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(54) **Vacuum cleaner**

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Description

[0001] Embodiments of the present disclosure relate to a vacuum cleaner capable of being used in an upright mode and a handheld mode.

[0002] In general, vacuum cleaners are appliances designed to do cleaning by suctioning dust along with air using a suction force generated from a fan rotated by a motor, separating the dust included in the suctioned air from the air, and collecting the separated dust.

[0003] Such vacuum cleaners often include a main body with a fan motor for generating a suction force, a head unit that is disposed in the front of the main body and suctions dust from a floor along with air, a handle grasped by a user so as to allow movement of the vacuum cleaner, and an extension frame that connects the handle and the main body and enables the user to move the main body in a standing posture.

[0004] A vacuum cleaner can include a first cleaner module that cleans a floor in an upright mode and a second cleaner module that is removably installed on the first cleaner module and is used in a handheld mode, thereby making it possible to be used in the upright mode and the handheld mode.

[0005] WO 97/20491 A1 discloses a suction cleaner comprising a primary cleaner and an auxiliary cleaner, removably attached to the primary cleaner.

[0006] It is an aspect of the present disclosure to provide a vacuum cleaner capable of efficiently doing cleaning according to a cleaning mode.

[0007] Additional aspects of the disclosure will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the disclosure.

[0008] In accordance with one aspect of the present disclosure, a vacuum cleaner includes a first cleaner module cleaning a floor in an upright mode, and a second cleaner module that is removably coupled to the first cleaner module and is separated from the first cleaner module so as to do cleaning in a handheld mode. The first cleaner module includes a first fan motor generating a suction force, and a first dust collection unit filtering foreign materials from air suctioned by the first fan motor, and the second cleaner module includes a second fan motor generating a suction force when used in the handheld mode, and a second dust collection unit filtering foreign materials from air suctioned by the second fan motor.

[0009] Here, the first fan motor may generate the suction force greater than that of the second fan motor.

[0010] Further, the second cleaner module may include a handle used for both cleaning in the upright mode and cleaning in the handheld mode.

[0011] Also, the first cleaner module may include a first body housing the first fan motor, a head unit that is disposed at a front side of the first body and suctions the air from the

[0012] floor, and an extension frame connected to the

first body, and the second cleaner module may be removably coupled to the extension frame.

[0013] Further, one of the extension frame and second cleaner module may include a protruding male coupler, and the other may include a female coupler to which the male coupler is coupled.

[0014] Further, one of the first and second cleaner modules may include a plug module, and the other may include a socket module to which the plug module is connected.

[0015] In addition, the first cleaner module may include an upright connector formed by the plug module, and the second cleaner module may include a handheld connector that is formed by the socket module and is connected to the upright connector.

[0016] Further, the second cleaner module may further include a switch that causes power to be selectively applied to the socket module when the male coupler is coupled to the female coupler.

[0017] Further, the first cleaner module may include the male coupler for the extension frame, and the second cleaner module may include the female coupler. Further, the extension frame may include a cover that is provided at an upper end thereof and covers a part of a second body adjacent to the female coupler.

[0018] Also, the cover may include a guide rail that is formed on an inner surface thereof and guides entry of the second body, and the second body may include a guide groove that is provided at a portion adjacent to the female coupler and guides the guide rail. Further, the vacuum cleaner may further include a locking device that keeps the second cleaner module coupled to the first cleaner module.

[0019] Further, the locking device may include a locking member that is rotatably installed on the extension frame, an elastic member that elastically supports the locking member and causes the locking member to protrude from the extension frame when the locking member is rotated in a first direction, and a lever that is rotatably installed on the extension frame and enables a user to rotate the locking member in a second direction opposite to the first direction.

[0020] Further, the lever may include a lever section that receives a force from the user, and a first cam section that interacts with the locking member, and the locking member may include a locking section locked in a locking recess, and a second cam section that interacts with the first cam section by the rotation of the lever.

[0021] Further, the second dust collection unit may include a dust collecting case in which dust is collected, and at least one cyclone member that is disposed in the dust collecting case and guides air to flow in a spiral direction.

[0022] Further, the dust collecting case may include a partition that partitions an interior thereof into a first dust collecting section that is formed in an annular shape, and a second dust collecting section that is formed inside the first dust collecting section, and the at least one cyclone

member may include a first cyclone member that causes the foreign materials to be collected on the first dust collecting section, and a second cyclone member that is disposed inside the first cyclone member and causes the foreign materials to be collected on the second dust collecting section.

[0023] Further, the second dust collection unit may include a channel forming member that is installed at one open side of the dust collecting case and guides the air suctioned to the cyclone members and the air discharged from the cyclone members. The channel forming member may include a first cyclone channel that guides the air between the first cyclone member and the dust collecting case so as to be inclined to a circumferential inner side, and a discharge channel that guides discharge of the air passing through the second cyclone member. The first cyclone member may include communicating holes that allow the air to flow into a space between the first and second cyclone members, and the second cyclone member may include at least one second cyclone channel that guides the air inside the second cyclone member so as to be inclined to the circumferential inner side.

[0024] In addition, the at least one second cyclone channel may include multiple second cyclone channels disposed in a circumferential direction.

[0025] In accordance with another aspect of the present disclosure, a vacuum cleaner includes a first cleaner module for cleaning a floor, and a second cleaner module that is removably coupled to the first cleaner module. The first cleaner module includes a first body, and an extension frame that is connected to the first body and is installed such that the second cleaner module is separable therefrom. The second cleaner module includes a second body, and an extension pipe installed on the second body, and the second body includes a handle which is provided at one side thereof and is grasped by a user, and is available through the handle in an upright mode in a state in which the second cleaner module is installed on the extension frame.

[0026] As described above, the vacuum cleaner according to the embodiment of the present disclosure includes a first cleaner module having a first dust collection unit and a second cleaner module having a second dust collection unit. According to a cleaning mode, one of the first and second dust collection units is selectively operated, so that cleaning can be efficiently done.

[0027] Further, the vacuum cleaner according to the embodiment of the present disclosure can do cleaning in an upright mode by moving the first cleaner module using a handle provided for the second cleaner module in a state in which the second cleaner module is coupled to the first cleaner module.

[0028] According to an aspect of the present disclosure, there is provided a vacuum cleaner as set out in claim 1. Preferred features are set out in claims 2 to 14.

[0029] These and/or other aspects of the disclosure will become apparent and more readily appreciated from the following description of the embodiments, taken in

conjunction with the accompanying drawings of which:

FIG. 1 is a perspective view of a vacuum cleaner according to an embodiment of the present disclosure;

FIG. 2 is a front perspective view illustrating a state in which a first cleaner module and a second cleaner module are separated in the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 3 is a rear perspective view illustrating the state in which the first cleaner module and the second cleaner module are separated in the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 4 is a side view of the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 5 is a perspective view of a damper for opening/closing an internal channel of the second cleaner module in the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 6 is an enlarged view of a male coupler provided for an extension frame in the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 7 is an enlarged view of a female coupler provided for a second body in the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 8 is a perspective view of a locking device for locking the second cleaner module in the vacuum cleaner according to the embodiment of the present disclosure;

FIGS. 9 and 10 are schematic views illustrating an operation of the locking device for locking the second cleaner module in the vacuum cleaner according to the embodiment of the present disclosure;

FIG. 11 is a perspective view illustrating another example of the locking device for locking the second cleaner module in the vacuum cleaner according to the embodiment of the present disclosure;

FIGS. 12 and 13 are schematic views illustrating an operation of the other example of the locking device for locking the second cleaner module in the vacuum cleaner according to the embodiment of the present disclosure;

[0030] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

[0031] Hereinafter, a vacuum cleaner according to a first embodiment of the present disclosure will be described in detail with reference to the drawings.

[0032] As illustrated in FIGS. 1 to 4, a vacuum cleaner according to a first embodiment of the present disclosure includes a first cleaner module 1100 capable of cleaning a floor in an upright mode, and a second cleaner module 1200 that is removably installed on the first cleaner module 1100 and is capable of doing cleaning in a handy mode (handheld mode) after separation from the first

cleaner module 1100.

[0033] The first cleaner module 1100 includes a first body 1110 in which a first fan motor (not shown) for generating a suction force is housed; a head unit 1120 that is connected to a front side of the first body 1110, comes into contact with a floor to be cleaned, and suctions dust on the floor along with air; a first dust collection unit 1130 that separates the dust from the air suctioned through the head unit 1120 by the suction force generated from the first fan motor; a wheel assembly 1140 that is mounted on the first body 1110 and allows the first body 1110 to move along the floor to be cleaned; and an extension frame 1150 that extends upwardly from the first body 1110. The second cleaner module 1200 is removably installed on the extension frame 1150.

[0034] The first fan motor for generating the suction force is mounted in the first body 1110, and the first body 1110 can move along the floor through the wheel assembly 1140. Further, the first dust collection unit 1130 described above is mounted on an upper portion of the first body 1110.

[0035] The head unit 1120 is provided with a suction port (not shown) in a bottom thereof so as to receive the suction force generated from the first fan motor to suction the dust from the floor to be cleaned. The suction port (not shown) that receives the suction force to suction foreign materials along with air, and a brush (not shown) that is rotatably installed in the suction port so as to be able to easily clean, for instance, a carpet are disposed on the bottom of the head unit 1120.

[0036] The first dust collection unit 1130 receives the air suctioned by the head unit 1120, separates the dust included in the air, and collects the separated dust. In the present embodiment, the first dust collection unit 1130 separates and collects the dust from the air in a cyclone mode.

[0037] The wheel assembly 1140 includes a pair of wheels 1141 disposed on both left and right sides, and a wheel bracket 1142 on which the two wheels 1141 are rotatably installed and which rotatably supports the first body 1110.

[0038] The second cleaner module 1200 includes a second body 1210 in which a second fan motor (not shown) for generating a suction force is housed; an extension pipe 1220 that is provided at one side of the second body 1210 so as to enable a user to do cleaning in a separated state from a target to be cleaned; a second dust collection unit 1230 that separates the dust from the air suctioned through the extension pipe 1220 and collects the separated dust; and an extension cable 1240 and a plug 1250 which are used for connection to an external power supply (not shown). The second body 1210 includes a handle 1211 at one side thereof such that the user can grasp the handle to use the second cleaner module 1200.

[0039] The second fan motor for generating the suction force is mounted in the second body 1210. Based on the drawings, the aforementioned handle 1211 is provided

at an upper end of the second body 1210, and the aforementioned extension pipe 1220 is connected to a lower end of the second body 1210.

[0040] The extension pipe 1220 is removably installed on the second body 1210. The extension pipe 1220 is connected to the second body 1210 such that air can be suctioned through the extension pipe 1220, or the extension pipe 1220 is separated from the second body 1210 such that air can be directly suctioned to the second body 1210.

[0041] As illustrated in FIG. 5, a damper 1214 for preventing foreign materials from leaking through the extension pipe 1220 is disposed inside the second body 1210. The damper 1214 is disposed on a channel that connects the extension pipe 1220 and the second fan motor, and selectively opens/closes the channel according to an operation of the second fan motor. Further, the damper 1214 also serves to prevent the foreign materials from leaking through the extension pipe 1220 with the second cleaner module 1200 mounted on the extension frame 1150.

[0042] Such a damper 1214 includes a damper section 1214a that is formed of an elastically deformable material and opens/closes the channel. Thus, when the second fan motor is not used, the damper section 1214a is kept closing the channel connected to the extension pipe 1220. When the second fan motor is driven to generate the suction force, the damper section 1214a is elastically deformed to open the channel by the suction force generated from the second fan motor. Further, when the second fan motor is stopped to generate no suction force, the damper section 1214a is elastically restored again to close the channel.

[0043] Meanwhile, a rear face of the extension frame 1150 is provided with a seating recess 1150a on which the extension pipe 1220 is seated, and a lower portion of the extension frame 1150 is provided with a catching recess 1150b on which a leading end (a lower end of the extension pipe 1220 based on the drawings) of the extension pipe 1220 is caught and supported. Thus, in a state in which the second cleaner module 1200 is coupled to the extension frame 1150, the extension pipe 1220 is inserted into and supported in the seating recess 1150a and the catching recess 1150b. Thereby, the second cleaner module 1200 can be stably kept installed on the extension frame 1150 without arbitrary movement relative to the extension frame 1150. Further, in this way, the extension pipe 1220 is installed on the extension frame 1150 through the seating recess 1150a and the catching recess 1150b, so that an effect of reinforcing strength of the extension frame 1150 due to the extension pipe 1220 can be achieved.

[0044] When the vacuum cleaner does cleaning in an upright mode, the dust is collected through the first fan motor and the first dust collection unit 1130 included in the first cleaner module 1100. When cleaning is done in a handheld mode, the dust is collected through the second fan motor and the second dust collection unit 1230

included in the second cleaner module 1200.

[0045] Thus, the first fan motor and the first dust collection unit 1130 are designed to be able to suction a large quantity of air and to collect a large quantity of dust at the sacrifice of weight. The second fan motor and the second dust collection unit 1230 are designed to suction a relative small quantity of air, to collect a relative small quantity of dust, and to have a light weight. When used in the upright mode, the vacuum cleaner may be designed to have a relatively high suction performance. When used in the handheld mode in which the second cleaner module 1200 is separated from the first cleaner module 1100, the user can hold and use the second cleaner module 1200 with ease.

[0046] Further, as described above, since the second cleaner module 1200 is removably installed on the extension frame 1150, the user can displace the first cleaner module 1100 using the handle 1211 provided for the second cleaner module 1200. In other words, the handle 1211 provided for the second cleaner module 1200 is used when cleaning is done in the upright mode as well as when cleaning is done in the handheld mode.

[0047] Further, as illustrated in FIGS. 6 and 7, the extension frame 1150 has a protruding male coupler 1150c, and the second body 1210 has a recessed female coupler 1210a into which the male coupler 1150c is fitted, such that the second cleaner module 1200 is removably coupled to the first cleaner module 1100.

[0048] Further, as described above, the second cleaner module 1200 has the extension cable 1240 and the plug 1250. Since power is supplied to the second cleaner module 1200, the first cleaner module 1100 is supplied with the power via the second cleaner module 1200.

[0049] To this end, a plug module 1151 for electrical connection is disposed at the male coupler 1150c, and a socket module 1212 is disposed in the female coupler 1210a.

[0050] Further, the female coupler 1210a is provided with a switch 1213 such that the power is selectively applied to the socket module 1212 only when the male coupler 1150c is coupled to the female coupler 1210a. The switch 1213 is pressed by a tip of the male coupler 1150c, and is adapted to allow the power to be applied to the socket module 1212.

[0051] Thus, as the male coupler 1150c is inserted into the female coupler 1210a, the plug module 1151 is connected to the socket module 1212, and the power is applied to the socket module 1212 by the switch 1213. Thus, the first cleaner module 1100 can be supplied with the power from the second cleaner module 1200.

[0052] Further, an upper end of the extension frame 1150 is provided with a cover 1150d that is formed away from the male coupler 1150c and encloses a part of the second body 1210 adjacent to the female coupler 1210a when the male coupler 1150c is coupled to the female coupler 1210a. Here, a guide rail 1150e is formed on an inner surface of the cover 1150d so as to guide the second body 1210 entering along the cover, and a guide

groove 1210b is recessed in an outer surface of the second body 1210 adjacent to the female coupler 1210a, so that the second body 1210 can accurately enter along the cover 1150d. Thus, the plug module 1151 and the socket module 1212 can be accurately coupled and connected.

[0053] As described above, the plug module 1151 is coupled to the socket module 1212, the male coupler 1150c is fitted into the female coupler 1210a, and a part of the outer surface of the second body 1210 adjacent to the female coupler 1210a is coupled inside the cover 1150d. In other words, the second cleaner module 1200 is triply coupled to the extension frame 1150 of the first cleaner module 1100, and thus the second cleaner module 1200 can be stably kept installed on the extension frame 1150 of the first cleaner module 1100.

[0054] In the present embodiment, the plug module 1151 and the socket module 1212 are provided for the male coupler 1150c and the female coupler 1210a which are coupled with each other, but embodiments of the invention are not limited thereto. The plug module 1151 and the socket module 1212 may be provided to be opposite to each other at other positions. In detail, the plug module 1151 may be provided for the cover 1150d of the extension frame 1150, and the socket module 1212 may be provided outside the female coupler 1210a of the second body 1210 so as to be opposite to the plug module 1151. Further, the plug module 1151 may be provided for the extension frame 1150 so as to correspond to the leading end of the extension pipe 1220 mounted on the extension frame 1150, and the socket module 1212 may be provided for the leading end of the extension pipe 1220.

[0055] Further, in the present embodiment, the plug module 1151 is disposed at the male coupler 1150c, and the socket module 1212 is disposed at the female coupler 1210a. However, this is only an example. Conversely, the plug module may be disposed at the female coupler, and the socket module may be disposed at the male coupler in other embodiments.

[0056] Further, to allow the second cleaner module 1200 to be stably kept coupled to the extension frame 1150 of the first cleaner module 1100, a structure for locking the second cleaner module 1200 is installed on the extension frame 1150 as illustrated in FIGS. 8 and 9.

[0057] The locking structure includes a locking member 1152 that is rotatably installed on the extension frame 1150, an elastic member 1154 that elastically supports the locking member 1152 and causes one end of the locking member 1152 to protrude from the extension frame 1150 when the locking member 1152 is rotated in a first direction, and a lever 1153 that is rotatably installed on the extension frame 1150 and is rotated by a transmitted external force so as to rotate the locking member 1152 in a second direction opposite to the first direction.

[0058] The lever 1153 includes a lever section 1153a that receives a force from a user such that the lever 1153 can be rotated, and a pressing section 1153b that press-

es the locking member 1152 by the rotation of the lever 1153 such that the locking member is rotated in the second direction.

[0059] The locking member 1152 includes a locking section 1152a whose tip protrudes from the extension frame 1150 to be locked in a locking recess 1210c formed in the second cleaner module 1200, and an interlocking section 1152b that interacts with the pressing section 1153b by the rotation of the lever 1153 such that the locking member 1152 is rotated in the second direction.

[0060] Accordingly, as illustrated in FIG. 9, in the state in which the second cleaner module 1200 is installed on the first cleaner module 1100, the locking member 1152 is elastically supported in the first direction by an elastic restoration force of the elastic member 1154, and the tip of the locking section 1152a is kept locked in the locking recess 1210c. In this state, the user cannot separate the second cleaner module 1200 from the first cleaner module 1100.

[0061] Further, as illustrated in FIG. 10, when the user applies a force to the lever section 1153a to rotate the lever 1153, the pressing section 1153b of the lever 1153 interacts with the interlocking section 1152b of the locking member 1152 by the rotation of the lever 1153, and rotates the locking member 1152 in the second direction. The tip of the locking section 1152a is separated from the locking recess 1210c by the rotation of the locking member 1152. In this state, the user can separate the second cleaner module 1200 from the first cleaner module 1100.

[0062] In the present embodiment, the locking member 1152 is rotatably installed, and is locked or unlocked by the rotation, which shows an example. As illustrated in FIGS. 11-13, the locking structure may include a locking member 1152' that is movably installed on the extension frame 1150, an elastic member 1154' that elastically supports the locking member 1152' such that the locking member 1152' moves in a first direction, and a lever 1153' that is rotatably installed on the extension frame 1150, and is rotated by a transmitted external force such that the locking member 1152' moves in a second direction opposite to the first direction. As a user rotates the lever 1153', the locking member 1152' may be locked or unlocked while moving.

[0063] In the present embodiment, the switch is a three-phase switch, and is adapted to selectively supply power to any one of the first and second cleaner modules 1100 and 1200 depending on whether the second cleaner module 1200 is mounted or demounted, but embodiments of the invention are not limited thereto. The switch may be a two-phase switch, be adapted to selectively apply power to the second dust collection unit 1230 depending on whether or not the second cleaner module 1200 is separated. The power may be applied to the first cleaner module 1100 by a separate button (not shown) provided for the first cleaner module 1100.

[0064] In the present embodiment, the extension cable 1240 and the plug 1250 are connected to the second

cleaner module 1200 such that the first cleaner module 1100 is supplied with the power via the second cleaner module 1200, but embodiments of the invention are not limited thereto. The extension cable and the plug may be connected to the first cleaner module 1100, and the second cleaner module 1200 may have a rechargeable battery (not shown) housed therein.

[0065] In this case, the rechargeable battery housed in the second cleaner module 1200 is charged when the second cleaner module 1200 is coupled to the first cleaner module 1100. After the second cleaner module 1200 is separated from the first cleaner module 1100, the rechargeable battery supplies power to the second cleaner module 1200 such that the second cleaner module 1200 can be operated.

[0066] As discussed, embodiments can provide vacuum cleaner comprising: a first cleaner module arranged to clean a floor in an upright mode; and a second cleaner module that is removably coupled to the first cleaner module, wherein the second cleaner module is arranged to be separated from the first cleaner module so as to enable cleaning in a handheld mode, wherein the first cleaner module includes a first fan motor arranged to generate a suction force, and a first dust collection unit arranged to filter foreign materials from air suctioned by the first fan motor, and the second cleaner module includes a second fan motor arranged to generate a suction force when used in the handheld mode, and a second dust collection unit arranged to filter foreign materials from air suctioned by the second fan motor.

[0067] In some embodiments, the first fan motor is arranged to generate a suction force greater than that of the second fan motor. In some such embodiments, the first fan motor may be larger than the second fan motor.

[0068] In some embodiments, the first cleaner module includes a first body arranged to house the first fan motor, a head unit that is disposed at a front side of the first body and that is arranged to suction the air from the floor, and an extension frame connected to the first body; and the second cleaner module is removably coupled to the extension frame.

[0069] In some embodiments, one of the extension frame and second cleaner module includes a protruding male coupler, and the other includes a female coupler to which the male coupler is coupled. In some embodiments, one of the first and second cleaner modules includes a plug module, and the other includes a socket module to which the plug module is connected.

[0070] In some embodiments, the first cleaner module includes an upright connector formed by the plug module; and the second cleaner module includes a handheld connector that is formed by the socket module and is connected to the upright connector. In other embodiments, the first cleaner module includes an upright connector formed by the socket module; and the second cleaner module includes a handheld connector that is formed by the plug module and is connected to the upright connector.

[0071] In some embodiments, the second cleaner module further includes a switch that is arranged to cause power to be selectively applied to the socket module when the male coupler is coupled to the female coupler.

[0072] In some embodiments, the first cleaner module includes the male coupler on the extension frame; and the second cleaner module includes the female coupler. In other embodiments, the first cleaner module includes the female coupler on the extension frame; and the second cleaner module includes the male coupler.

[0073] Although a few embodiments of the present disclosure have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles of the invention, the scope of which is defined in the claims and their equivalents.

Claims

1. A vacuum cleaner comprising:

a first cleaner module (1100) arranged to clean a floor in an upright mode; and
 a second cleaner module (1200) that is removably coupled to the first cleaner module (1100), wherein the second cleaner module is arranged to be separated from the first cleaner module so as to enable cleaning in a handheld mode, wherein the first cleaner module (1100) includes a first fan motor arranged to generate a suction force, and a first dust collection unit (1130) arranged to filter foreign materials from air suctioned by the first fan motor, and the second cleaner module (1200) includes a second fan motor arranged to generate a suction force when used in the handheld mode, a second body (1210), an extension pipe (1220) installed on the second body (1210), and a second dust collection unit (1230) arranged to filter foreign materials from air suctioned by the second fan motor through the extension pipe (1220); wherein the first cleaner module (1100) includes a first body (1110) arranged to house the first fan motor, a head unit (1120) that is disposed at a front side of the first body (1110) and that is arranged to suction the air from the floor, an extension frame (1150) connected to the first body (1110), wherein a rear face of the extension frame (1150) is provided with a seating recess (1150a) in which the extension pipe (1220) is arranged to be seated, and a lower portion of the extension frame (1150) is provided with a catching recess (1150b) in which a leading end of the extension pipe (1220) is arranged to be caught and supported; and
 the second cleaner module (1200) is removably coupled to the extension frame (1150), wherein

in a state in which the second cleaner module (1200) is coupled to the extension frame (1150), the extension pipe (1220) is inserted into and supported in the seating recess (1150a) and the catching recess (1150b).

2. The vacuum cleaner according to claim 1, wherein the first fan motor is arranged to generate a suction force greater than that of the second fan motor.
3. The vacuum cleaner according to claim 1 or 2, wherein the second cleaner module (1200) includes a handle (1211) used for both cleaning in the upright mode and cleaning in the handheld mode.
4. The vacuum cleaner according to any one of claims 1 to 3, wherein one of the extension frame (1150) and the second cleaner module (1200) includes a protruding male coupler (1150c), and the other includes a female coupler (1210a) to which the male coupler (1150c) is coupled.
5. The vacuum cleaner according to claim 4, wherein one of the first (1100) and second (1200) cleaner modules includes a plug module (1151), and the other includes a socket module (1212) to which the plug module (1151) is connected.
6. The vacuum cleaner according to claim 5, wherein:
 - the first cleaner module (1100) includes an upright connector formed by the plug module (1151); and
 - the second cleaner module (1200) includes a handheld connector that is formed by the socket module (1212) and is connected to the upright connector.
7. The vacuum cleaner according to claim 5 or 6, wherein the second cleaner module (1200) further includes a switch (1213) that is arranged to cause power to be selectively applied to the socket module (1212) when the male coupler (1150c) is coupled to the female coupler (1210a).
8. The vacuum cleaner according to any one of claims 4 to 7, wherein:
 - the first cleaner module (1100) includes the male coupler (1150c) on the extension frame (1150); and
 - the second cleaner module (1200) includes the female coupler (1210a).
9. The vacuum cleaner according to claim 8, wherein the extension frame (1150) includes a cover (1150d) that is provided at an upper end thereof and that is arranged to cover a part of the second body (1210)

adjacent to the female coupler (1210a).

10. The vacuum cleaner according to claim 9, wherein:

the cover (1150d) includes a guide rail (11500) 5
that is formed on an inner surface thereof and
that is arranged to guide entry of the second
body (1210); and
the second body (1210) includes a guide groove 10
(1210b) that is provided at a portion adjacent to
the female coupler (1210a) and that is arranged
to guide the guide rail.

11. The vacuum cleaner according to any one of claims 1 to 10, further comprising a locking device that is 15
arranged to keep the second cleaner module (1200)
coupled to the first cleaner module (1100).

12. The vacuum cleaner according to claim 11, wherein 20
the locking device includes a locking member (1152)
that is rotatably installed on the extension frame
(1150), an elastic member (1154) that is arranged
to elastically support the locking member (1152) and
to cause the locking member (1152) to protrude from 25
the extension frame (1150) when the locking mem-
ber (1152) is rotated in a first direction, and a lever
(1153) that is rotatably installed on the extension
frame (1150) and that is arranged to enable a user
to rotate the locking member (1152) in a second di- 30
rection opposite to the first direction.

13. The vacuum cleaner according to claim 12, wherein:

the lever (1153) includes a lever section (1153a) 35
that is arranged to receive a force from the user,
and a first cam section that interacts with the
locking member (1152); and
the locking member (1152) includes a locking 40
section (1152a) locked in a locking recess
(1210c), and a second cam section that interacts
with the first cam section by the rotation of the
lever.

Patentansprüche

1. Staubsauger, der Folgendes umfasst:

ein erstes Saugermodule (1100), das so einge- 50
richtet ist, dass es in einer aufrechten Betriebs-
weise einen Fußboden reinigt, und
ein zweites Saugermodule (1200), das abnehm-
bar mit dem ersten Saugermodule (1100) gekop-
pelt ist, wobei das zweite Saugermodule so ein- 55
gerichtet ist, dass es sich von dem ersten Sau-
germodule trennen lässt und so ein Reinigen bei
in der Hand gehaltener Betriebsweise ermög-
licht,

wobei das erste Saugermodule (1100) Folgendes
aufweist: einen ersten Gebläsemotor, der so
eingerrichtet ist, dass er eine Saugkraft erzeugt,
und eine erste Staubsammereinheit (1130), die
so eingerrichtet ist, dass sie Fremdstoffe aus von
dem ersten Gebläsemotor angesaugter Luft he-
rausfiltert, und

wobei das zweite Saugermodule (1200) Folgen-
des aufweist: einen zweiten Gebläsemotor, der
so eingerrichtet ist, dass er eine Saugkraft er-
zeugt, wenn er in in der Hand gehaltener Be-
triebsweise benutzt wird, einen zweiten Haupt-
teil (1210), einen an dem zweiten Hauptteil
(1210) installierten Verlängerungsschlauch
(1220) und eine zweite Staubsammereinheit
(1230), die so eingerrichtet ist, dass sie Fremd-
stoffe aus von dem zweiten Gebläsemotor durch
den Verlängerungsschlauch (1220) angesaug-
ter Luft herausfiltert,

wobei das erste Saugermodule (1100) Folgendes
aufweist: einen ersten Hauptteil (1110), der so
eingerrichtet ist, dass er den ersten Gebläsemo-
tor aufnimmt, eine Kopfeinheit (1120), die an ei-
ner Vorderseite des ersten Hauptteils (1110) an-
geordnet und so eingerrichtet ist, dass sie die
Luft vom Fußboden ansaugt, einen Erweite-
rungsrahmen (1150), der mit dem ersten Haupt-
teil (1110) verbunden ist, wobei eine Rückseite
des Erweiterungsrahmens (1150) mit einer Be-
festigungsaussparung (1150a) versehen ist, in
der der Verlängerungsschlauch (1220) befestigt
wird, und ein unterer Abschnitt des Erweite-
rungsrahmens (1150) mit einer Aufnahmeaus-
sparung (1150b) versehen ist, in der ein vorde-
res Ende des Verlängerungsschlauchs (1220)
aufgenommen und gehalten wird, und
wobei das zweite Saugermodule (1200) abnehm-
bar mit dem Erweiterungsrahmen (1150) gekop-
pelt ist, wobei der Verlängerungsschlauch
(1220) in einem Zustand, in dem das zweite
Saugermodule (1200) mit dem Erweiterungsrah-
men (1150) gekoppelt ist, in die Befestigungs-
aussparung (1150a) und die Aufnahmeauspa-
rung (1150b) eingeführt ist und in ihnen gehalten
wird.

2. Staubsauger nach Anspruch 1, wobei der erste Ge-
bläsemotor so eingerrichtet ist, dass er eine Saug-
kraft erzeugt, die größer ist als die des zweiten Ge-
bläsemotors.

3. Staubsauger nach Anspruch 1 oder 2, wobei das
zweite Saugermodule (1200) einen Griff (1211) auf-
weist, der sowohl zum Reinigen in der aufrechten
Betriebsweise als auch zum Reinigen in in der Hand
gehaltener Betriebsweise benutzt wird.

4. Staubsauger nach einem der Ansprüche 1 bis 3, wo-

bei der Erweiterungsrahmen (1150) oder das zweite Saugermodule (1200) ein vorstehendes Steckelement (1150c) und das jeweils andere Teil ein Buchsenelement (1210a) aufweist, mit dem das Steckelement (1150c) gekoppelt ist.

5. Staubsauger nach Anspruch 4, wobei das erste (1100) oder das zweite (1200) Saugermodule ein Steckermodule (1151) und das jeweils andere Teil ein Steckbuchsenmodule (1212) aufweist, mit dem das Steckermodule (1151) verbunden ist.

6. Staubsauger nach Anspruch 5, wobei:

das erste Saugermodule (1100) ein von dem Steckermodule (1151) gebildetes Aufrechtmodus-Verbindungsstück aufweist und
das zweite Saugermodule (1200) ein von dem Steckbuchsenmodule (1212) gebildetes Handmodus-Verbindungsstück aufweist, das mit dem Aufrechtmodus-Verbindungsstück verbunden ist.

7. Staubsauger nach Anspruch 5 oder 6, wobei das zweite Saugermodule (1200) ferner einen Schalter (1213) aufweist, der so eingerichtet ist, dass er bewirkt, dass das Steckbuchsenmodule (1212) gezielt mit Strom versorgt wird, wenn das Steckelement (1150c) mit dem Buchsenelement (1210a) gekoppelt ist.

8. Staubsauger nach einem der Ansprüche 4 bis 7, wobei:

das erste Saugermodule (1100) das Steckelement (1150c) an dem Erweiterungsrahmen (1150) aufweist und
das zweite Saugermodule (1200) das Buchsenelement (1210a) aufweist.

9. Staubsauger nach Anspruch 8, wobei der Erweiterungsrahmen (1150) eine Abdeckung (1150d) aufweist, die an einem oberen Ende davon vorgesehen und so eingerichtet ist, dass sie einen an das Buchsenelement (1210a) angrenzenden Teil des zweiten Hauptteils (1210) abdeckt.

10. Staubsauger nach Anspruch 9, wobei:

die Abdeckung (1150d) eine Führungsschiene (1150e) aufweist, die an einer Innenfläche davon gebildet und so eingerichtet ist, dass sie ein Einführen des zweiten Hauptteils (1210) führt, und
der zweite Hauptteil (1210) eine Führungsnut (1210b) aufweist, die an einem an das Buchsenelement (1210a) angrenzenden Abschnitt vorgesehen und so eingerichtet ist, dass sie die

Führungsschiene führt.

11. Staubsauger nach einem der Ansprüche 1 bis 10, der ferner eine Verriegelungsvorrichtung umfasst, die so eingerichtet ist, dass sie das zweite Saugermodule (1200) mit dem ersten Saugermodule (1100) gekoppelt hält.

12. Staubsauger nach Anspruch 11, wobei die Verriegelungsvorrichtung Folgendes aufweist: ein Verriegelungselement (1152), das drehbar an dem Erweiterungsrahmen (1150) installiert ist, ein federndes Element (1154), das so eingerichtet ist, dass es das Verriegelungselement (1152) federnd hält und bewirkt, dass das Verriegelungselement (1152) von dem Erweiterungsrahmen (1150) vorsteht, wenn es in eine erste Richtung gedreht ist, und einen Hebel (1153), der drehbar an dem Erweiterungsrahmen (1150) installiert und so eingerichtet ist, dass er es einem Benutzer ermöglicht, das Verriegelungselement (1152) in einer zweiten Richtung zu drehen, die der ersten Richtung entgegengesetzt ist.

13. Staubsauger nach Anspruch 12, wobei:

der Hebel (1153) ein Hebelstück (1153a), das so eingerichtet ist, dass es eine Kraft von dem Benutzer aufnimmt, und ein erstes Nockenstück aufweist, das mit dem Verriegelungselement (1152) zusammenwirkt, und
das Verriegelungselement (1152) ein Verriegelungsstück (1152a), das in einer Verriegelungsaussparung (1210c) verriegelt ist, und ein zweites Nockenstück aufweist, das durch das Drehen des Hebels mit dem ersten Nockenstück zusammenwirkt.

Revendications

1. Aspirateur comprenant :

un premier module nettoyeur (1100) conçu pour nettoyer un sol en mode vertical ; et
un second module nettoyeur (1200) accouplé amovible au premier module nettoyeur (1100), le second module nettoyeur étant conçu pour être séparé du premier module nettoyeur de manière à permettre un nettoyage en mode portatif, le premier module nettoyeur (1100) comprenant un premier moteur de ventilateur conçu pour générer une force d'aspiration et une première unité de collecte de poussière (1130) conçue pour filtrer des corps étrangers de l'air aspiré par le premier moteur de ventilateur, et
le second module nettoyeur (1200) comprenant un second moteur de ventilateur conçu pour générer une force d'aspiration en cas d'utilisation

- en mode portatif, un second corps (1210), un tuyau d'extension (1220) installé sur le second corps (1210) et une seconde unité de collecte de poussière (1230) conçue pour filtrer des corps étrangers de l'air aspiré par le second moteur de ventilateur par le tuyau d'extension (1220) ;
- le premier module nettoyeur (1100) comprenant un premier corps (1110) conçu pour abriter le premier moteur de ventilateur, une unité tête (1120) qui est disposée au niveau d'un côté avant du premier corps (1110) et qui est conçue pour aspirer l'air du sol, une structure d'extension (1150) connectée au premier corps (1110), une face arrière de la structure d'extension (1150) étant munie d'un évidement de logement (1150a) dans lequel le tuyau d'extension (1220) est conçu pour être logé, et une partie inférieure de la structure d'extension (1150) étant munie d'un évidement de capture (1150b) dans lequel une extrémité avant du tuyau d'extension (1220) est conçue pour être capturée et supportée ; et le second module nettoyeur (1200) étant accouplé amovible à la structure d'extension (1150), et dans un état dans lequel le second module nettoyeur (1200) est accouplé à la structure d'extension (1150), le tuyau d'extension (1220) étant inséré dans l'évidement de logement (1150a) et dans l'évidement de capture (1150b) et supporté par ceux-ci.
2. Aspirateur selon la revendication 1, dans lequel le premier moteur de ventilateur est conçu pour générer une force d'aspiration supérieure à celle du second moteur de ventilateur.
 3. Aspirateur selon la revendication 1 ou 2, dans lequel le second module nettoyeur (1200) comprend une poignée (1211) utilisée pour nettoyer en mode vertical et pour nettoyer en mode portatif.
 4. Aspirateur selon l'une quelconque des revendications 1 à 3, dans lequel un élément parmi la structure d'extension (1150) et le second module nettoyeur (1200) comprend un coupleur mâle en saillie (1150c), et l'autre élément comprend un coupleur femelle (1210a) auquel le coupleur mâle (1150c) est accouplé.
 5. Aspirateur selon la revendication 4, dans lequel un des premier (1100) et second (1200) modules nettoyeurs comprend un module fiche (1151) et l'autre comprend un module prise (1212) auquel le module fiche (1151) est connecté.
 6. Aspirateur selon la revendication 5, dans lequel :

le premier module nettoyeur (1100) comprend

un connecteur vertical formé par le module fiche (1151) ; et

le second module nettoyeur (1200) comprend un connecteur portatif qui est formé par le module prise (1212) et qui est connecté au connecteur vertical.
 7. Aspirateur selon la revendication 5 ou 6, dans lequel le second module nettoyeur (1200) comprend en outre un interrupteur (1213) qui est conçu pour provoquer l'application sélective d'énergie au module prise (1212) quand le coupleur mâle (1150c) est accouplé au coupleur femelle (1210a).
 8. Aspirateur selon l'une quelconque des revendications 4 à 7, dans lequel :

le premier module nettoyeur (1100) comprend le coupleur mâle (1150c) sur la structure d'extension (1150) ; et

le second module nettoyeur (1200) comprend le coupleur femelle (1210a).
 9. Aspirateur selon la revendication 8, dans lequel la structure d'extension (1150) comprend un couvercle (1150d) qui est situé au niveau d'une extrémité supérieure correspondante et qui est conçu pour couvrir une partie du second corps (1210) adjacente au coupleur femelle (1210a).
 10. Aspirateur selon la revendication 9, dans lequel :

le couvercle (1150d) comprend un rail de guidage (1150e) qui est formé sur une surface intérieure correspondante et qui est conçu pour guider l'entrée du second corps (1210) ; et

le second corps (1210) comprend une rainure de guidage (1210b) qui est située au niveau d'une partie adjacente au coupleur femelle (1210a) et qui est conçue pour guider le rail de guidage.
 11. Aspirateur selon l'une quelconque des revendications 1 à 10, comprenant en outre un dispositif de verrouillage qui est conçu pour maintenir le second module nettoyeur (1200) accouplé au premier module nettoyeur (1100).
 12. Aspirateur selon la revendication 11, dans lequel le dispositif de verrouillage comprend un élément de verrouillage (1152) qui est installé rotatif sur la structure d'extension (1150), un élément élastique (1154) qui est conçu pour supporter élastiquement l'élément de verrouillage (1152) et pour faire en sorte que l'élément de verrouillage (1152) fasse saillie par rapport à la structure d'extension (1150) quand l'élément de verrouillage (1152) est tourné dans une première direction, et un levier (1153) qui est installé

rotatif sur la structure d'extension (1150) et qui est conçu pour permettre à un utilisateur de tourner l'élément de verrouillage (1152) dans une seconde direction opposée à la première direction.

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13. Aspirateur selon la revendication 12, dans lequel :

le levier (1153) comprend une section levier (1153a) qui est conçue pour recevoir une force de l'utilisateur et une première section came qui interagit avec l'élément de verrouillage (1152) ;
et

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l'élément de verrouillage (1152) comprend une section de verrouillage (1152a) verrouillée dans un évidement de verrouillage (1210c) et une seconde section came qui interagit avec la première section came par la rotation du levier.

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FIG. 1

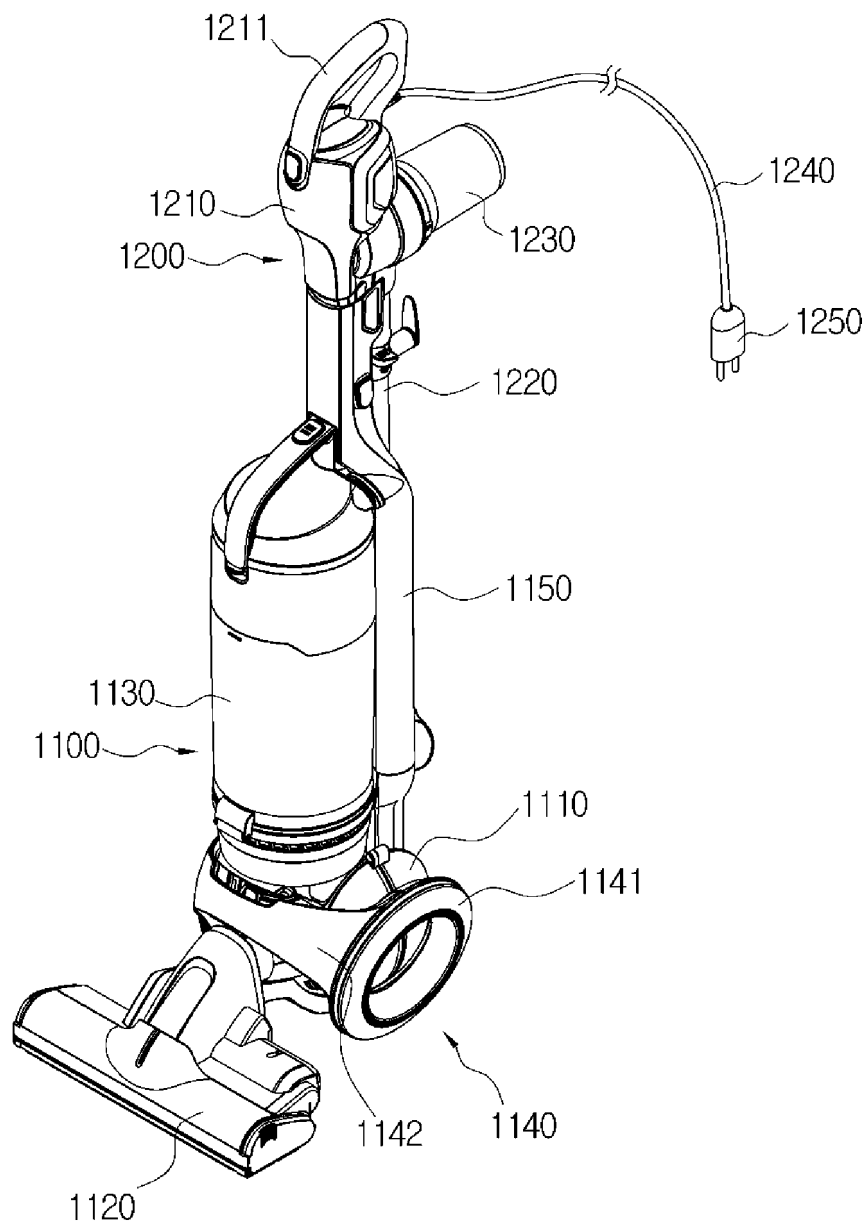


FIG. 2

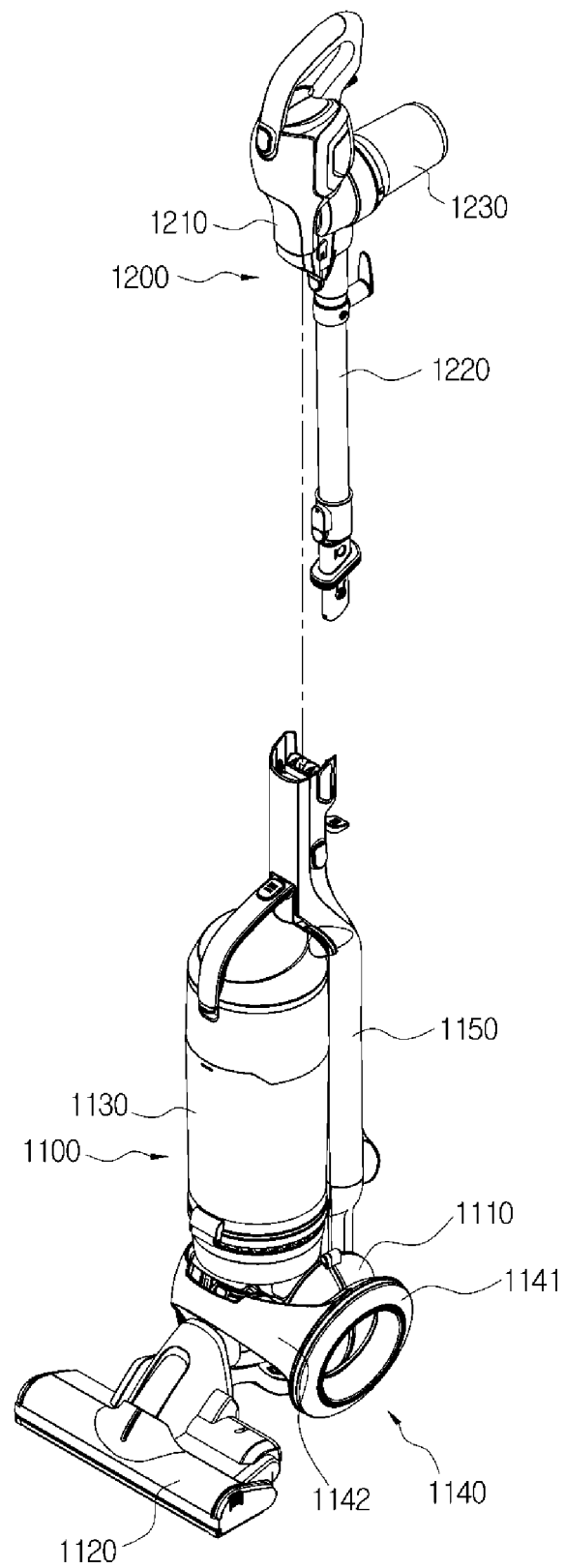


FIG. 3

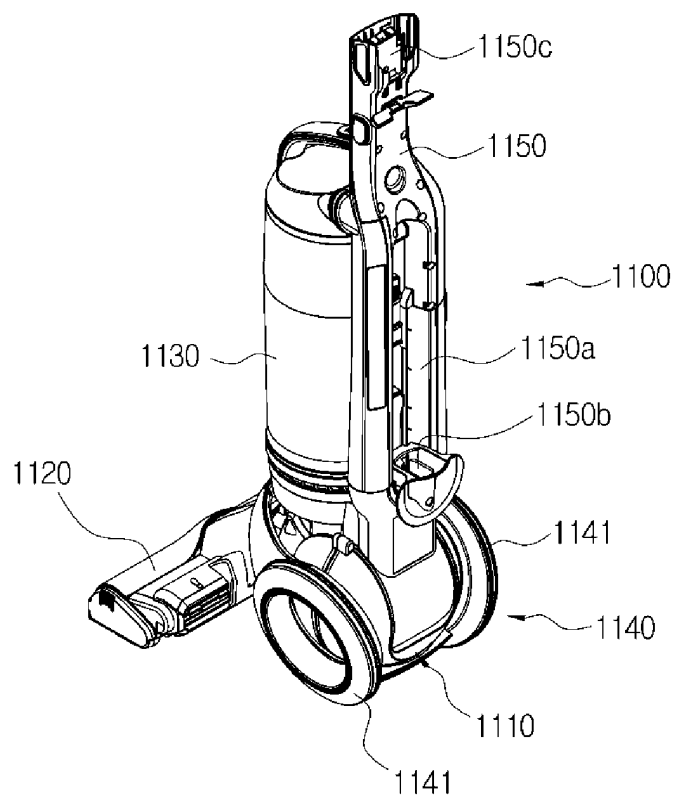
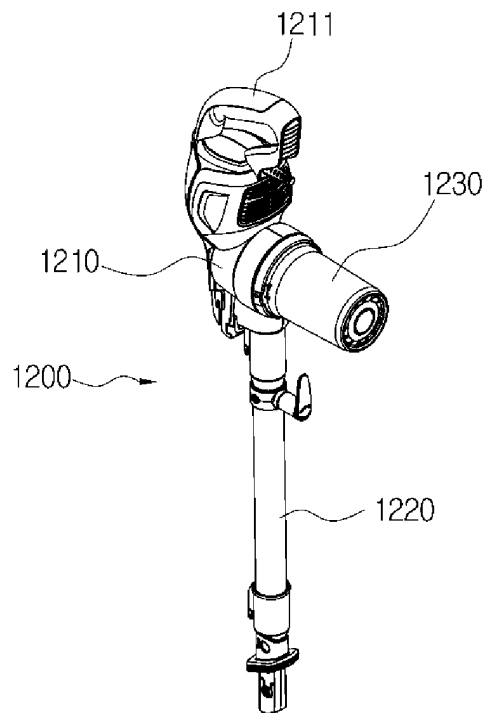


FIG. 4

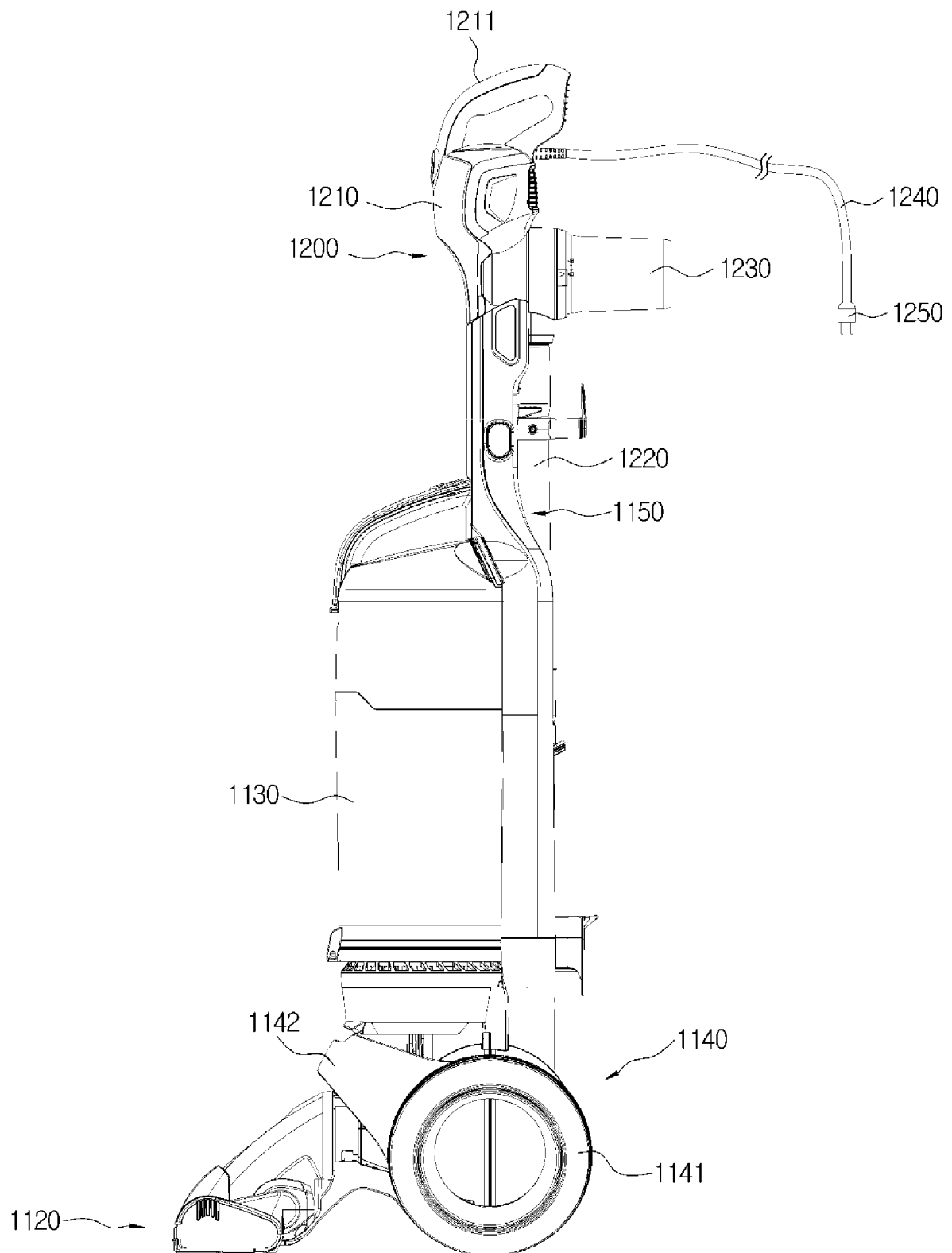


FIG. 5

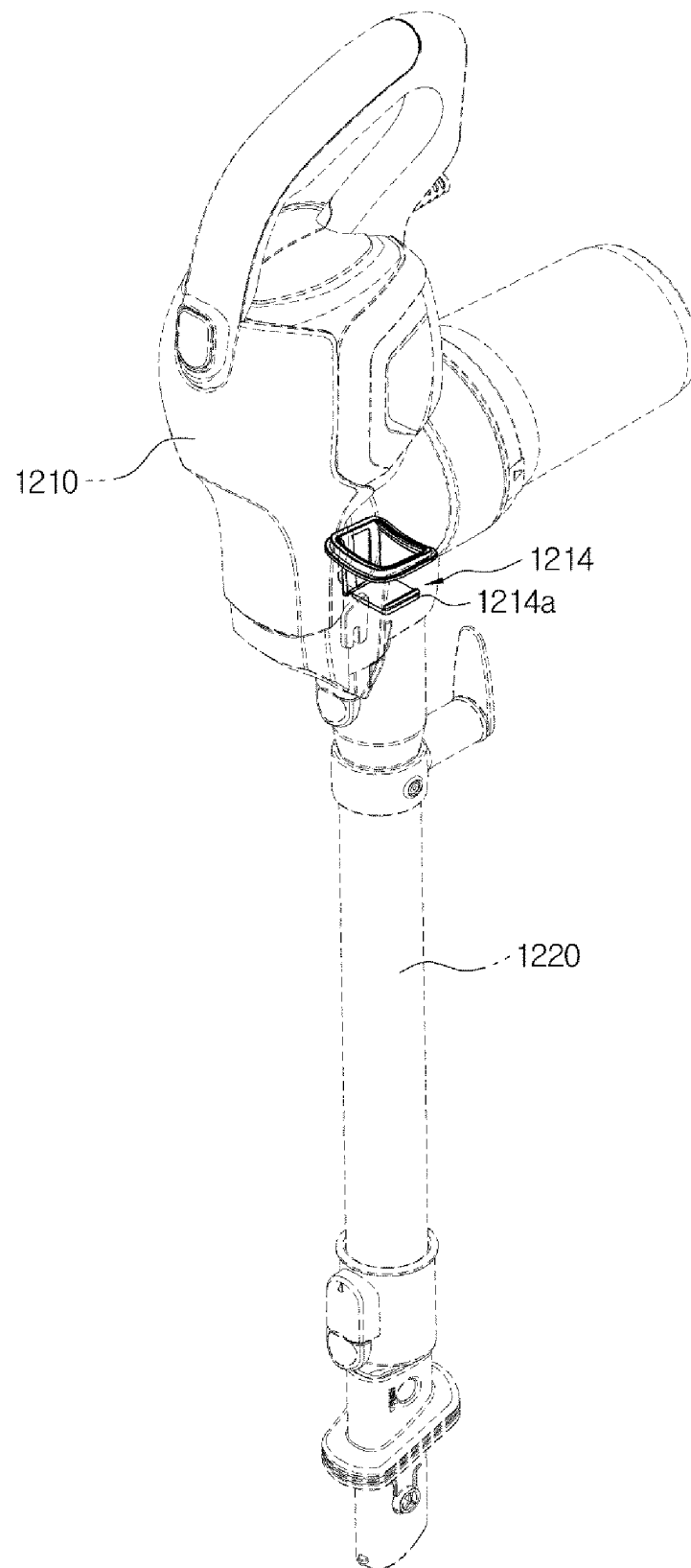


FIG. 6

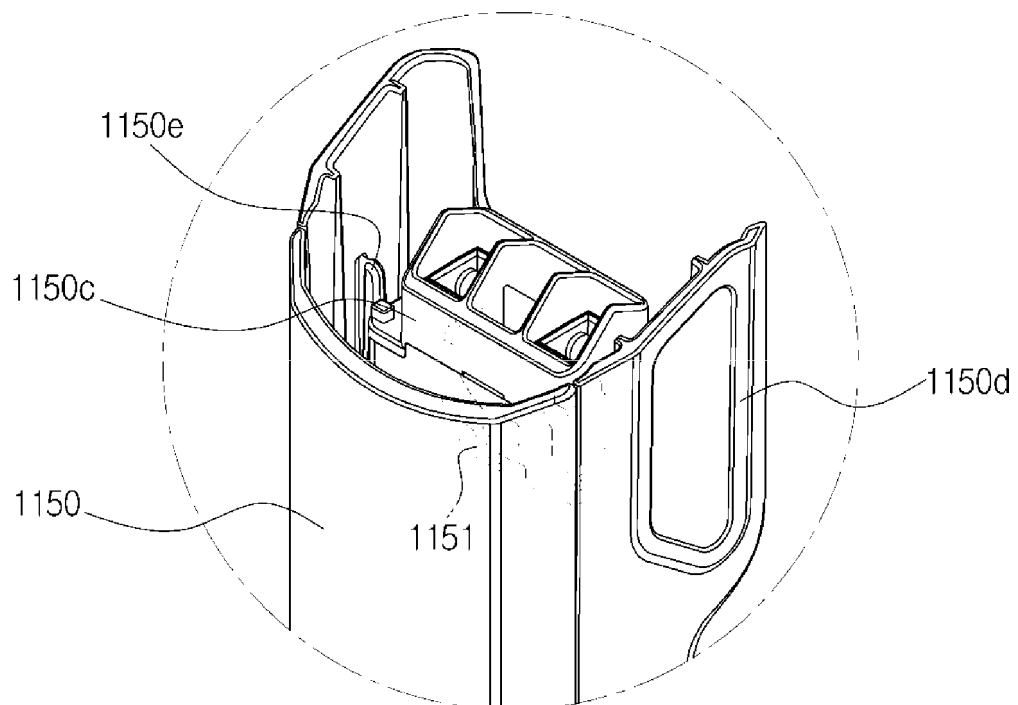


FIG. 7

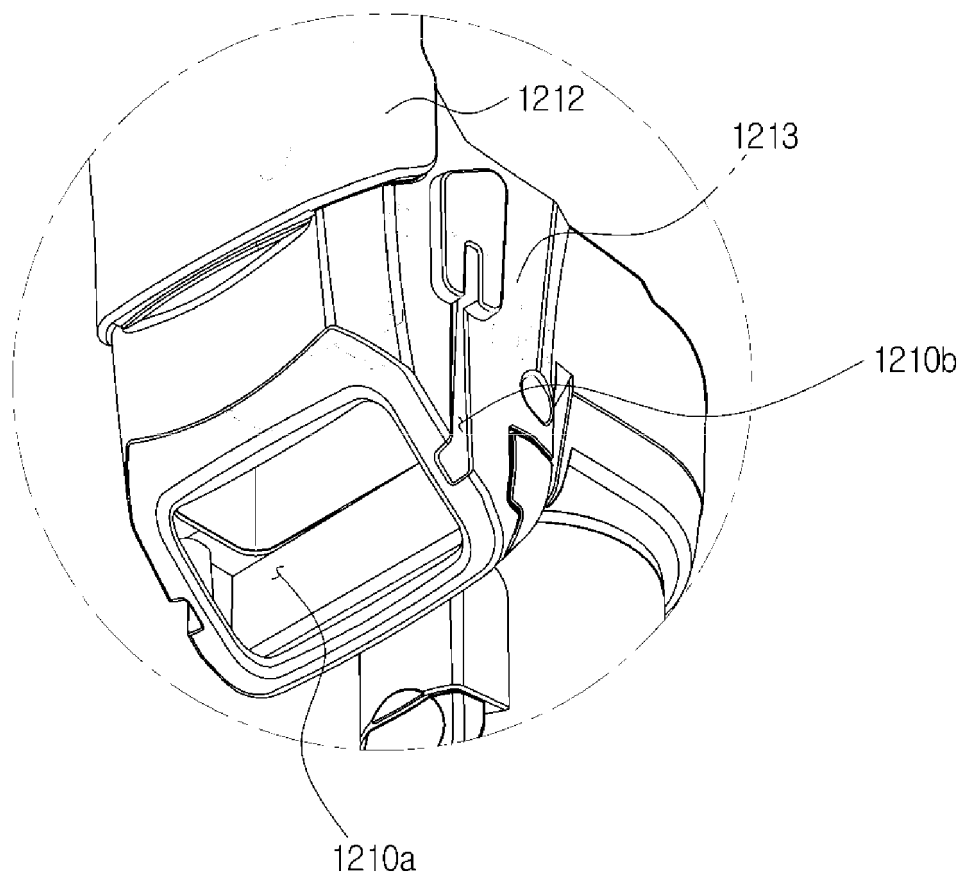


FIG. 8

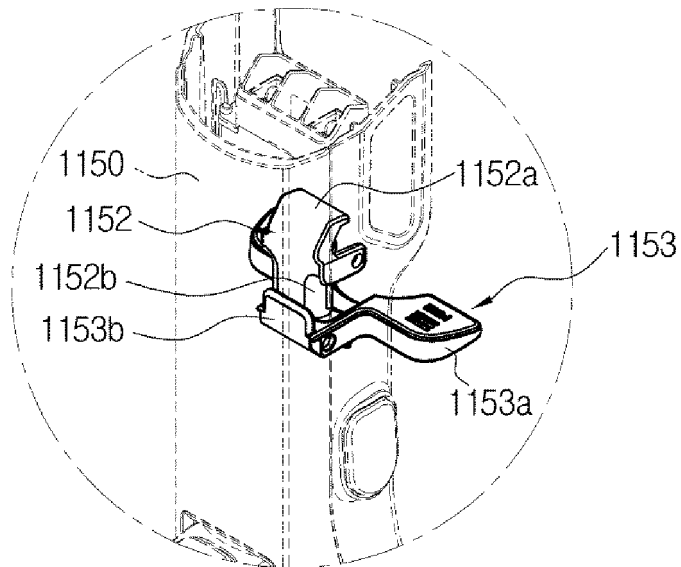


FIG. 9

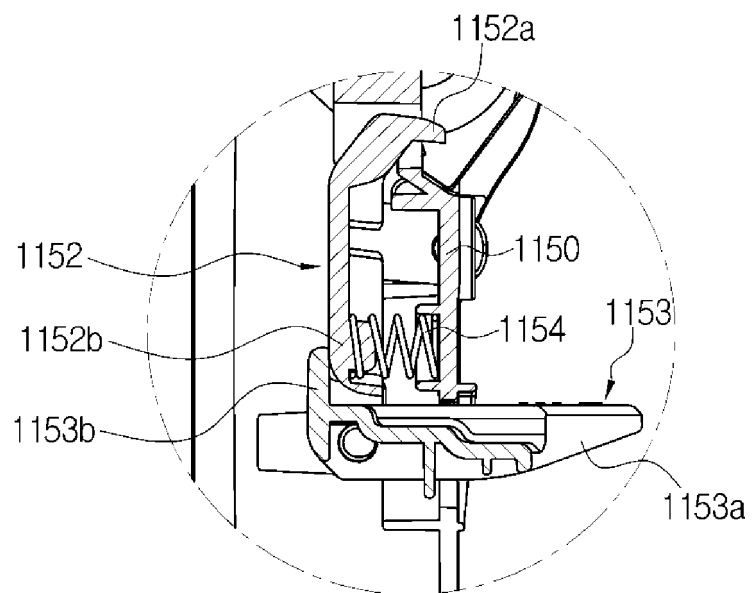


FIG. 10

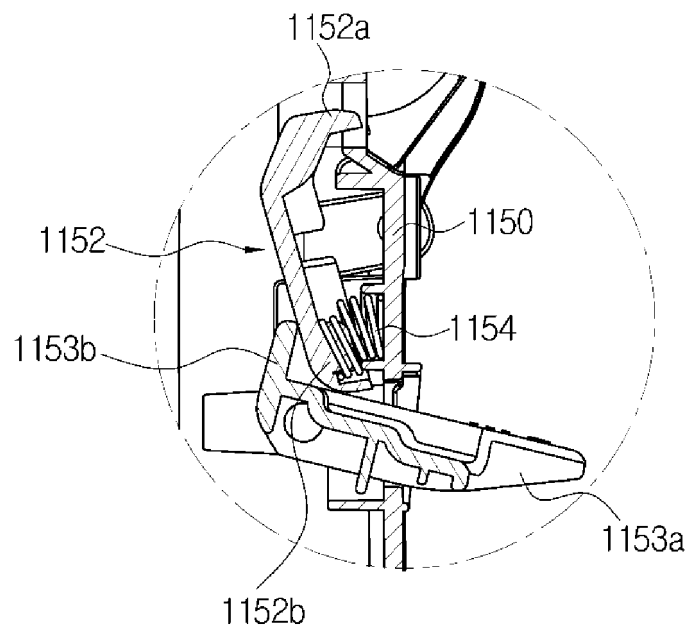


FIG. 11

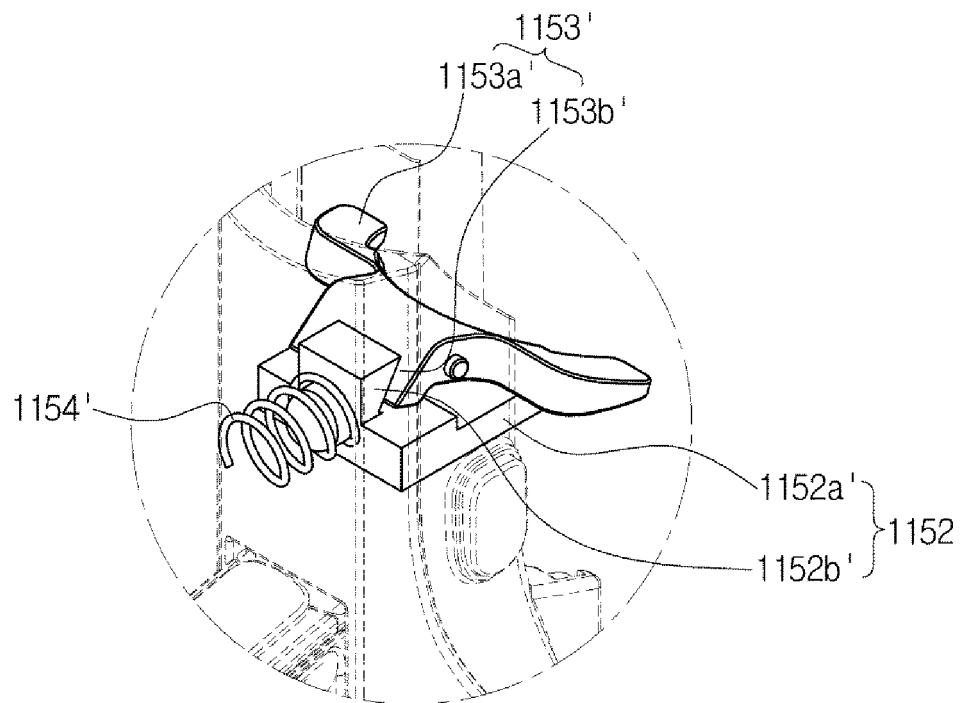


FIG. 12

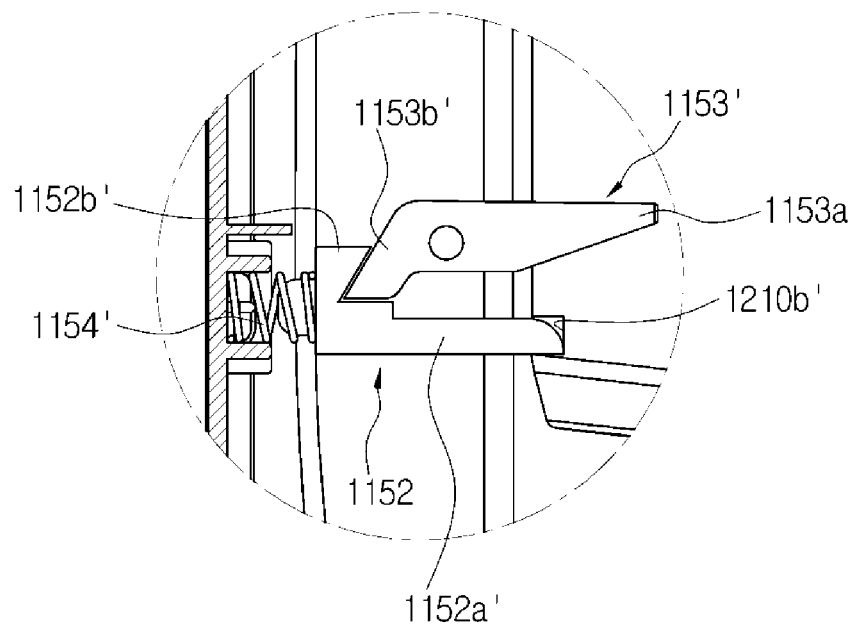
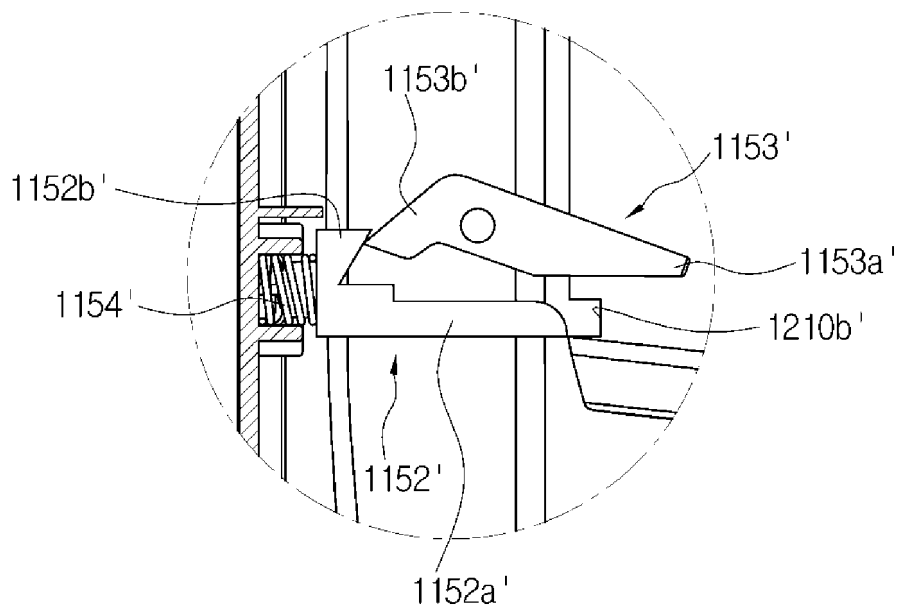


FIG. 13



REFERENCES CITED IN THE DESCRIPTION

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