow pipe 49 is disposed in a rear end side of the cyclone body 43, so that it communicates with the air outlet 45. The outflow pipe 49 guides the air whirling in the spiral shape by means of the guide member 46 in the cyclone body 43 to rotate in a spiral shape and at the same time, to discharge through the air outlet 45. A dust discharging opening 50 is formed in one side of the rear end of the cyclone body 43, so that it faces a dust guide 51. The dust guide 51 guides the dirt or dust discharged through the dust discharging opening 50 due to the centrifugal force, into a dust bin 59 of the dust bin unit 58, which will be described.

[0032] The dust bin unit 58 collects and stores the dust or dirt discharged along the dust guide 51 through the dirt discharging opening 50 thereon. The dust bin unit 58 includes a dust bin 59, which is disposed detachably and parallel to the cleaner body 10. The dust bin 59 is formed in a hexahedral bin shape having an opened end 59a, which communicates with the dust guide 51. Preferably, but not necessarily, the dust bin 59 is formed of a transparent plastic material so as to allow a user to easily perceive whether it is filled with the dust or dirt. On an upper surface of the dust bin 59 is formed a dust bin handle 69 for moving the dust bin 59 to mount in or remove from the cleaner body 10.

[0033] As illustrated in FIGS. 3A and 3B, to prevent the dust or dirt from spilling to the outside when the dust bin 59 is separated and removed from the cleaner body 10, a dust spilling-prevention cover 61 is disposed on a bottom portion of the opened end 59a of the dust bin 59. The dust spilling-prevention cover 61 is made up of a rectangular plate formed in such a size that at least a portion of the opened end 59a of the dust bin 59 is closed up. The dust spilling-prevention cover 61 is elastically supported on the bottom portion of the opened end 59a of the dust bin 59 by an elastic spring 62 in such a manner that when the dust bin 59 is mounted in the cleaner body 10 as illustrated in FIG. 3B, it is folded in a direction of closing up the opened end 59a of the dust bin 59 and when the dust bin 59 is removed from the cleaner body 10 as illustrated in FIG. 3A, it is unfolded in a direction of opening the opened end 59a of the dust bin 59.

[0034] To fix the dust bin 59 in a state where it comes in close contact with the dust guide 51, a fixing and detaching lever 63 is disposed on a front end side of the dust bin 59 in the cleaner body 10. The fixing and detaching lever 63 is provided with a cam 64 having a cam surface, which presses a front end surface of the dust bin 59 while coming in contact therewith or which is separated from the front end surface of the dust bin 59, according to a rotated angle. Accordingly, after the dust bin 50 is mounted in the cleaner body 10, if the fixing and detaching lever 63 is rotated in such a direction that the cam surface of the cam 64 presses the front end surface of the dust bin 59 while coming in contact therewith, the dust bin 59 is fixed in a state where a rear end surface thereof comes in close contact with the dust guide 51.

[0035] The filter 65 separates minute dust or dirt, which is not separated by the cyclone 41, and is disposed between the suction motor 21 and the air outlet 45 of the cyclone body 43 of the cyclone 41. The filter 65 may be made up of a sponge type filter, a high efficiency particulate arrestor (HEPA) filter, or a combination thereof. A filter handle 67 for mounting and dismounting the filter 65 in and from the cleaner body 10 is disposed on an upper part of the filter 65, which is projected to the outside of the cleaner body 10.

[0036] As illustrated in FIGS. 5 and 7, the mode selecting unit 60 allows the user to change the cleaner body 10 into either a first cleaning mode (see FIG. 5) for using as a stick form or a second cleaning mode (see FIG. 7) for using as a canister form according to user's need. Here, the first cleaning mode is a mode where a handle member 15 for using the cleaner body 10 as the stick form is connected to the cleaner body 10 and the suction unit 20 and the dust collecting unit 40 are communicated with each other, and the second cleaning mode is a mode where the handle member 15 is removed from the cleaner body 10 and an external accessory for using the cleaner body 10 in the canister form is connected to the cleaner body 10 to communicate with the dust collecting unit 40. The handle member 15 is made up of a tube with a grip, as illustrated in FIG.5, and is provided as an accessory, which is selectively usable according user's need, by a manufacturing company. The external accessory is made up of a suction nozzle/handle assembly including a suction nozzle 16, a variable extended tube 17, an operating handle 18, and a flexible hose 19, as illustrated in FIG. 7.

[0037] The mode selecting unit 60 includes a handle connecting part 80 (see FIGS. 1 and 5) disposed on the cleaner body 10 to detachably fix the handle member 15, and a passage switching part 70 (see FIGS. 4A and 4B) to selectively communicate either between the suction nozzle 16 and the dust collecting unit 40 or between the suction unit 20 and the dust collecting unit 40 according to whether the external accessory, that is, the flexible hose 19 of the suction nozzle/handle assembly is connected to the cleaner body 10.

[0038] As illustrated in FIGS. 1 and 5, the handle connecting part 80 is made up of a pivot body 81 and a fixing member 83. The pivot body 81 is formed of a T-lettered tube having both ends disposed on a rotating axis (not illustrated) of an upper portion 11 of the cleaner body 10 to be pivotable in a certain angle, for example, an angle of 60 through 90 degrees. The fixing member 83, which detachably fixes a lower end of the handle member 15 to the pivot body 81, is provided with a fixing protrusion 85 (see FIG. 1) formed on an upper end of the pivot body 81 to be elastically ascendable and descendable, and a protrusion-accommodating hole 86 (see FIG. 5) formed in the lower end of the handle member 15 to accommodate the fixing protrusion 85. When the lower end of the handle member 15 is inserted around an outer circumferential surface of the upper end of the pivot body 81, the fixing protrusion 85 is inserted into the protrusion-accommodating hole 86, and thus the lower end of the handle member 15 is fixed to the upper end of the pivot body 81. On the lower end of the handle member 15 in the vicinity of the protrusion-accommodating hole 86 is disposed a pushing button 87, which pushes down the fixing protrusion 85 inserted in the protrusion-accommodating hole 86 to release a locking connection between the fixing protrusion 85 and the protrusion-accommodating hole 86.

[0039] Alternatively, the fixing member 83 can be formed in the form of other connecting members, such as male and female screws.

[0040] As illustrated in FIG. 5, to maintain the handle member 15 in a vertical position in stand-by or storage, a position maintaining member (not illustrated) can be formed between the pivot body 81 and an upper portion 11 of the cleaner body 10 corresponding thereto. The position maintaining member may be made up of at least one projection (not illustrated) formed on the pivot body 81, and a projection-accommodating groove (not illustrated) in the upper portion 11 of the cleaner body 10 corresponding to the projection.

[0041] Accordingly, in the first cleaning mode, when the handle member 15 is fixed to the pivot body 81 through the fixing member 83, it can be pivoted in the range of the certain angle, that is, the angle of 60 through 90 degrees, by the pivot body 81.

[0042] As illustrated in FIGS. 4A, 4B and 7, the passage switching part 70 is disposed on an air passage between the suction unit 20 and the dust collecting unit 40, so that the flexible hose 19 of the suction nozzle/handle assembly can be connect thereto. The passage switching part 70 includes a tube member 71 and a blocking member 77. The tube member 71 is formed of a T-lettered or Y-lettered tube connected to the suction unit 20 or the suction unit 20 and a connecting part 19a of the flexible hose 19 to communicate the suction unit 20 or the suction nozzle 16 with the cyclone 41. The tube member 71 is provided with a first tube part 72 having one end detachably connected with the connecting part 19a, a second tube part 73 having one end connected with the suction unit 20, and a third tube part 74 having one end connected with the other ends of the first and the second tube parts 72 and 73 and the other end connected with the cyclone 41. Although there is not illustrated, the connection between the connecting part 19a and the first tube part 71 can be obtained by various methods, such as a screw connection or a hooking connection as in the fixing member 83 explained with reference to FIGS. 1 and 5, within the limit that a certain airtightness is maintain between the connecting part 19a and the first tube part 71 so as not to deteriorate the suction pressure.

[0043] The blocking member 77 is made up of a blocking plate 78 pivotably supported between an inlet portion 74b of the third tube part 74 toward the second tube part 73 and an inlet portion 74a of the third tube part 74 toward the first tube part 72, so that it can be moved between a first position (see FIG. 4A) where it closes up the inlet portion 74a of the third tube part 74 toward the first tube part 72 and a second position (see FIG. 4B) where it closes up the inlet portion 74b of the third tube part 74 toward the second tube part 73. The blocking plate 78 is elastically urged by an elastic spring 79, so that it is maintained in the first position. Accordingly, the blocking plate 78 is moved to the second position by the connecting part 19a of the flexible hose 19 moving against the elastic

restoring force of the elastic spring 79 when the connecting part 19a is connected to the first tube part 72 for the second cleaning mode, as illustrated in FIG. 4B, and returned to the first position by an elastic restoring force of the elastic spring 79 when the connecting part 19a is removed from the first tube part 72 for the first cleaning mode, as illustrated in FIG. 4A.

[0044] In the above description, although the handle member 15 is illustrated and explained as formed in the tube shape having the grip as illustrated in FIG. 5, the present disclosure is not limited thereto. For instance, the handle member 15 can be formed in a tube shape having an operating panel (not illustrated), a stick shape (not illustrated) having a grip, a shape in which the variable extended tube 17 and the operating handle 18 provided as accessories are connected with each other, as illustrated in FIG. 6A, or a shape in which the variable extended tube 17, the operating handle 18 and the flexible hose 19 are connected to one another, as illustrated in FIG. 6B.

[0045] Also, although the suction nozzle/handle assembly in which the suction nozzle 16, the variable extended tube 17, the operating handle 18 and flexible hose 19 are connected with one another is illustrated and explained as used as the external accessory for using the cleaner body 10 as the canister form, the present disclosure is not limited. For instance, as illustrated in FIG. 8, a suction nozzle assembly in which a suction nozzle 14 for cleaning a narrow area and a flexible hose 19 are connected with each other can be used as the external accessory.

[0046] Hereinafter, an operation of the vacuum cleaner 1 for use in either the canister form or the stick form will be now explained in detail with reference to FIGS. 1 through 5 and 7.

[0047] First, it is assumed that the cleaner body 10 is in a state illustrated in FIG. 1. In this state, to quickly clean a relatively narrow cleaning area, if the user want to use the cleaner body 10 as the stick form, that is, the first cleaner mode, she or he inserts the lower end of the handle member 15 around the upper end of the pivot body 81. At this time, the fixing protrusion 85 is inserted into the protrusion-accommodating groove 86, and thus the lower end of the handle member 15 is fixed to the upper end of the pivot body 81. As a result, the handle member 15 can be pivoted up and down in the range of a certain angle, that is, an angle of 60 through 90 degrees, with respect to the cleaner body 10 by the pivot body 81.

[0048] At this time, since the passage switching part 70 in the state illustrated in FIG. 1, the blocking plate 78 of the blocking member 77 is positioned in the first position by the elastic spring 79, as illustrated in FIG. 4A. That is, the blocking plate 78 closes up the first tube part 72 of the tube member 71 to block the air passage between the outside and the dust collecting unit 40 and opens the second tube part 73 to open the air passage between the suction unit 20 and the dust collecting unit 40.

[0049] Under the state, if the vacuum cleaner 1 is supplied with the power and at the same time, the cleaner body 10 is moved along a surface to be cleaned in the relatively narrow cleaning area, air laden with dust or dirt is drawn into the cyclone body 43 through the air suction opening 22 of the suction unit 20, the second tube part 73 of the tube member 71 and the air inlet 44 from the surface to be cleaned. The drawn-in air forms a whirling current through the guide member 46 and the outflow pipe 49. As a result, relatively large dust or dirt included in the drawn-in air is discharged through the dust discharging opening 50 due to the centrifugal force, and collected and stored in the dust bin 59 through the dust guide 51. And, the dust-removed air passes through the outflow pipe 49 and is discharged to a motor chamber 23 in which the suction motor 21 is installed, through the air outlet 45 and the filter 65. Here, dust or dirt larger than minute holes of the filter 65 does not flow into the motor chamber 23, but is filtered. The air flowing into the motor chamber 23 is discharged to the outside through an air discharging passage 24.

[0050] After the cleaning operation is completed as described above, if the user wants to dump the dust or dirt collected and stored in the dust bin 59, she or he rotates the fixing and detaching lever 63 in a certain angle. As a result, the cam surface of the cam 64 is separated from the front end surface of the dust bin 59, so that the rear end surface of the dust bin 59 is released from a state where it is fixed while coming in compression contact with the dust guide 51. Thus, the dust bin 59 can freely be removed from the cleaner body 10 with the dust bin handle 69. At this time, as illustrated in FIG. 3A, since the dust spilling-prevention cover 61 is unfolded parallel to a bottom surface of the dust bin 59 due to the elastic force of the elastic spring 62, the dust or dirt in the dust bin 59 is not spilled to the outside from the dust bin 59.

[0051] After that, as illustrated in FIG. 7, to clean a relatively wide cleaning area, if the user want to use the cleaner body 10 as the canister form, that is, the second cleaning mode, she or he separates and removes the lower end of the handle member 15 from the upper end of the pivot body 81. At this time, the fixing protrusion 85 is pushed down by the pushing button 87, so that it releases a locking to the protrusion-accommodating groove 86.

[0052] And then, as illustrated in FIG. 4B, the connecting part 19a of the flexible hose 19 of the suction nozzle/handle assembly is inserted into and fixed to the first tube part 72 of the tube member 71. At this time, the blocking plate 78 of the blocking member 77 is pushed against the elastic spring 79 by the connecting part 19a, so that it is moved to the second position. That is, the blocking plate 78 closes up the second tube part 73 of the tube member 79 to block the air passage between the suction unit 20 and the dust collecting unit 40 and opens the first tube part 72 to open the air passage between the suction nozzle 16 and the dust collecting unit 40.

[0053] Under the state, if the vacuum cleaner 1 is sup-

plied with the power and at the same time, the cleaner body 10 is moved along a surface to be cleaned in the relatively wide cleaning area, air laden with dust or dirt is drawn into the cyclone body 43 through an air suction opening (not illustrated) of the suction nozzle 16, the variable extended tube 17, the operating handle 18, the flexible hose 19, the first tube part 72 of the tube member 71, and the air inlet 44 from the surface to be cleaned. The air drawn in the cyclone body 43 passes through the dust collecting unit 40 and the filter 65 to remove the dust or dirt included therein and then goes out of the cleaner body 10 to the outside, in the same method as described above.

[0054] As apparent from the foregoing description, according to the exemplary embodiments of the present disclosure, the vacuum cleaner for use in either the canister form or the stick form is configured, so that it can be selected and used as either the canister form or the stick form according to the cleaning conditions including the size and the area of cleaning area in cleaning. Accordingly, the user does not need to possess both the canister vacuum cleaner and the stick vacuum cleaner to satisfy the various cleaning conditions, as in the conventional vacuum cleaners. Thus, the user's economical burden is not only reduced, but also the use efficiency for the cleaner can be improved.

[0055] Further, the vacuum cleaner for use in either the canister form or the stick form according to the exemplary embodiments of the present disclosure is configured, so that it can easily changed into the canister form or the stick form only by the operation of mounting the handle member, or the operations of dismounting the handle member and mounting the suction nozzle and/or handle assembly. Accordingly, the vacuum cleaner for use in either the canister form or the stick form according to the exemplary embodiments of the present disclosure is convenient and easy to use.

[0056] Also, the vacuum cleaner for use in either the canister form or the stick form according to the exemplary embodiments of the present disclosure is configured, so that the dust bin formed of the transparent plastic material is detachably fixed to the cleaner body. Accordingly, the dust or dirt collected and stored in the dust bin can be easily and frequently dumped, thereby preventing the dust-separating efficiency from being deteriorating due to the re-scattering of the dust or dirt collected and stored in the dust bin.

[0057] Although representative exemplary embodiments of the present disclosure have been shown and described in order to exemplify the principle of the present disclosure, the present disclosure is not limited to the specific embodiments. It will be understood that various modifications and changes can be made by one skilled in the art without departing from the spirit and scope of the disclosure as defined by the appended claims. Therefore, it shall be considered that such modifications, changes and equivalents thereof are all included within the scope of the present disclosure.

Claims

1. A vacuum cleaner for use in either a canister form or a stick form, comprising:

   a cleaner body (10);
   a suction unit (20) having an air suction opening (22) formed in a bottom surface of the cleaner body (10) to drawn in air;
   a dust collecting unit (40) disposed in the cleaner body (10) to separate dust or dirt from the air and to collect and store the dust or dirt therein; and
   a mode selecting unit (60) disposed on the cleaner body (10) to select one of a first mode and a second mode, the first mode being a mode where a handle member (15) for moving the cleaner body (10) is connected to the cleaner body and the suction unit (20) and the dust collecting unit (40) are communicated with each other so as to operate in the stick form and the second mode being a mode where an external accessory is connected to the cleaner body (10) to communicate with the dust collecting unit (40) so as to operate in the canister form.

2. The vacuum cleaner as claimed in claim 1, wherein the dust collecting unit (40) comprises:

   at least one cyclone (41); and
   a dust bin unit (58) to collect and store the dust or dirt separated by the cyclone (41) therein.

3. The vacuum cleaner as claimed in claim 2, wherein the cyclone (41) comprises:

   a cyclone body (43) disposed in such a manner that a longitudinal axis thereof is horizontally arranged and having an air inlet (44) and an air outlet (45);
   a guide member (46) disposed on one side of the cyclone body (43) in the cyclone body to guide the air flowing in through the air inlet (44);
   an outflow pipe (49) disposed on the other side of the cyclone body (43) to communicate with the air outlet (45); and
   a dust discharging opening (50) formed to a portion of the other side of the cyclone body (43) to face the dust bin unit (58).

4. The vacuum cleaner as claimed in claim 3, wherein the dust bin unit (58) comprises a dust bin (59) detachably disposed on the cleaner body (10) to be parallel thereto and having an opened end to communicate with the dust discharging opening (50).

5. The vacuum cleaner as claimed in claim 4, wherein the dust bin (59) comprises a dust spilling-prevention

cover (61) formed in such a size that at least a portion of the opened end of the dust bin (59) is closed up, and elastically supported on a bottom portion of the opened end of the dust bin (59) in such a manner that when the dust bin (59) is mounted in the cleaner body (10), the dust spilling-prevention cover (61) is folded in a direction of closing up the opened end of the dust bin and when the dust bin (59) is removed from the cleaner body (10), the dust spilling-prevention cover (61) is unfolded in a direction of opening the opened end of the dust bin (59).

6. The vacuum cleaner as claimed in any of claims 1 to 5, wherein the mode selecting unit (60) comprises;
a handle connecting part (80) disposed on the cleaner body (10) to detachably fix the handle member (15); and
a passage switching part (70) disposed on an air passage between the suction unit (20) and the dust collecting unit (40), so that the external accessory can be connected thereto, the passage switching part (70) selectively communicating one of between the external accessory and the dust collecting unit (40) and between the suction unit (20) and the dust collecting unit (40) according to whether the external accessory is connected thereto.

7. The vacuum cleaner as claimed in claim 6, wherein the handle member (15) comprises one of a tube shape having a grip or an operating handle (18), a stick shape having a grip, a shape in which an extended tube (17) and the operating handle (18) are connected with each other, and a shape in which the extended tube, the operating handle and a flexible hose are connected to one another.

8. The vacuum cleaner as claimed in claim 6, wherein the external accessory comprises one of a suction nozzle assembly in which a suction nozzle (14) and a flexible hose (19) are connected with each other, and a suction nozzle/handle assembly in which the suction nozzle (16), an extended tube (17), an operating handle (18) and the flexible hose (19) are connected with one another.

9. The vacuum cleaner as claimed in claim 6, wherein the handle connecting part (80) comprises:

a pivot body (81) disposed on one side of the cleaner body (10) to be pivotable in a certain angle; and
a fixing member (83) to detachably fix a lower end of the handle member (15) to the pivot body (81).

10. The vacuum cleaner as claimed in claim 9, wherein the fixing member (83) comprises:

a fixing protrusion (85) formed on an upper end of the pivot body (81); and
a protrusion-accommodating hole (86) formed in the lower end of the handle member (15) to accommodate the fixing protrusion (85).

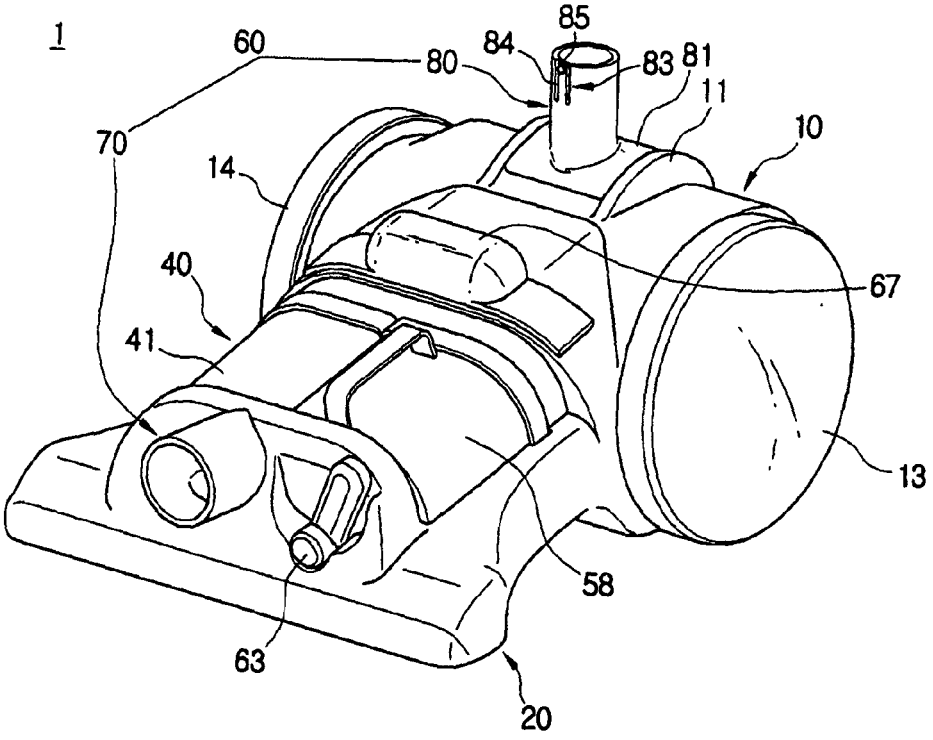
11. The vacuum cleaner as claimed in claim 6, wherein the passage switching part (70) comprises:

a tube member (71) connected to at least one of the suction unit (20) and a connecting part of the external accessory to communicate one of the suction unit (20) and the external accessory with the dust collecting unit(40); and
a blocking member (77) disposed in the tube member (71) to block an air passage between the external accessory and the dust collecting unit (40) when a connection between the connecting part of the external accessory and the tube member (71) is released.

12. The vacuum cleaner as claimed in claim 11, wherein the tube member (71) comprises a T-leftered or Y-lettered tube comprising a first tube part (72) having one end connected with the connecting part of the external accessory, a second tube part (73) having one end connected with the suction unit (20), and a third tube part (74) having one end connected with the other ends of the first and the second tube parts (72, 73) and the other end connected with the dust collecting unit (40).

13. The vacuum cleaner as claimed in claim 12, wherein the blocking member (77) comprises a blocking plate (78) supported between an inlet portion of the third tube part (74) toward the second tube part (73) and an inlet portion of the third tube part (74) toward the first tube part (72) to be elastically pivotable, so that the blocking member (77) closes up the inlet portion of the third tube part (74) toward the second tube part (73) when the connecting part of the external accessory is connected to the first tube part (72) and closes up the inlet portion of the third tube part (74) toward the first tube part (72) when the connecting part of the external accessory is removed from the first tube part (72).

FIG. 1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63
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FIG. 2

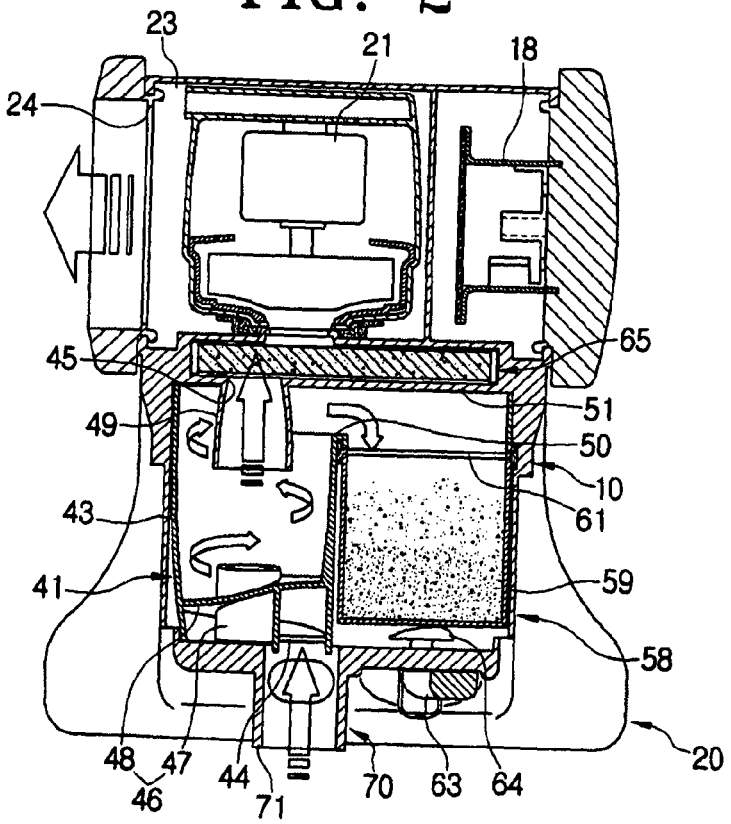
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FIG. 3A

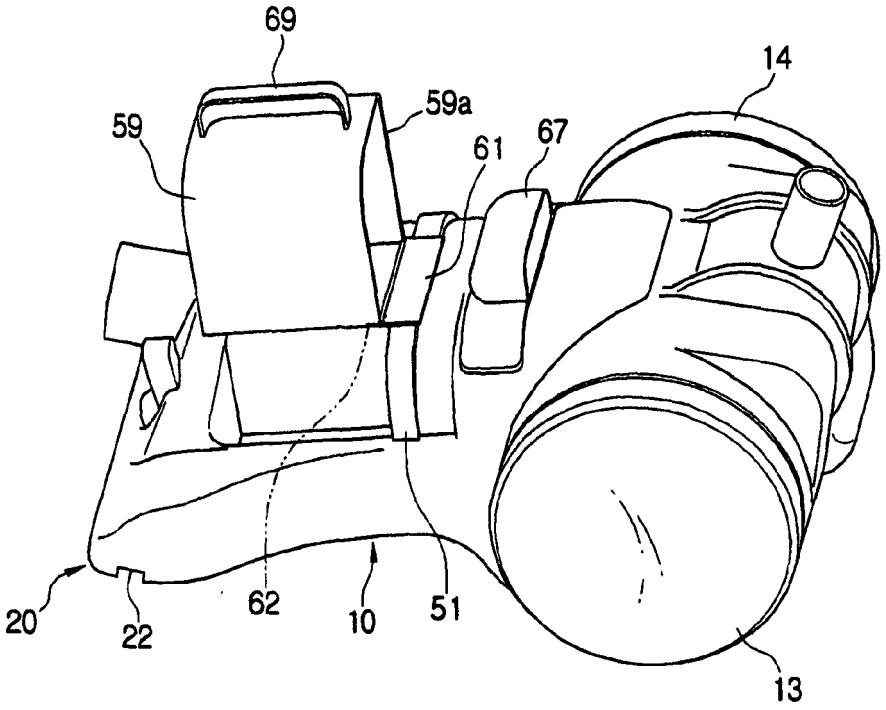

FIG. 3B

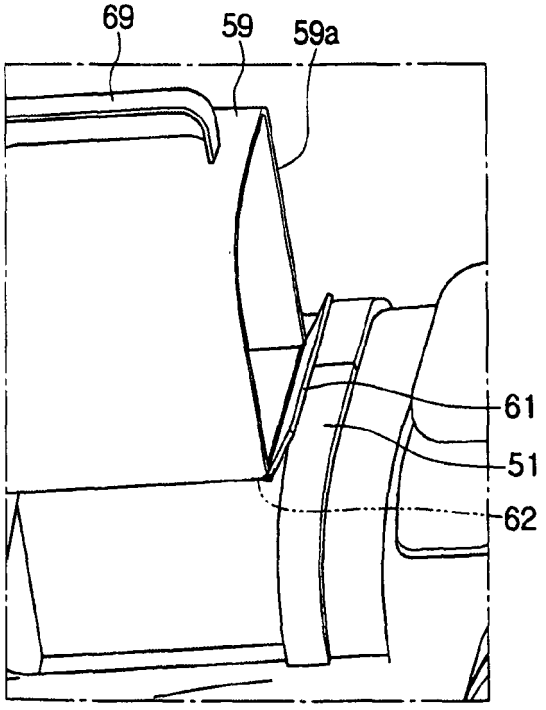

FIG. 4A

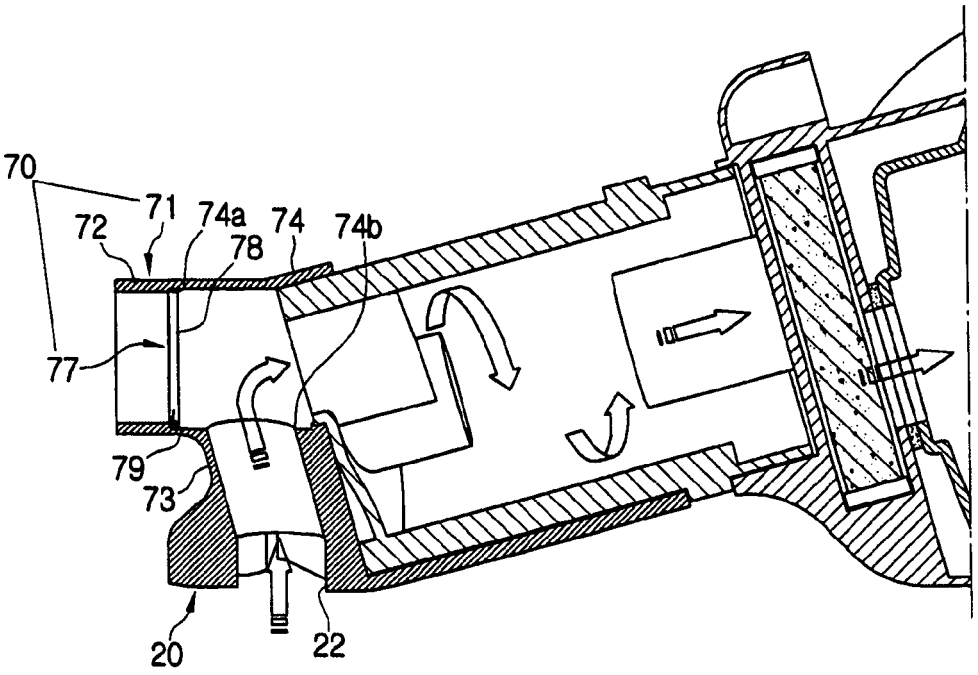
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FIG. 4B

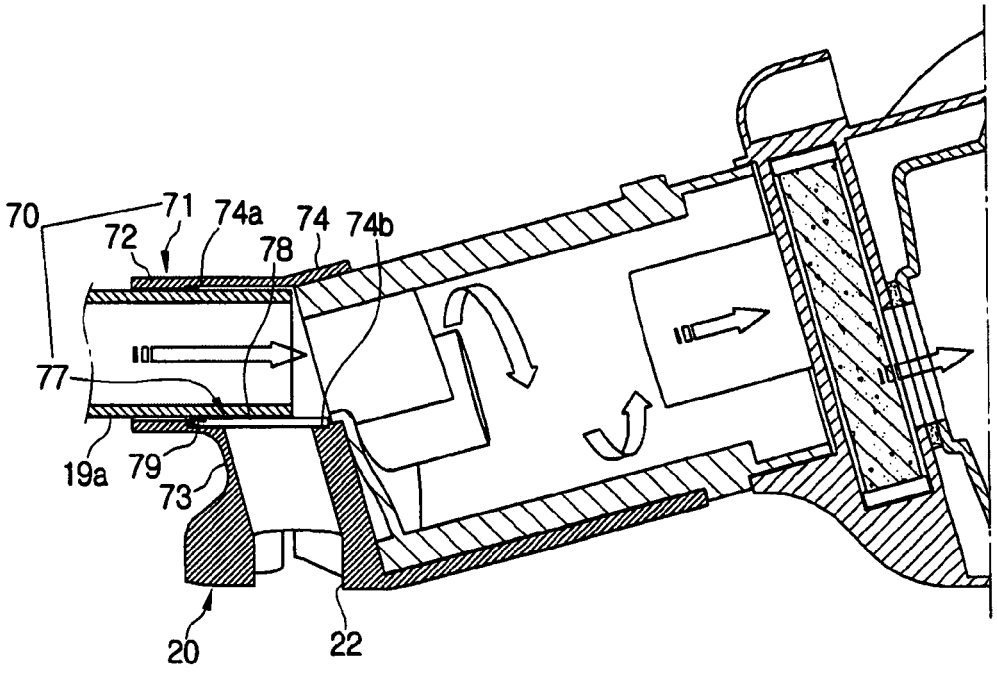
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FIG. 5

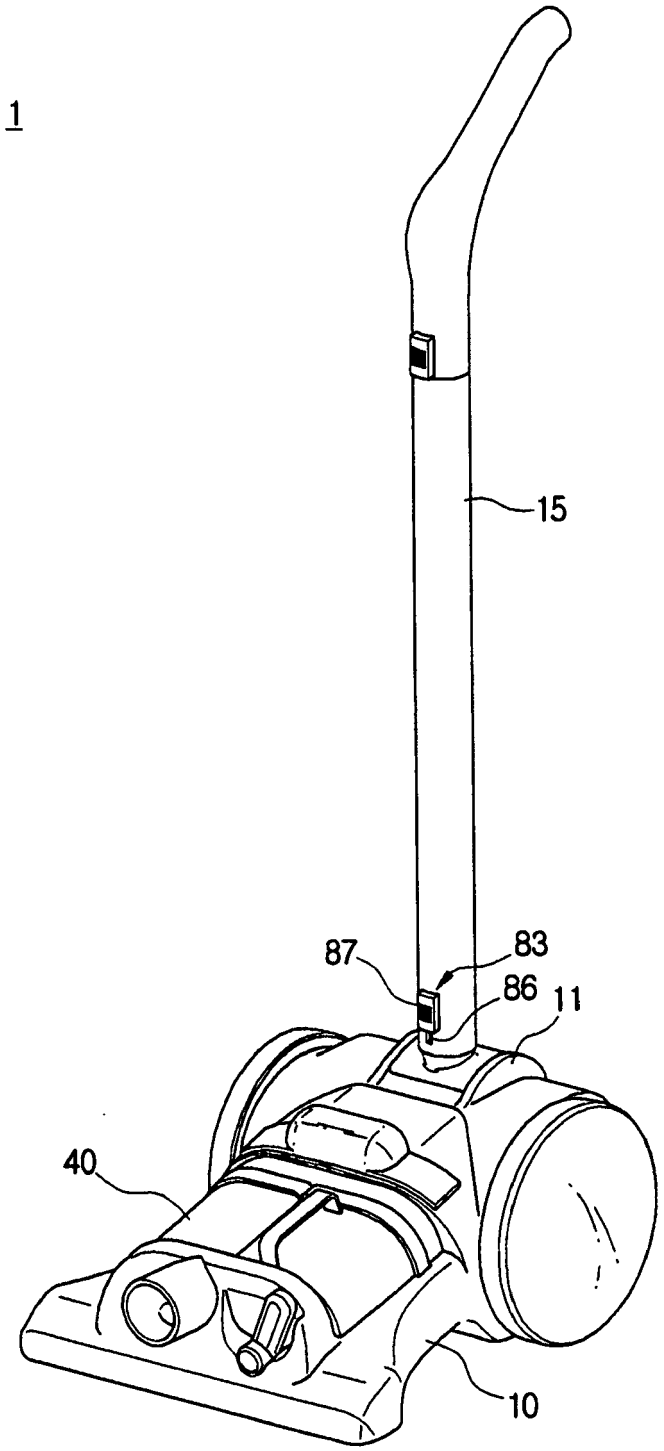

FIG. 6A

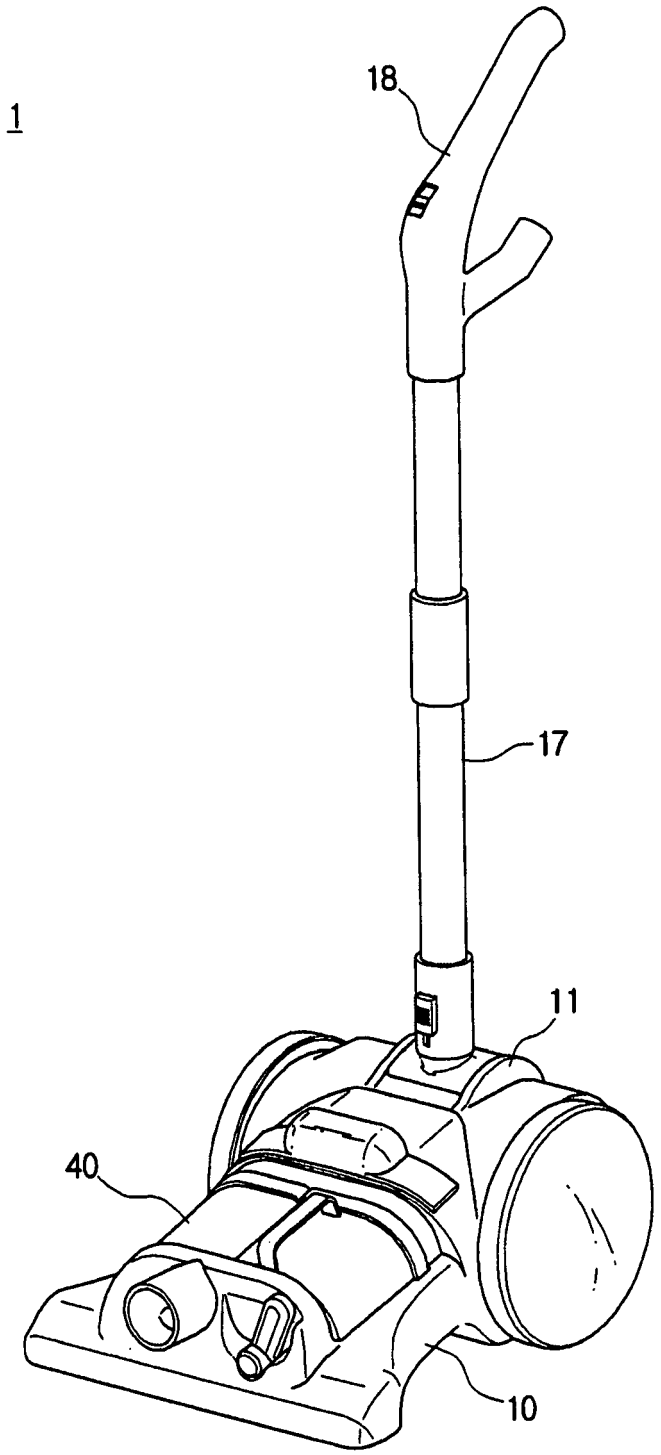

FIG. 6B

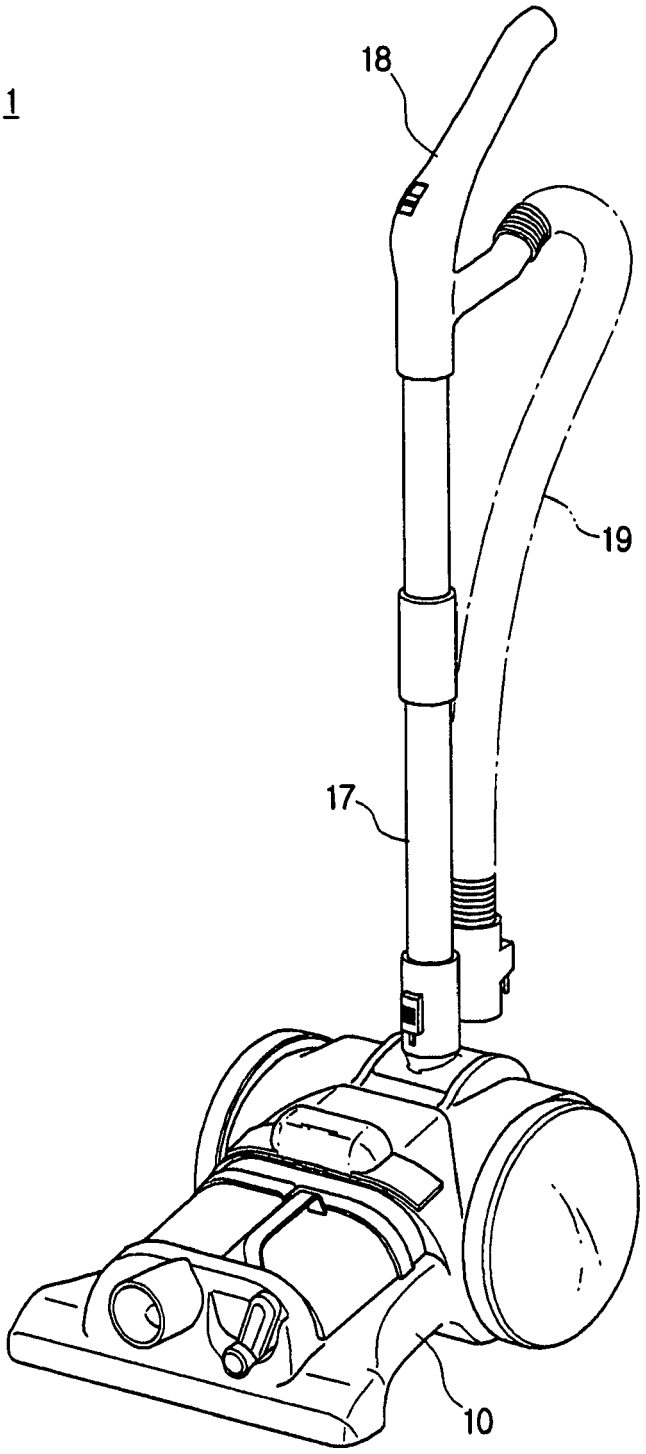

FIG. 7

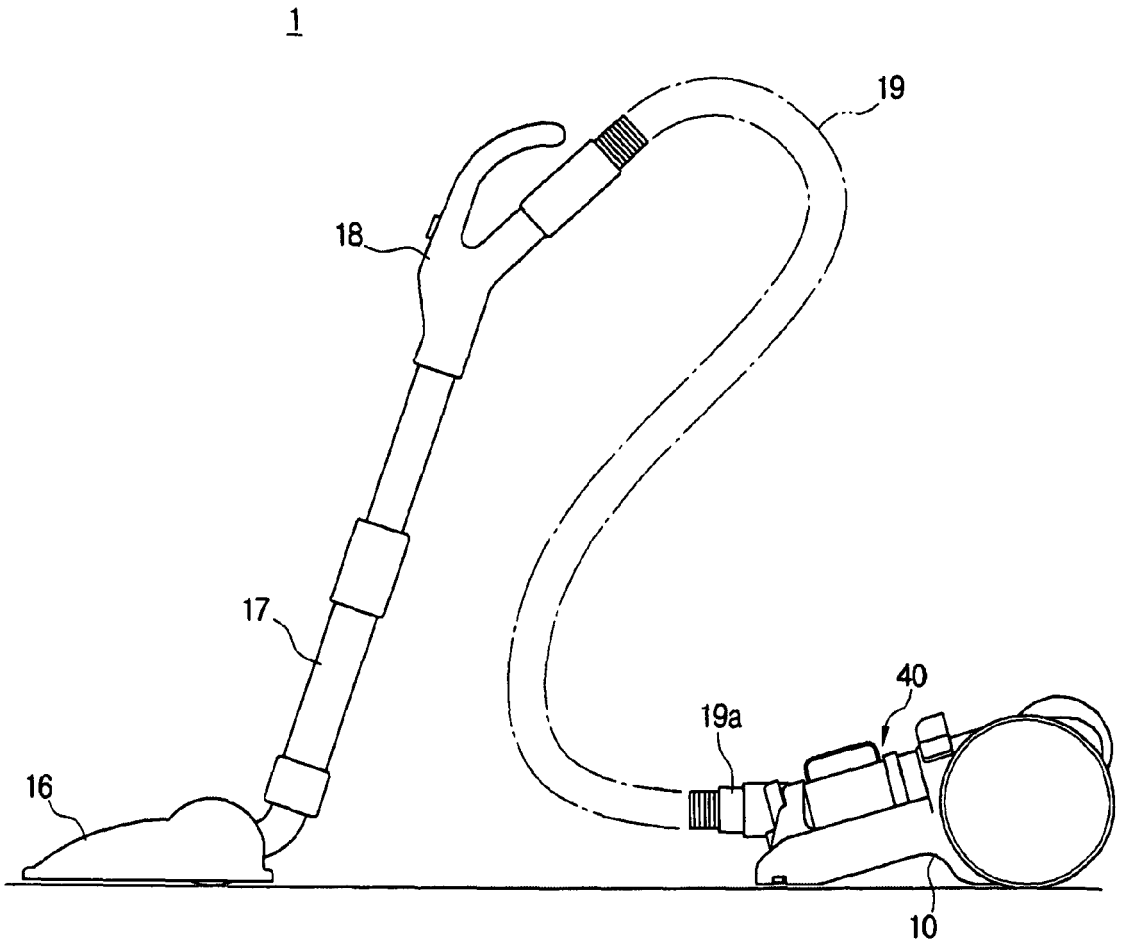

FIG. 8