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(54) **REMOTE CONTROL SWEEPER**

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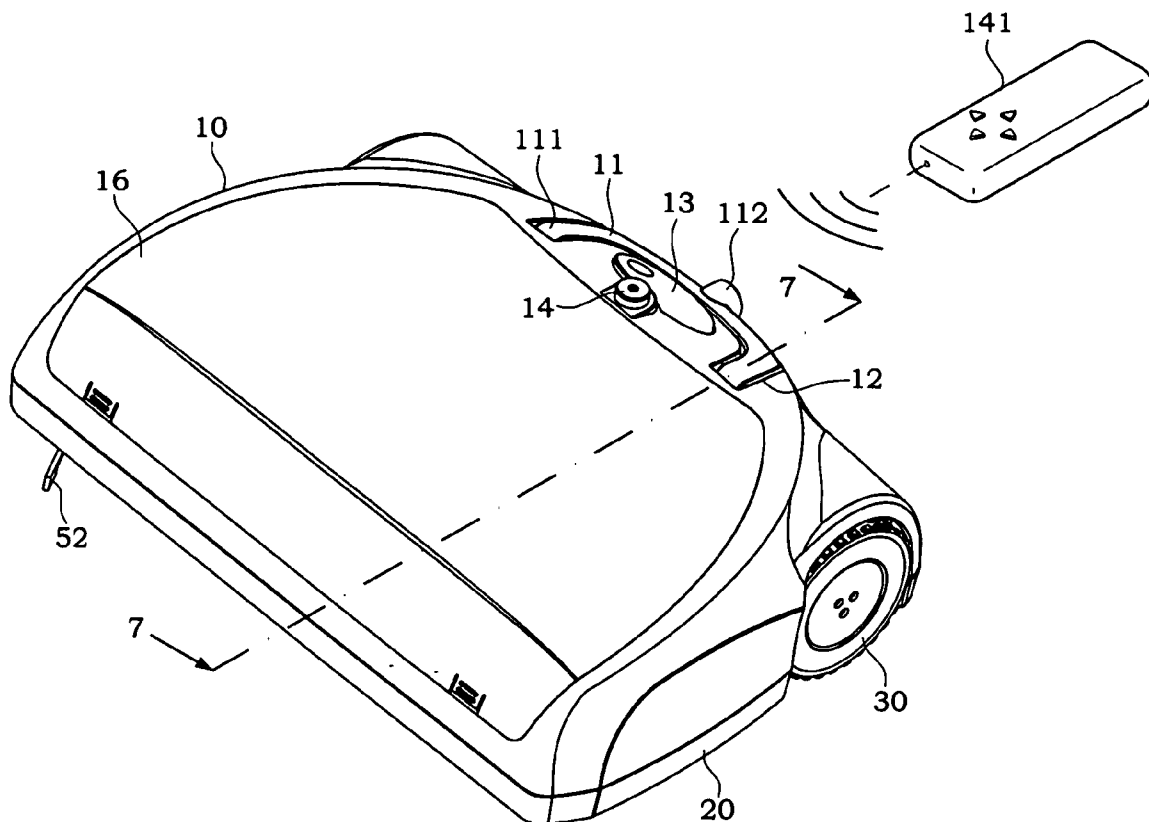
(57) **ABSTRACT**

A remote control sweeper includes a wireless remote control receiver installed at the sweeper; a remote control for transmitting a direction control signal to the remote control receiver via a wireless transmission to control the moving direction of the sweeper, such that the sweeper can be moved to automatically clean up the dirt and collect the dust on a floor.

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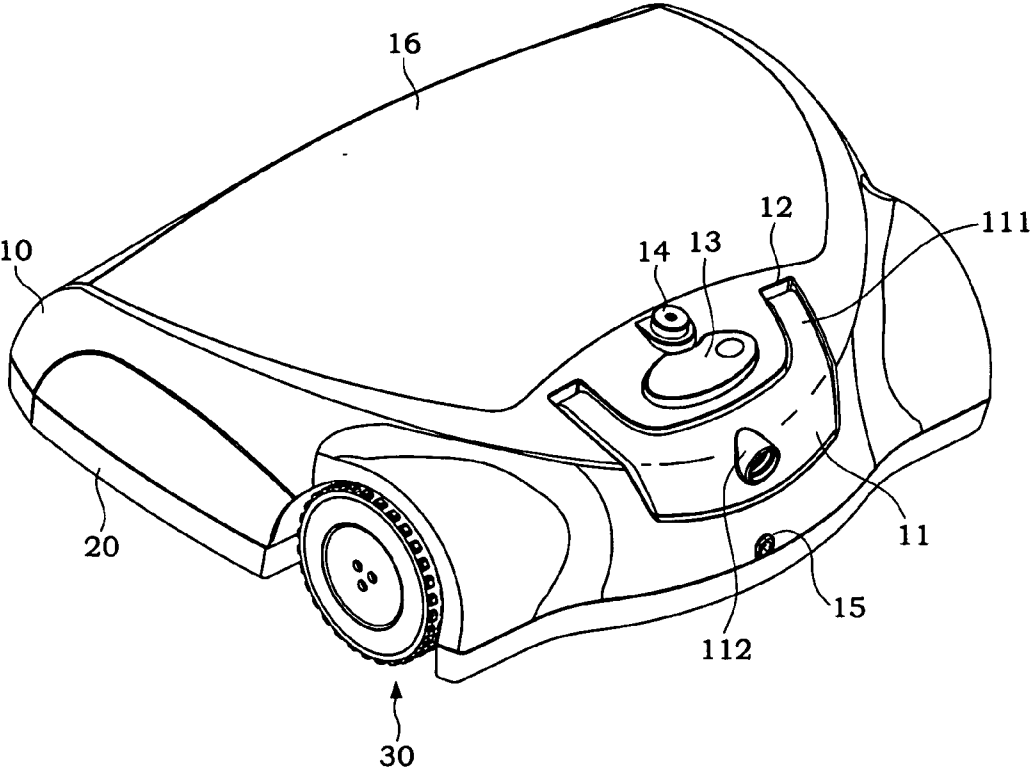


FIG. 1

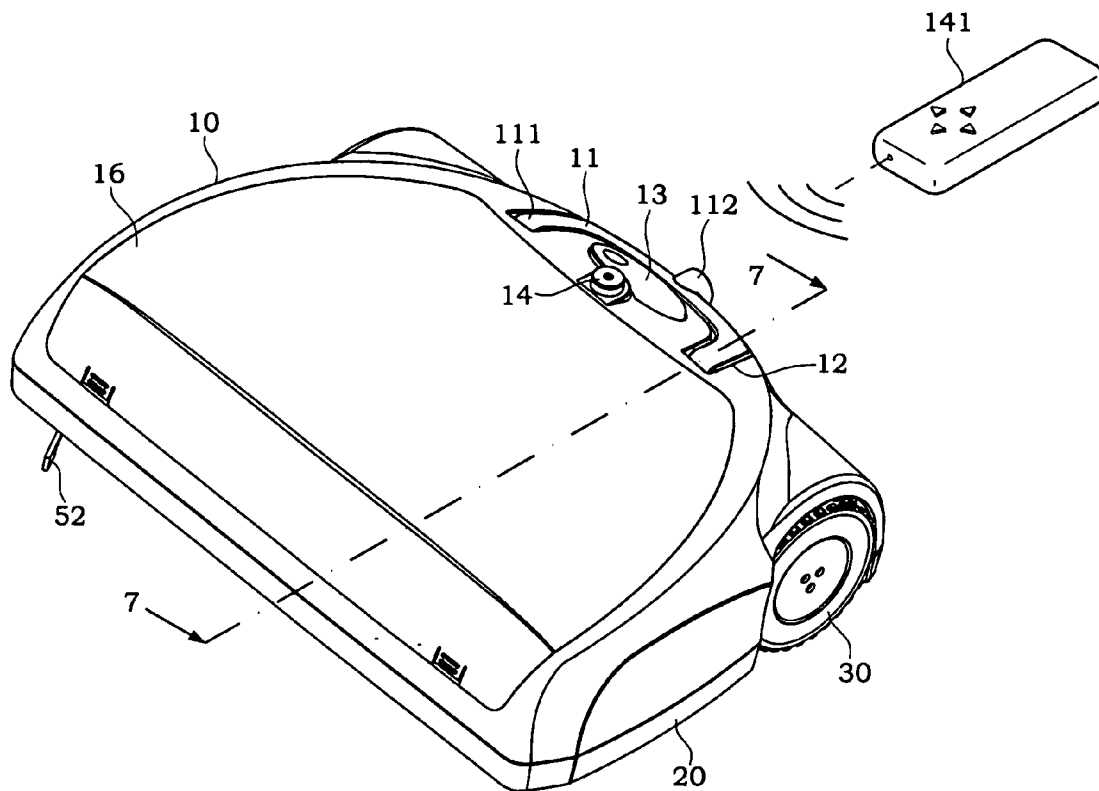


FIG. 2

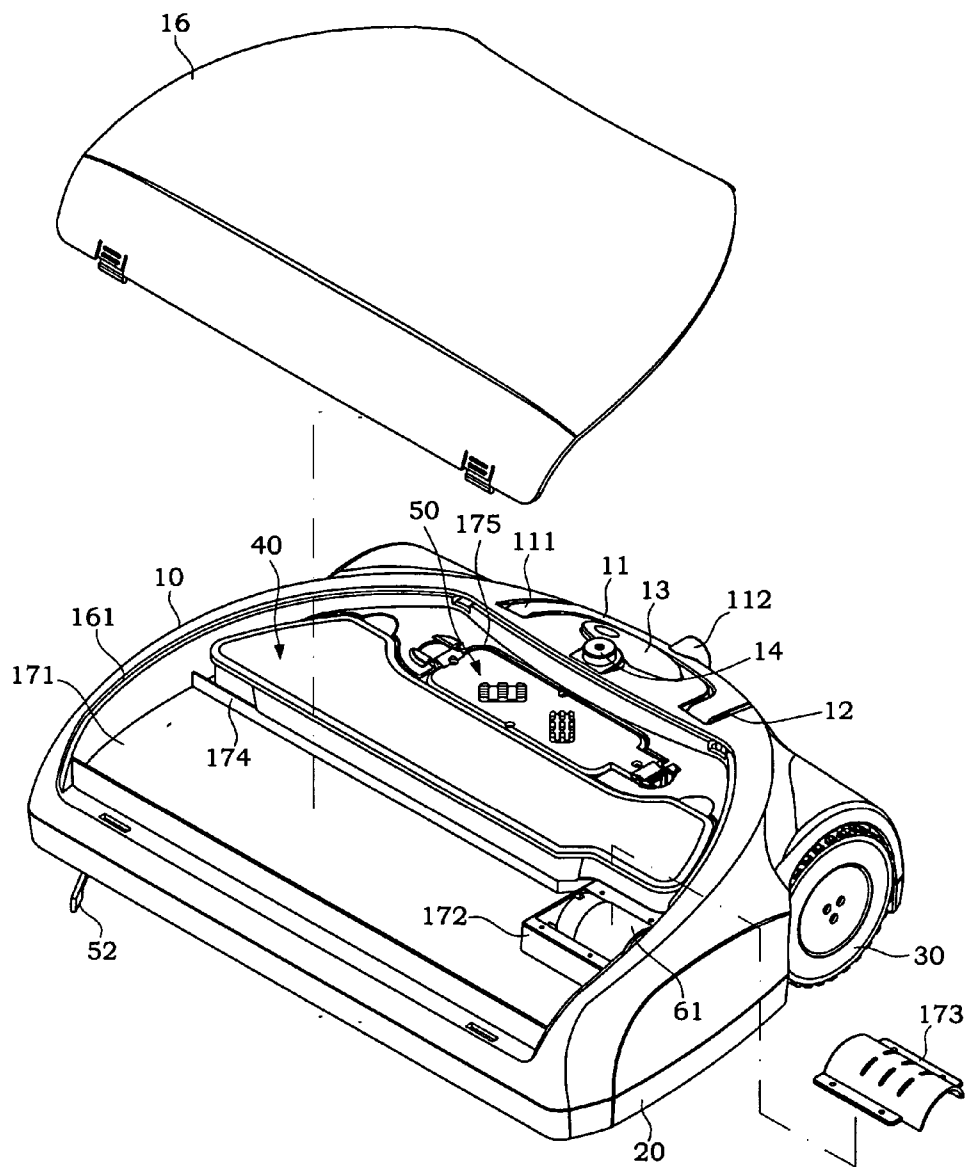


FIG.3

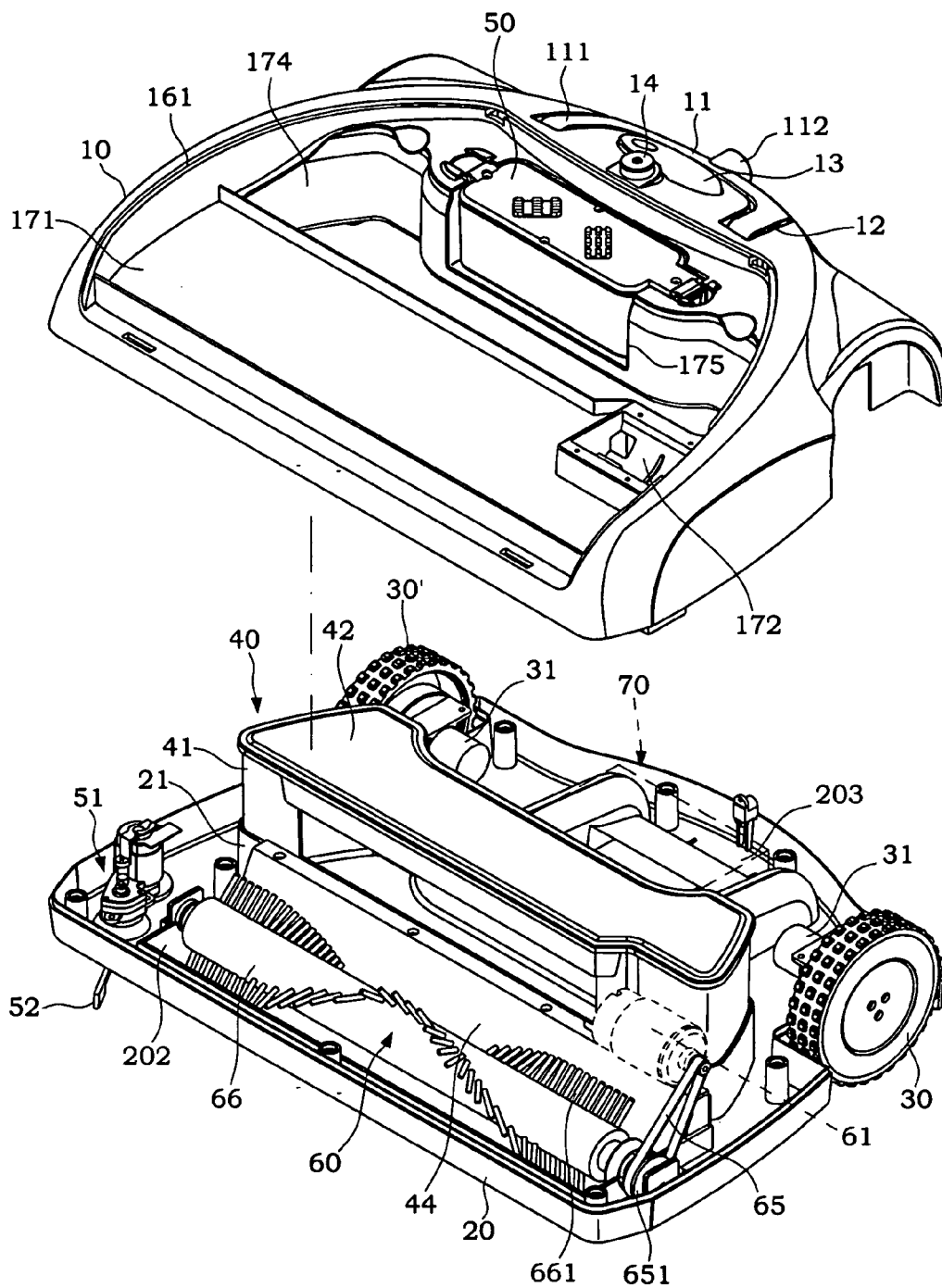


FIG. 4

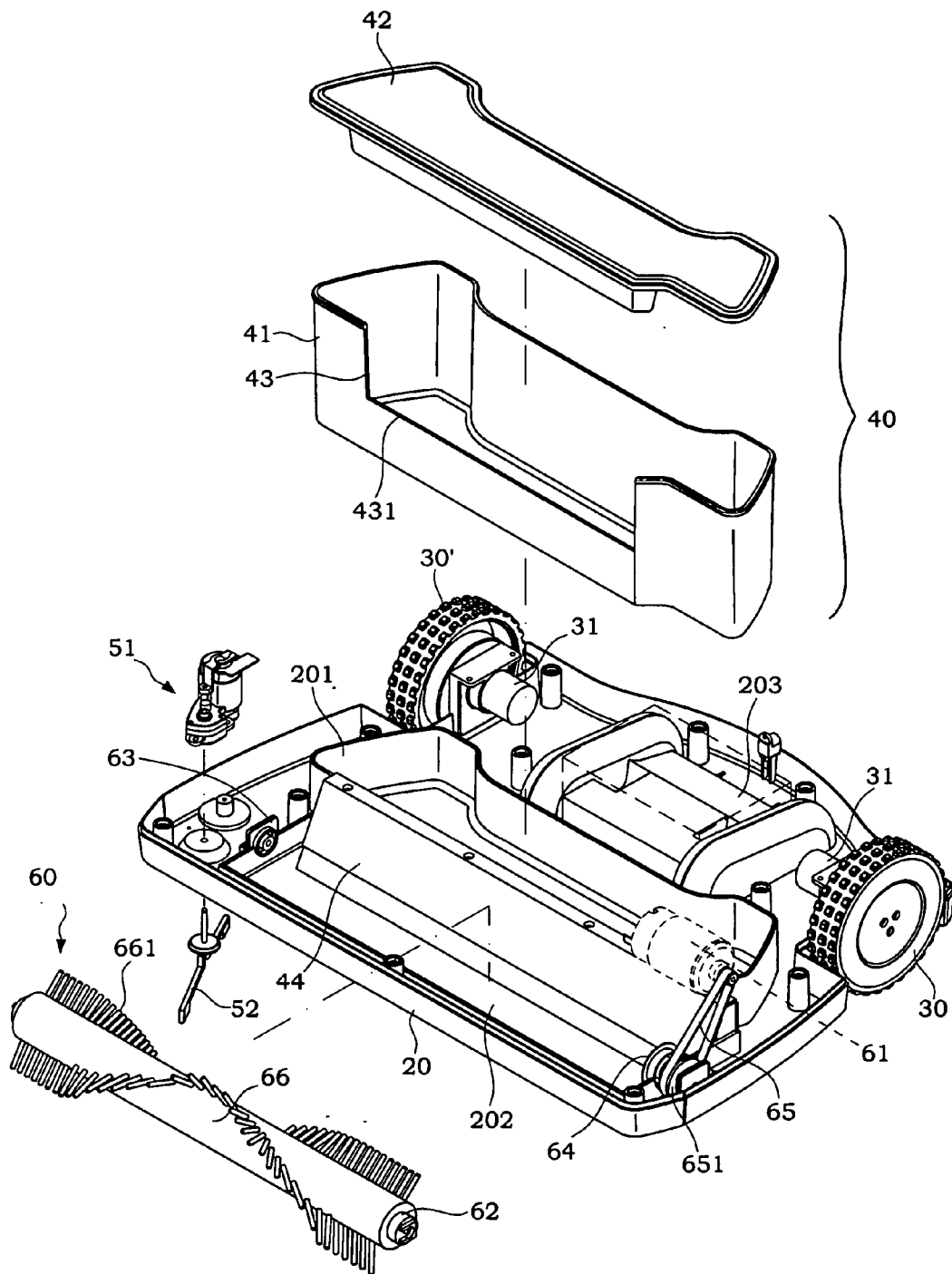


FIG. 5

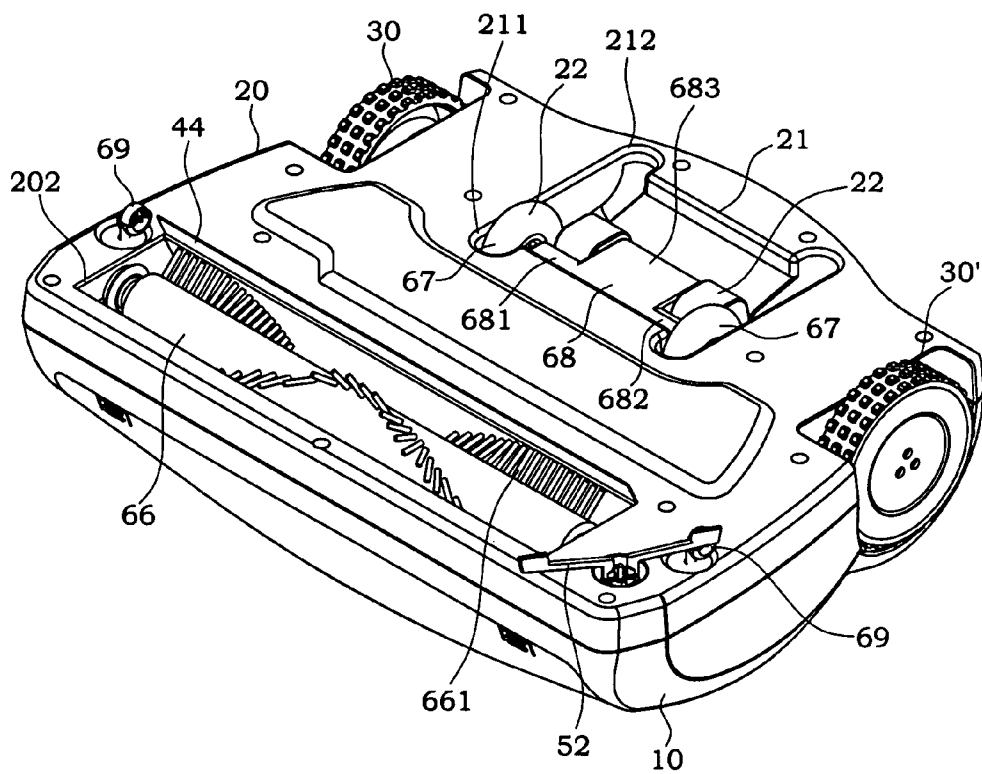


FIG. 6

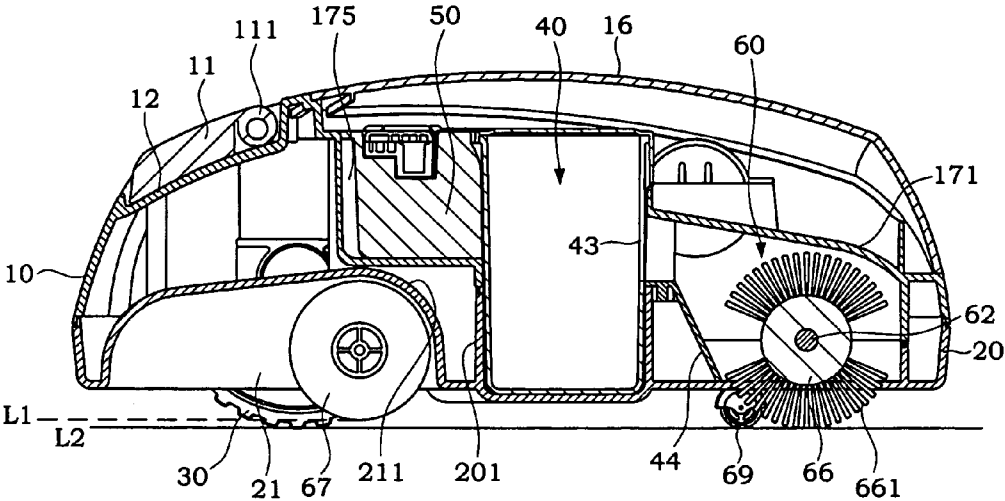


FIG. 7

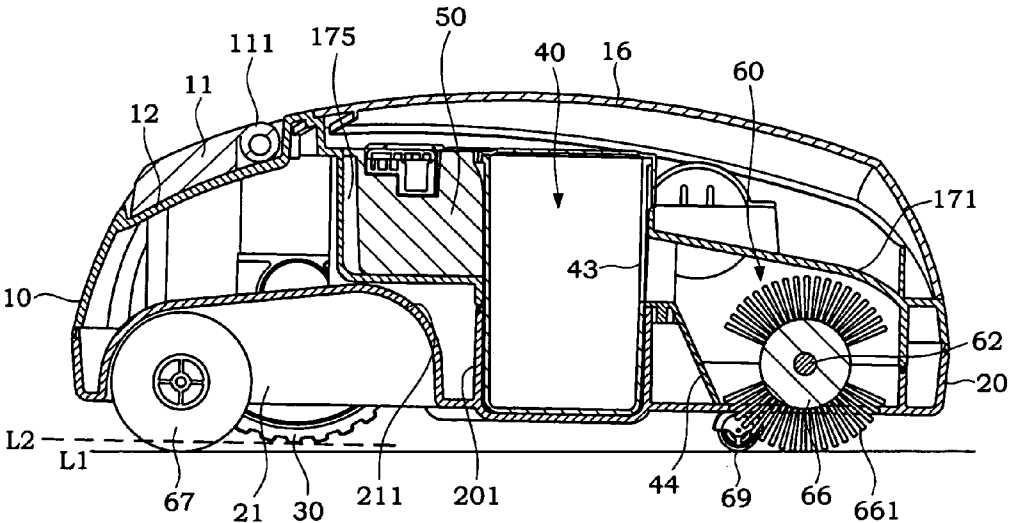


FIG. 8

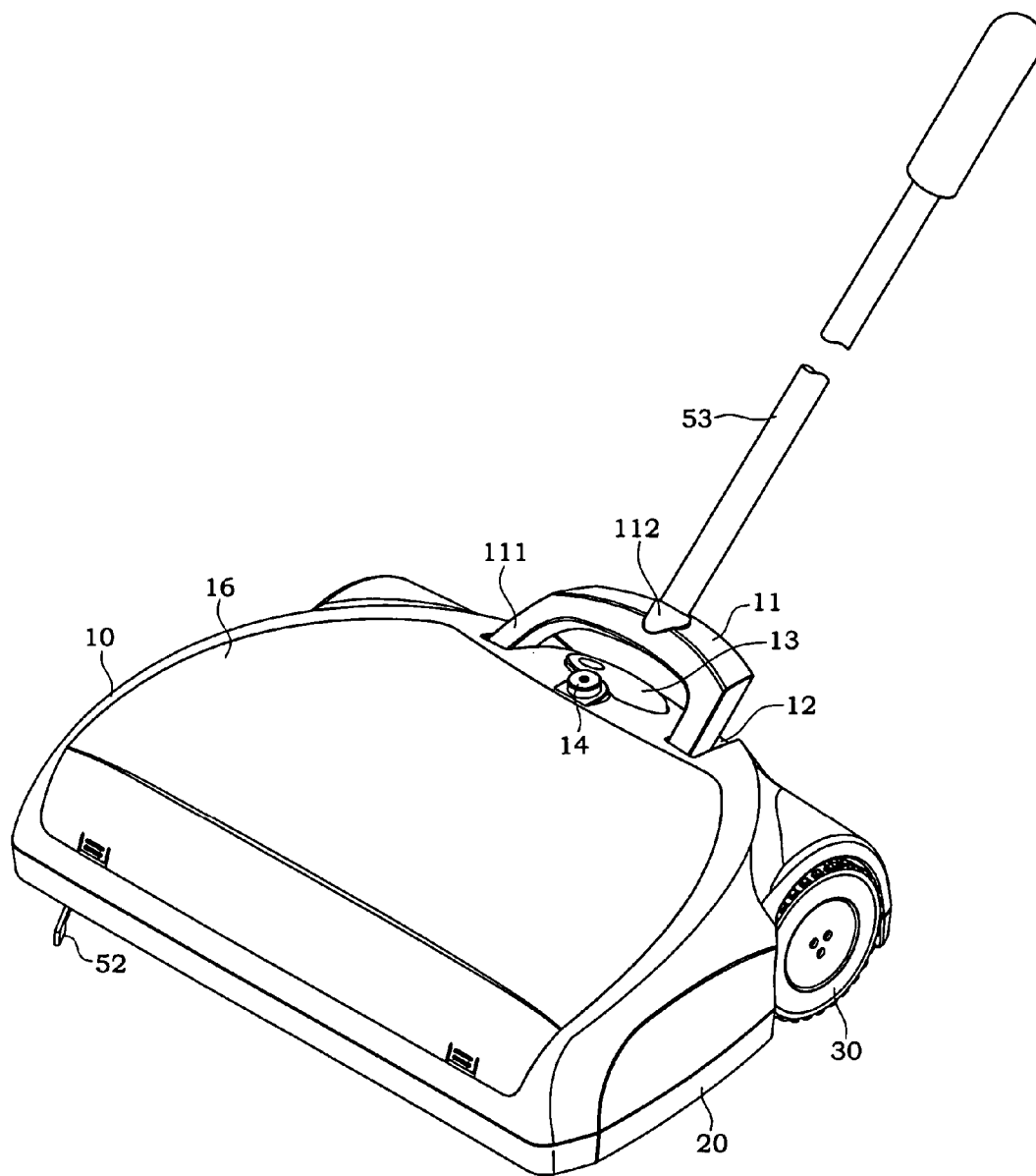


FIG. 9

REMOTE CONTROL SWEEPER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention generally relates to a cleaning machine, and more particularly to a sweeper whose moving direction can be controlled by a remote control.

[0003] 2. Description of the Related Art

[0004] The common tool used for sweeping floor is a broom, which can be used to clean up a small area of floor, but using a broom to clean up a large area of floor is very inefficient. To save efforts of the cleaning job, an electric sweeper is introduced, so that users can push and control the electric sweeper to automatically clean up and collect the dirt on the floor along the path where the sweeper passes.

[0005] Regardless of the traditional broom and electric sweeper, the inventor of the present invention believe that pushing the machine by users is difficult, particularly for a person who has a walking problem. Even for general users, operating or pushing the machine will cause backaches easily. Furthermore, the broom and electric sweepers cannot take care of the hard-to-reach areas such as a place with many obstacles or an area with a short height (under a seat, table or furniture, etc), since the structure and the volume of the broom or sweeper are restricted and thus cannot clean up the hard-to-reach areas.

SUMMARY OF THE INVENTION

[0006] To overcome the inconvenience and shortcomings of the prior art, the present invention provides a lightweight and convenient remote control sweeper.

[0007] Therefore, it is a primary objective of the invention to provide a sweeper whose moving direction can be controlled to clean up dirt and collect dust. The present invention is an effort-saving, convenient, easy-to-operate sweeper, particularly suitable for people who have a walking problem.

[0008] A secondary objective of the present invention is to provide a sweeper with a small size and a flat shape that can freely sweep and pass through a small, short and hard-to-reach area.

[0009] Another objective of the present invention is to provide a sweeper that also can be pushed manually by users to automatically clean up the floor.

[0010] A further objective of the present invention is to provide a sweeper whose brush can be replaced by users. Users can change the brush to an appropriate one according to actual needs.

[0011] The remote control sweeper in accordance with the present invention comprises:

[0012] an upper casing and a lower casing, both can be coupled manually with each other to define an interior space;

[0013] a battery, installed in the interior space;

[0014] two wheels, installed in the interior space and in contact with a floor, and each wheel being driven by a motor transmission gear module to rotate;

[0015] a sweeping brush, installed in the interior space and in contact with a floor, and controlled by a sweeping brush transmission module to rotate axially;

[0016] a dust container, detachably fixed in the interior space and disposed proximate to the sweeping brush and having a dust-collecting opening disposed on a surface corresponding to the sweeping brush for collecting the dust swept by the sweeping brush;

[0017] a remote control receiver, installed on the sweeper;

[0018] a remote control, capable of transmitting a direction control signal to the remote control receiver for controlling the moving direction of the sweeper; and

[0019] an electronic control unit, installed in the interior space and electrically coupled with the battery, motor transmission gear module, sweeping transmission module and remote control receiver.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a rear view of the present invention;

[0021] FIG. 2 is a front view of the present invention;

[0022] FIG. 3 is a first exploded view of the present invention;

[0023] FIG. 4 is a second exploded view of the present invention;

[0024] FIG. 5 is a third exploded view of the present invention;

[0025] FIG. 6 is a bottom view of the present invention;

[0026] FIG. 7 is a cross-sectional view of Section 7-7 as depicted in FIG. 2 and two wheels of the sweeper and a universal roller are in contact with a floor;

[0027] FIG. 8 is another cross-sectional view and two wheels and a universal roller of the sweeper are in contact with a floor; and

[0028] FIG. 9 is a perspective view of a sweeper being operated manually according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] Referring to FIGS. 1 and 2 respectively for the rear view and front view of the remote control sweeper in accordance with the present invention, the sweeper comprises an upper casing 10 and a lower casing 20 being engaged with each other, and the left and right sections of the upper and lower casings 10, 20 separately install a wheel 30, 30'. The upper casing 10 pivotally connects a pushing section 11 at its surface, and the pushing section 11 can be turned to any angle with respect to the pivotal end 111 as the center, and can be placed flatly and accommodated into a groove 12 of the upper casing 10. Further, the upper casing 10 further comprises a power button 13 and a remote control receiver 14, and a cover 16 for covering an upper casing opening 161 can be installed and detached easily. In FIG. 1, the upper casing 10 further comprises a power socket 15.

[0030] Referring to FIGS. 3 and 4, we can see that the upper casing 10 comes with a specific accommodating space, after the cover 16 is removed. The accommodating space comprises an object accommodating groove 171, a

motor chamber 172 for accommodating and mounting a motor 61, and the motor chamber 172 being covered by a motor hood 173, an accessing opening 174 for accessing a dust container 40 and a battery chamber 15 for accommodating a battery 50.

[0031] Referring to FIGS. 4 and 5, the lower casing 20 also includes a specific accommodating space, and the accommodating space comprises a dust container 40 accommodated and mounted into a dust container fixing groove 201, a sweeping brush opening 202 for accommodating a sweeping brush 60, and an electronic component chamber 203 for accommodating an electronic control unit 70.

[0032] The electronic component chamber 203 installs the wheels 30, 30' on both sidewalls proximate to the lower casing 20, and each wheel 30, 30' is controlled by the electronic control unit 70 and driven by a motor transmission gear module 31 to rotate. Both of the two wheels 30, 30' rotate clockwise to move the sweeper forward and counterclockwise to move the sweeper backward. If the wheel 30 on the right rotates clockwise and the wheel 30' on the left rotates counterclockwise, then the sweeper will be turned left. If the wheel 30 on the right rotates counterclockwise and the wheel 30' on the left rotates clockwise, then the sweeper will be turned right. The electronic control unit 70 is electrically connected with the battery 50, power button 13, power socket 15, motor 61, and remote control receiver 14, and the remote control receiver 14 works with a remote control 141 as shown in FIG. 2. An external power supply can be used to charge the battery 50 through the power socket 15 to supply electric power required by the operation of the foregoing components. The power button 13 turns on or off the power, and the remote control receiver 14 is controlled by the remote control 141 to drive the sweeper to move forward or backward and turn left or right. The foregoing remote control technology uses a transmission source (including infrared, radio frequency (RF), supersonic, or oral command) for a wireless transmission with a wireless receiving end.

[0033] The sweeper 60 comprises an axle 62, a brush body 66 fixed outside the axle 62, and a brush 661 installed outside the brush body 66. The brush 60 uses both ends of the axle 62 to detachably couple a pivotal base 63, 64 disposed separately on the sidewalls corresponding to a sweeping brush opening 202 of the lower casing 20. An end of the axle 62 is connected to a sweeping brush transmission module which is electrically coupled to the electronic control unit for controlling the rotation of the sweeping brush 60 to sweep the floor with the brush 661. The sweeping brush transmission module comprises a motor 61, a belt 65 and an axle 62 of the sweeping brush 60 connected to an end of the belt wheel 651.

[0034] The dust container 40 is a box body 41 covered by a lid 42. The bottom of the box body 41 is fixed to the dust container fixing groove 201 of the lower casing 20. The box body 41 has a dust connecting opening 43 disposed on a surface corresponding to the sweeping brush 60, and the lower edge 431 of the dust collecting opening 43 will not exceed the groove walls of the dust collecting fixing groove 201. The dust container fixing groove 201 installs a dirt scraper 44 at the groove wall corresponding to sweeping brush 60, and the dirt scraper 44 is tilted in contact with the

brush 661, so that the dirt and dust collected by the brush 661 are guided into the dust container 40 by the dirt scraper 44.

[0035] Referring to FIGS. 4 to 6, the lower casing 20 installs a lateral brush transmission module 51 disposed at a position proximate to a corner of the sweeping brush 60 and electrically connected to the electronic control unit 70 and the lateral brush transmission module 51 installs a lateral brush 52 disposed at the bottom of the lower casing and controlled to rotate by the transmission module 51 to clean up the area reached by the sweeping brush and further be brushed by the sweeping brush 60.

[0036] Referring to FIG. 6, the bottom of the lower casing 20 includes two universal rollers 69 and two auxiliary rollers 67. The bottom of the lower casing 20 has a groove 21, and the groove 21 has a first groove end 211 and a second groove end 212. In FIG. 7, the depth of the first groove end 211 is shallower than the second groove end 212. In FIG. 6, the two auxiliary rollers 67 in the groove 21 are pivotally coupled to both ends 681, 682 of a T-shape rod 68, and the third end of the T-shape rod 68 is movable and pivotally coupled to a pivotal base 22 in the groove 21. The horizontal level L1 of the second auxiliary roller 67 is higher than the horizontal level L2 of the two rollers 30, 30', such that the two wheels 30, 30' are in contact with the floor and move according to the universal rollers 69. On the other hand, when the two auxiliary rollers 67 are accommodated in the two groove ends 212 as shown in FIG. 8, the horizontal level L1 of the two auxiliary rollers 67 is lower than the horizontal level L2 of the two wheels 30, 30' such that the rear section of the sweeper is lifted and no longer in contact with the floor, and then the two auxiliary wheels 67 together with the universal rollers 69 move the sweeper.

[0037] Reference is made to FIG. 9, and if the two auxiliary wheels 67 work together with the universal rollers, the sweeper is moved manually. An end of a handle rod 53 is pivotally coupled into a pivotal connecting section 112 of the pushing section 11, and the pushing section 11 is tilted so that a user can use the handle rod 53 to push the sweeper to move.

[0038] In summation of the above description, the moving modes of the sweeper of the present invention include a manual mode and a remote control mode. The manual mode is described as above, and the remote control mode allows users to use a remote control 141 to control the two wheels 30, 30' to move in the same direction or opposite directions to achieve the forward, backward, left turn, right turn movements through the remote control receiver 14 and the electronic control unit 70. The moving sweeper can rotate its sweeping brush 60 to sweep the floor, and the dust is collected into the dust container 40 by the dirt scraper 44 and the dust collecting opening 43. The sweeping brush 60 can be changed to a different model as needed. If it is necessary to dump the dust in the dust container 40, users can remove the cover 16 and directly take out the whole dust container 40, and then open the cover 42 to dump the dust. After dumping the dust, users can reinstall the sweeper in a reverse process.

[0039] The sweeper of the present invention has a small size and can be operated by a remote control. The invention allows users to clean up a floor quickly without bearing the pain of backaches caused by sweeping the floor. The

sweeper of the invention can even pass through and clean up the hard-to-reach areas with obstacles or having a short height.

[0040] Other detailed functions of the invention include the integration of the pushing section 11 with the handle rod 53 for a manual mode, or the pushing section 11 being an independent handle to facilitate users to carry the sweeper. The cover 16 could be detached by hands, so that users can easily open or install the cover 16 to facilitate the cleaning of the dust container 40 or removing objects from the object accommodating groove 171.

[0041] While the invention has been described by way of example and in terms of a preferred embodiment, it is to be understood that the invention is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.

What is claimed is:

- 1. A remote control sweeper, comprising:
 - a wireless remote control receiver, installed at said sweeper; and
 - a remote control, for transmitting a direction control signal to said remote control receiver to control the moving direction of said sweeper.
- 2. The sweeper of claim 1, further comprising:
 - an upper casing and a lower casing, both being coupled with each other manually to define an interior space;
 - a battery, installed in said interior space;
 - two wheels, installed in said interior space and in contact with a floor, and each wheel being controlled by a motor transmission gear module to rotate;
 - a sweeping brush, installed in said interior space and in contact with a floor, and controlled by a sweeping brush transmission module to rotate axially;
 - a dust container, detachably fixed into said interior space and having a dust collecting opening disposed on a surface corresponding to said sweeping brush for collecting dirt and dust swept by said sweeper;
 - an electronic control unit, installed in said interior space and electrically coupled with said battery, said motor transmission gear module, said sweeper transmission module and said remote control receiver.
- 3. The sweeper of claim 2, further comprising at least two universal wheels installed at an external surface of the bottom of said lower casing.
- 4. The sweeper of claim 2, wherein said lower casing installs a lateral brush transmission module disposed at a

corner of said lower casing proximate to said sweeping brush and electrically coupled with said electronic control unit for driving a lateral brush disposed at the bottom of said lower casing to rotate.

5. The sweeper of claim 2, wherein said upper casing comprises a pushing section pivotally coupled to a surface of said upper casing.

6. The sweeper of claim 5, wherein said pushing section comprises a pivotal connecting section for pivotally coupling an end of a handle rod.

7. The sweeper of claim 6, wherein said lower casing comprises a groove having a first groove end and a second groove end, and the groove of said second groove end is shallower than the groove of said first groove; and a T-shape rod is pivotally coupled with said grooves, and an auxiliary roller is disposed separately on both ends of said T-shape rod, and said two auxiliary rollers are accommodated by the groove of said first groove end or said second groove end by said T-shape rod.

8. The sweeper of claim 2, wherein said sweeping brush comprises an axle, a brush body coupled outside said axle, and said brush body includes a brush, and said axle of said sweeping brush is controlled by said brush transmission module to rotate and said brush is provided for cleaning.

9. The sweeper of claim 8, wherein both ends of said axle of said sweeping brush are pivotally mounted onto a pivotal base of a sidewall corresponding to an opening of said sweeping brush of said lower casing, and an end of said axle is coupled to said sweeping brush transmission module.

10. The sweeper of claim 9, wherein said sweeping brush transmission module comprises a belt roller coupled with an axle end of said sweeping brush and driven by a transmission belt and a motor axle, and said motor is electrically coupled with said electronic control unit.

11. The sweeper of claim 2, further comprises an external power socket electrically coupled with said electronic control unit for charging said battery.

12. The sweeper of claim 2, wherein said upper casing further comprises an object accommodating groove disposed in an accommodating space of said upper casing.

13. The sweeper of claim 2, wherein said dust container is comprised of a box body and a lid covering said box body.

14. The sweeper of claim 2, wherein said dust container installs a dust scraper being in contact with said sweeping brush and disposed at a lower edge of said dust collecting opening of said dust container.

15. The sweeper of claim 14, wherein said dust scraper is tilted to be in contact with said sweeping brush.

16. The sweeper of claim 2, wherein said upper casing further comprises a power button electrically coupled with said electronic control unit.

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