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(71) Applicant and
(72) Inventor: **KIM, Doo Hwan** [KR/KR]; 304-701, Booyoung Apt., Tanhyeon-dong, Ilsan-gu, Goyang-si, Gyeonggi-do 411-320 (KR).

(74) Agent: **KIM, Won-Sik**; Hyundai Venturetel 707, 642-1, Yeoksam-dong, Kangnam-gu, Seoul 135-910 (KR).

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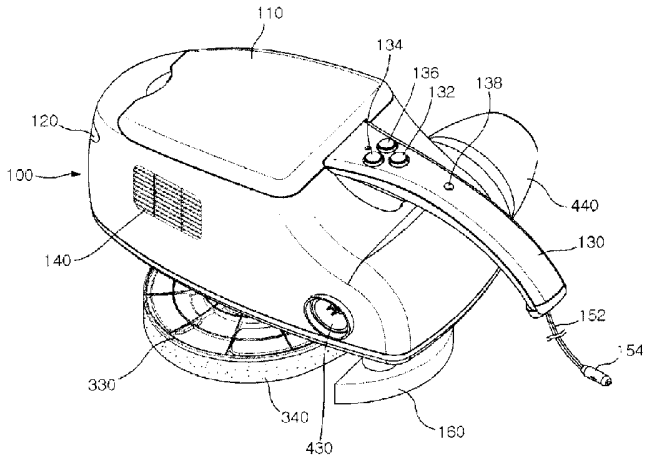
(54) Title: MULTIFUNCTIONAL CLEANER FOR VEHICLES



(57) Abstract: Provided is a multifunctional cleaner for vehicles, which includes a housing member that forms a main body; a loading portion that is embedded in the housing member and stores a cleanser for washing a vehicle with water or a brightener for polishing the vehicle; a spray member for spraying the cleanser or brightener out of the loading member; a rotation plate that is attached to a bottom surface of the housing member; an air intake fan that is embedded in the housing member and takes in external air; a dust collecting case that is detachably mounted on the outside of the housing member and stores collected dust; and a filter that is detachably attached into the dust collecting case and filters the dust. The multifunctional cleaner for vehicles according to the present invention is very convenient because a vehicle can be vacuum-cleaned, washed with water, and polished at a time by a private person. Also, since a user does not need to purchase additional devices required for respective cleaning operations, the multifunctional cleaner is very economical. Further, it is serviceable that a vehicle can be cleaned irrespective of time and place without occupying any additional space. Moreover, only appropriate amounts of cleanser and brightener are used, thus promoting the economical efficiency of a user and preventing environmental pollution.

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Description

MULTIFUNCTIONAL CLEANER FOR VEHICLES

Technical Field

[1] The present invention relates to a multifunctional cleaner for vehicles, and more particularly, to a multifunctional cleaner for vehicles, which enables a user to vacuum-clean dirt in a vehicle, wash the outside of the vehicle, and polish the outside of the vehicle at a time, makes use of the vehicle s own electric power, and is small-sized to carry.

Background Art

[2] In general, a process of neatly cleaning the inside and outside of a vehicle may include an operation of vacuum-cleaning dust in the vehicle, an operation of washing the outside of the vehicle covered with dust or smeared with dirt, such as stains, and an operation of polishing the outside of the vehicle.

Disclosure of Invention

Technical Problem

[3] During the vacuum cleaning operation, dirt, such as dust, is removed from the vehicle using an ordinary vacuum cleaner for vehicles. Such a vacuum cleaner has been supplied to the market already.

[4] During the washing operation, a hose is directly connected to a water pipe, and a nozzle is attached to an end portion of the hose, so that the vehicle is sprinkled with water through the nozzle. When a person directly washes the vehicle with water, it is troublesome that the vehicle should be always washed near the water pipe and it is inconvenient to prepare additional devices, such as the hose and nozzle. Further, when a person periodically assigns the washing operation to a vehicle washing service, it costs a great deal to have his/her vehicle washed. Also, staffs of the vehicle washing service have to wash the vehicle by sprinkling water from a wash pipe on the outside of the vehicle through a hose and nozzle in the same manner as a person does.

[5] During the polishing operation, an outer appearance of the vehicle is polished using a considerably large-sized mechanical polisher. Since the polisher is too large and high-priced, it is uncommon for a person to buy the polisher for the polishing operation. Therefore, most vehicle owners make payment and entrust the polishing operation to a specialized vehicle polishing service having polishers. However, it is inefficient that they should spend expenses to have even a simple polishing operation done.

[6] As mentioned thus far, it is common that a vehicle may be cleaned up by a private person who owns ordinary cleaning equipment, such as a vacuum cleaner, wash

devices, and a polisher, at need, or automatically washed out in commercial car washes. However, conventional wash devices are high-priced or inconvenient to use, and it is complicated to buy all wash devices corresponding to respective functions. Additionally, when the vehicle is automatically washed by a specialized service company, it costs a lot of deal and the vehicle may get scratched.

[7] In recent years, a variety of cleaners for vehicles have been developed and put on the market to solve the above problems. However, most of the cleaners are merely focused on a vacuum cleaning function or roughly made. Furthermore, it is unpractical that a consumer should purchase a vacuum cleaner, a polisher, and a sprayer separately.

[8] Above all, although there are some portable vacuum cleaners for vehicles, few wash devices and polishers are made small-sized and portable up to the present. Also, each of cleaning devices for vehicles is very expensive and does not fulfill various functions (i.e., a vacuum cleaning function, a washing function, and a polishing function). Therefore, it is imperatively necessary to develop a new cleaner that is small-sized to carry, sold at a reasonable price, and fulfills all the three functions.

Technical Solution

[9] The present invention provides a multifunctional cleaner for vehicles, which is small-sized to carry and fabricated at low cost and enables a user to vacuum-clean dust or dirt in a vehicle, wash the outside of the vehicle, and polish the outside of the vehicle at a time.

[10] According to an aspect of the present invention, there is provided a multifunctional cleaner including a housing member that forms a main body; a loading portion that is embedded in the housing member and stores a cleanser for washing a vehicle with water or a brightener for polishing the vehicle; a spray member for spraying the cleanser or brightener out of the loading member; a rotation plate that is attached to a bottom surface of the housing member; an air intake fan that is embedded in the housing member and takes in external air; a dust collecting case that is detachably mounted on the outside of the housing member and stores collected dust; and a filter that is detachably attached into the dust collecting case and filters the dust.

[11] The multifunctional cleaner may further include a driving motor that drives the rotation plate; and a cleaning motor that drives the air intake fan.

[12] Meanwhile, the multifunctional cleaner may further include a driving motor that drives the rotation plate and the air intake fan at the same time.

[13] The multifunctional cleaner may further include a fixing case that is embedded in the housing member and fixes the cleaning motor and the air intake fan; a fixing cover that is formed on one end portion of the fixing case to protect the air intake fan and

combined with the dust collecting case; and an exhaust hole that is formed on the other end portion of the fixing case and exhausts the taken air out of the housing member.

[14] The spray member may include a discharge member that is formed at a lower end portion of the loading member and discharges the cleanser or brightener out of the loading portion; a pumping motor that is connected to the discharge member and pumps the cleanser or brightener out of the loading portion; and a spray nozzle that is connected to the pumping motor and sprays the cleanser or brightener, which is discharged from the loading portion, out of the housing member.

[15] The discharge member may include a top outlet that is formed in a bottom surface of the loading portion and includes an outer cover having a through hole, a moving unit embedded in the outer cover and for hermetically sealing a lower portion of the through hole, an elastic spring installed on the moving unit, and a rubber pad installed under the moving unit and for hermetically sealing the lower portion of the through hole; a bottom outlet that is formed in an inner bottom surface of the housing member to correspond to the top outlet and includes a convex protrusion corresponding to a lower end portion of the moving unit and a drainage hole for guiding the cleanser or brightener out of the discharge member; and a discharge hose that has one end portion connected to an upper portion of the through hole of the outer cover and the other end portion disposed in the loading portion, wherein a metal weight is installed at the other end portion of the discharge hose.

[16] The multifunctional cleaner may further include a gearbox that changes revolutions per minute (RPM) of the driving motor and transmits rotary power of the driving motor whose speed is changed to the rotation plate; and a shaft that connects the gearbox and the rotation plate and forms a central axis on which the rotation plate rotates.

[17] The multifunctional cleaner may further include a brush that is attached as a Velcro type to the bottom surface of the rotation plate and sweeps away dirt on the outside of the vehicle.

[18] The multifunctional cleaner may further include a flexible cleaning hose that is detachably attached to the outside of the dust collecting case; and a suction nozzle that is attached to an end portion of the cleaning hose and sucks dust.

[19] The multifunctional cleaner may further include a housing cap that is installed in a top surface of the housing member and opens or closes off the housing member; a handle that is formed at the back of the housing member and on which a plurality of switches are installed to control a variety of motors embedded in the housing member; and a groove that is formed in front of the housing cap and allows a user to rest his/her hand.

[20] The multifunctional cleaner may further include a latch unit that is attached to a rear lower end portion of the housing member and protects the user from the cleanser or

brightener sprayed on the outside of the vehicle; a connection tool that is electrically connected to a car cigar lighter; and a flexible power cord that is connected to the connection tool and transmits electric power.

Brief Description of the Drawings

[21] FIG. 1 is a perspective view of a multifunctional cleaner for vehicles according to an exemplary embodiment of the present invention;

[22] FIG. 2 is a side view of the multifunctional cleaner shown in FIG. 1;

[23] FIG. 3 is an exploded view of the multifunctional cleaner shown in FIG. 1;

[24] FIG. 4 is a longitudinal sectional view of the multifunctional cleaner shown in FIG. 1;

[25] FIG. 5 is a cross sectional view of the multifunctional cleaner shown in FIG. 1;

[26] FIG. 6 is an exploded view of a discharge member of the multifunctional cleaner shown in FIG. 1;

[27] FIGs. 7 and 8 are diagrams showing uses of the multifunctional cleaner shown in FIG. 1;

[28] FIG. 9 is an exploded view of a multifunctional cleaner for vehicles according to another exemplary embodiment of the present invention;

[29] FIGs. 10 and 11 are diagrams showing uses of the multifunctional cleaner shown in FIG. 9; and

[30] FIG. 12 is a perspective view of a dust collecting case of the multifunctional cleaner shown in FIG. 9.

Best Mode for Carrying Out the Invention

[31] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which exemplary embodiments of the invention are shown.

[32] FIGs. 1 through 8 illustrate a multifunctional cleaner for vehicles according to an exemplary embodiment of the present invention.

[33] Referring to FIG. 1, the multifunctional cleaner of the present embodiment fulfills a washing and polishing function and a vacuum cleaning function.

[34] To perform the washing and polishing function, the multifunctional cleaner includes a housing member 100 that forms a main body, a loading portion 170 that is embedded in the housing member 100 and in which a cleanser for washing a vehicle with water or a brightener for polishing the vehicle is loaded, a spray member for spraying the cleanser or brightener loaded in the loading portion 170, a rotation plate 330 attached to a bottom surface of the housing member 100, and a driving motor 300 for rotating the rotation plate 330.

[35] In the meantime, a housing cap 110 is installed in a top surface of the housing

member 100 to open or close off the housing member 100. The housing cap 110 combines with a top surface of the housing member 100 such that it is hinge-jointed to a portion of the housing member 100 or is capable of being completely separated from the housing member 100. The housing cap 110 is opened so that the loading portion 170 containing the cleanser or brightener can be inserted into the housing member 100. Meanwhile, the cleanser or brightener is optionally put in the loading portion 170 according to the cleaner s purpose. For example, the cleanser may be put in the loading portion 170 to wash a vehicle with water, and the brightener may be put in the loading portion 170 to polish an outer appearance of the vehicle.

[36] A concave groove 120 is formed in front of the housing cap 110 to rest a user s hand, and a handle 130 is formed at the back of the housing member 100 such that the user can take a grip of the handle 130. Thus, while the user is taking a grip of the handle 130 by one hand and resting the other hand on the groove 120, he/she uses the multifunctional cleaner for vehicles.

[37] The spray member, which is used to spray the cleanser or brightener contained in the loading portion 170 out of the housing member 100, includes a discharge member 210, a pumping motor 240, and a spray nozzle 250. The discharge member 210 serves to discharge the cleanser or brightener out of the loading portion 170. The pumping motor 240 pumps the cleanser or brightener contained in the loading portion 170 through the discharge member 210 out of the loading portion 170. The spray nozzle 250 is connected to the pumping motor 240 and serves to spray the cleanser or brightener, which is discharged out of the loading portion 170, out of the housing member 100. In this case, a hollow tube (not shown) through which the cleanser or brightener passes may be connected between the discharge member 210 and the pumping motor 240 and between the pumping motor 240 and the spray nozzle 250. Accordingly, with the above-described action of the pumping motor 240, the cleanser or brightener contained in the loading portion 170 flows out of the loading portion 170 through the discharge member 210 and then is sprayed out of the housing member 100 through the spray nozzle 250 connected to the pumping motor 240. In this case, the spray nozzle 250 may be controlled in diameter and position to adjust strength and position at which the cleanser or brightener is sprayed.

[38] Referring to FIG. 6, the discharge member 210 includes a top outlet 220, a bottom outlet 230, and a discharge hose 260. The top outlet 220 is formed in a bottom surface of the loading portion 170, and the bottom outlet 230 is formed in an inner bottom surface of the housing member 100 to correspond to the top outlet 220. The discharge hose 260 has one end portion connected to the top outlet 220 and the other end portion disposed in the loading portion 170. Meanwhile, the top outlet 220 includes an outer cover 222, a moving unit 224, an elastic spring 226, and a rubber pad 228. The outer

cover 222 includes a through hole 223 that is connected to the discharge hose 260. The moving unit 224 is embedded in the outer cover 222 and hermetically seals a lower portion of the through hole 223 of the outer cover 222. The elastic spring 226 is installed on the moving unit 224. The rubber pad 228 is installed under the moving unit 224 and hermetically seals the lower portion of the through hole 223 of the outer cover 222. Also, a convex protrusion 232 and a drainage hole 234 are formed on a top surface of the bottom outlet 230. The protrusion 232 corresponds to a lower end portion of the moving unit 224, and the drainage hole 234 guides the cleanser or brightener out of the discharge member 210.

[39] Accordingly, the cleanser or brightener does not flow out of the loading portion 170 until the loading portion 170 is loaded in the housing member 100, because the elastic spring 226 leads the moving unit 225 to hermetically seal the lower portion of the through hole 223 of the outer cover 222. Also, when the loading portion 170 is installed in the housing member 100, the protrusion 232 of the bottom outlet 230 pushes the moving unit 224 upward. Thus, the moving unit 224 elastically moves so that the through hole 223 of the outer cover 222 is not sealed any more, and the cleanser or brightener contained in the loading portion 170 passes through the discharge hose 260 and the through hole 223 of the outer cover 222 and is discharged through the drainage hole 234 of the bottom outlet 230. In this manner, the cleanser or brightener, which is discharged from the loading portion 170 through the discharge member 210, passes through the pumping motor 240 and is sprayed through the spray nozzle 250 out of the housing member 100.

[40] Meanwhile, a metal weight 262 may be installed at an end portion of the discharge hose 260 such that even if a small amount of cleanser or brightener remains in the loading portion 170 and concentrates on any corner of the loading portion 170, the remaining cleanser or brightener can be efficiently discharged.

[41] The rotation plate 330, which rotates due to the driving motor 300, is installed on the bottom surface of the housing member 100, and a brush 340 is attached to the bottom surface of the rotation plate 330 to sweep away the dirt on the outer appearance of the vehicle. The rotation plate 330 may be spirally combined with and fixed to a lower end portion of the housing member 100 so that it is not separated from the housing member 100 during the cleaning operation. On the other hand, when a vacuum cleaning operation is performed or when the cleaner is not driven, the rotation plate 330 may be separated from the housing member 100. Also, the brush 340 attached to the bottom surface of the rotation plate 330 may have various forms according to its uses. In particular, the brush 340 may be attached as a Velcro type to the bottom surface of the rotation plate 330 such that it is detached from the rotation plate 330.

[42] In addition to the driving motor 300 for driving the rotation plate 330, the housing

member 100 further includes a gearbox 310 and a shaft 320. The gearbox 310 serves to change revolutions per minute (RPM) of the driving motor 300 and transmit rotary power of the driving motor 300 whose speed is changed to the rotation plate 330, and the shaft 320 connects the gearbox 310 and the rotation plate 330. In a typical washing or polishing operation, since the rotation plate 330 is different in RPM from the driving motor 300, the housing member 100 may be structured such that the gearbox 310 changes the RPM of the driving motor 300 to an appropriate level and the rotary power of the driving motor 300 whose speed is changed is transmitted to the rotation plate 330. Accordingly, a plurality of gears are installed in the gearbox 310 to change the RPM of the driving motor 300. Also, an end portion of the shaft 320 protrudes from the housing member 100 and the rotation plate 330 coupled to the end portion of the shaft 320 rotates on the shaft 320 as its central axis.

[43] Also, the cleanser or brightener sprayed on the outer appearance of the vehicle may splash about due to the rotations of the rotation plate 330, thus making the user s clothes unclean. Therefore, when the vehicle is cleaned or polished, a latch unit 160, which is molded into an arc, may be attached to a rear lower end portion of the housing member 100 in order to protect the user from the cleanser or brightener sprayed on the outside of the vehicle. Further, the latch unit 160 is detachably attached to the housing member 100, so that the cleaner can be easily moved and kept and the latch unit 160 can be detached from the housing member 100 during a vacuum cleaning operation.

[44] To perform another function (i.e., the vacuum cleaning function) of the multi-functional cleaner for vehicles according to the present invention, the housing member 100 includes an air intake fan 410 for taking in external air and a cleaning motor 400 for rotating the intake fan 410. The intake fan 410 and the cleaning motor 400 are fixed to the inside of the housing member 100 by a fixing case 422.

[45] A fixing cover 420 is combined with one end portion of the fixing case 422 (i.e., one lateral surface of the housing member 100) to protect the intake fan 410, and an exhaust hole 430 is formed on the other end portion of the fixing case 422 (i.e., the opposing lateral surface of the housing member 100) to exhaust air taken into the housing member 100.

[46] In the meantime, as shown in FIG. 7, the fixing cover 420 and the exhaust hole 430 may be closed with caps 482 and 484, respectively, during the washing or polishing operation such that the cleanser or brightener does not flow into the housing member 100.

[47] Also, as shown in FIG. 8, the caps 482 and 484 are removed from the fixing cover 420 and the exhaust hole 430, respectively, during the vacuum cleaning operation. A dust collecting case 440, which stores collected dust, is detachably mounted on the outside of the fixing cover 420 from which the cap 484 is removed, and a filter 450 is

detachably attached into the dust collecting case 440 to filter dust. Also, a flexible cleaning hose 460 is mounted on the outside of the dust collecting case 440, and a suction nozzle 470 is attached to an end portion of the cleaning hose 460 to suck dust. Meanwhile, the cleaning hose 460 may be detachably mounted on the outside of the dust collecting case 440.

[48] Furthermore, a variety of switches are installed on the handle 130 of the housing member 100 to drive the driving motor 300, the pumping motor 240, and the cleaning motor 400. The switches include at least a spray switch 132, a rotation switch 134, a cleaning switch 136, and a power light emitting diode (LED) 138. The spray switch 132 drives the pumping motor 240 to spray the cleanser or brightener contained in the loading portion 170. The rotation switch 134 drives the driving motor 300 to rotate the rotation plate 330. The cleaning switch 136 drives the cleaning motor 400 to rotate the air intake fan 410. The power LED 138 is automatically turned on when power is supplied to the cleaner. Meanwhile, each of the rotation switch 134 and the cleaning switch 136 may be pushed once and then turned on, and it may be pushed again and then turned off. The spray switch 132 may be structured such that the cleanser or brightener is sprayed only while the user is pushing the spray switch 132.

[49] Also, a flexible power cord 152 is connected to one side of the handle 130 to transmit electric power, and a connection tool 154 is disposed at an end portion of the power cord 152 such that it is electrically connected to a car cigar lighter. Thus, when the connection tool 154 is connected to the car cigar lighter, the power LED 138 is turned on and the user can operate the switches to drive a variety of motors included in the housing member 100. Meanwhile, in addition to a method of using the vehicle's own power, an additional power supply source may be prepared inside or outside the housing member 100 and a dry battery or charging battery may be positioned in the power supply source.

[50] Meanwhile, in order to give off heat generated from the motors of the housing member 100, a ventilation portion 140 including a plurality of holes may be formed on a lateral surface of the housing member 100. The ventilation portion 140 permits hot air to be exhausted out of the housing member 100 and permits cool air to be sucked into the housing member 100. In this case, an upper portion of each of the holes of the ventilation portion 140 may slope downward such that external rainwater or cleanser is not sucked into the housing member 100 through the ventilation portion 140.

[51] Hereinafter, the operation of the above-described multifunctional cleaner for vehicles will be described.

[52] When the inside of a vehicle covered with dust is vacuum-cleaned, the caps 482 and 484 that cover the exhaust hole 430 and the fixing cover 420, respectively, are removed, the dust collecting case 440 is mounted on the outside of the fixing cover

420, and the cleaning hose 460 and the suction nozzle 470 are attached to the dust collecting case 440. In this case, the cleaning hose 460 and the suction nozzle 470 may be integrally formed. Thereafter, the connection tool 154 is connected to the car cigar lighter so that the power LED 138 is turned on and the cleaning switch 136 is switched on. Once the cleaning switch 136 is switched on, the cleaning motor 400 embedded in the housing member 100 is driven to rotate the air intake fan 410 and thus, external dust is sucked through the suction nozzle 470. In this case, the dust sucked through the suction nozzle 470 is filtered by the filter 450 and stored in the dust collecting case 440, and taken air is exhausted through the exhaust hole 430 out of the housing member 100.

[53] Also, when the outside of the vehicle is washed or polished, the rotation plate 330 is combined with the shaft 320 of the housing member 100. Then, the brush 340 is appropriately selected according to a desired operation and attached to the bottom surface of the rotation plate 330. Subsequently, the exhaust hole 430 and the fixing cover 420 are closed with the caps 482 and 484, respectively, to prevent the cleanser or brightener from flowing into the housing member 100. An appropriate cleanser or brightener is put in the loading portion 170, the housing cap 110 is opened, and the loading portion 170 is inserted into the housing member 100.

[54] After the connection tool 154 is connected to the car cigar lighter, the spray switch 132 is pushed for a predetermined time to drive the pumping motor 240. Thus, the cleanser or brightener flows out of the loading portion 170 through the discharge member 210 and is sprayed through the spray nozzle 250 on the outside of the vehicle.

[55] When the rotation switch 134 is switched on to drive the driving motor 300, the rotation plate 330 rotates, and the outside of the vehicle is cleaned or polished using the brush 340 attached to the rotation plate 330.

[56] FIGs. 9 through 12 illustrate a multifunctional cleaner for vehicles according to another exemplary embodiment of the present invention. In the present embodiment, the same reference numerals are used to denote the same elements as in the previous embodiment.

[57] The multifunctional cleaner for vehicles includes a housing member 100 that forms a main body, a cleanser loading portion 172 in which a cleanser for washing a vehicle with water is loaded, a brightener loading portion 174 in which a brightener for polishing the vehicle is loaded, a spray member for spraying any one of the cleanser and the brightener loaded in the respective loading portions 172 and 174, a rotation plate 330 attached to a bottom surface of the housing member 100, an air intake fan 510 that is embedded in the housing member 100 and takes in external air, a driving motor 500 that rotates the rotation plate 330 and the air intake fan 510 at the same time, and a dust collecting case 540 that stores collected dust.

[58] In the present embodiment, both the cleanser loading portion 172 and the brightener loading portion 174 can be embedded in the housing member 100. In this case, each of the loading portions 172 and 174 may include a spray member. In the present embodiment, the spray member is the same in construction as the spray member of the first embodiment. Accordingly, each of the loading portions 172 and 174 includes a discharge member 210, a pumping motor 240, and a spray nozzle 250. The discharge member 210 serves to discharge the cleanser or brightener out of the loading portions 172 and 174. The pumping motor 240 pumps the cleanser or brightener contained in the loading portions 172 and 174 through the discharge member 210 out of the loading portions 172 and 174. The spray nozzle 250 is connected to the pumping motor 240 and serves to spray the cleanser or brightener, which is discharged out of the loading portions 172 and 174, out of the housing member 100.

[59] Also, the driving motor 500, which is installed in the housing member 100, drives the air intake fan 510 for a vacuum cleaning operation and simultaneously, rotates the rotation plate 330 for a washing or polishing operation.

[60] Further, as shown in FIG. 10, the housing member 100 includes a gearbox 310 and a shaft 320 as in the first embodiment. The gearbox 310 changes RPM of the driving motor 500 and transmits rotary power of the driving motor 500 whose speed is changed to the rotation plate 330, and the shaft 320 connects the gearbox 310 and the rotation plate 330. Also, a plurality of gears are installed in the gearbox 310 to change the RPM of the driving motor 500, and the rotation plate 330 coupled to an end portion of the shaft 320 rotates on the shaft 320 as its central axis. In addition, a brush 340 is detachably attached to a bottom surface of the rotation plate 330 to sweep away dirt on the outer appearance of the vehicle.

[61] Meanwhile, as shown in FIG. 11, the air intake fan 510, which is rotated by the driving motor 500, needs many RPM such that it sucks external air during the vacuum cleaning operation to vacuumize air around the air intake fan 510. Thus, the air intake fan 510 is directly connected to the driving motor 500. Also, as shown in FIG. 10, to perform the vacuum cleaning operation, the rotation plate 330 is detached from the housing member 100, and the dust collecting case 540 is attached to the bottom surface of the housing member 100.

[62] Thereafter, as shown in FIG. 12, the dust collecting case 540 of the present embodiment is structured such that a suction opening 542 for sucking dust is formed in a front surface of the dust collecting case 540, and an air intake hole 544 is formed in a top portion of the dust collecting case 540. Meanwhile, since the air intake hole 544 is a path that connects the air intake fan 510 and the dust collecting case 540, the dust collecting case 540 may be attached to the bottom surface of the housing member 100 such that the air intake hole 544 is connected to the air intake fan 510. Also, a filter

450, which is used to filter dust, is detachably installed between the air intake hole 544 and the air intake fan 510. Further, combination units 612 and 614 are formed on one top surface of the dust collecting case 540 such that the dust collecting case 540 is combined with the housing member 100. In addition, a flexible cleaning hose 460 is detachably attached to the suction opening 542, which is formed on the front surface of the dust collecting case 540 to suck dust, and a suction nozzle 470 is formed on an end portion of the cleaning hose 460 to directly suck dust.

[63] In the present embodiment, since the multifunctional cleaner for vehicles is the same in construction as that of the first embodiment except for the above-described elements, a detailed description of the same elements as in the first embodiment will not be presented here.

[64] Hereinafter, the operation of the above-described multifunctional cleaner for vehicles will be described.

[65] When the inside of a vehicle covered with dust is vacuum-cleaned, the rotation plate 330 that is attached to the bottom surface of the housing member 100 is removed, the dust collecting case 540 is mounted on the bottom surface of the housing member 100, and the cleaning hose 460 and the suction nozzle 470 are attached to the dust collecting case 540. Thereafter, a connection tool 154 is connected to a car cigar lighter, and a switch installed on a handle is operated to start the vacuum clean operation.

[66] When the outside of the vehicle is washed or polished, the dust collecting case 540 is removed, and the rotation plate 330 is combined with the shaft 320 of the housing member 100. Then, the brush 340 is appropriately selected according to a desired operation and attached to the bottom surface of the rotation plate 330. Subsequently, an appropriate cleanser or brightener is put in the loading portion 172 (or 174), the housing cap 110 is opened, and the loading portion 172 (or 174) is inserted into the housing member 100. The connection tool 154 is connected to the car cigar lighter, and then the vehicle is washed with water or polished by operating a variety of switches.

[67] Although the present invention has been described with reference to certain exemplary embodiments thereof, it will be understood by those skilled in the art that a variety of modifications and variations may be made to the present invention without departing from the spirit or scope of the present invention defined in the appended claims, and their equivalents.

Industrial Applicability

[68] The multifunctional cleaner for vehicles according to the present invention is very convenient because a vehicle can be vacuum-cleaned, washed with water, and polished at a time by a private person. Also, since a user does not need to purchase additional

devices required for respective cleaning operations, the multifunctional cleaner is very economical. Further, it is serviceable that a vehicle can be cleaned irrespective of time and place without occupying any additional space. Moreover, only appropriate amounts of cleanser and brightener are used, thus promoting the economical efficiency of a user and preventing environmental pollution.

Claims

[1] A multifunctional cleaner, which fulfills a vehicle washing or polishing function and a vehicle vacuum-cleaning function, the cleaner comprising:
a housing member that forms a main body;
a loading portion that is embedded in the housing member and stores a cleanser for washing a vehicle with water or a brightener for polishing the vehicle;
a spray member for spraying the cleanser or brightener out of the loading member;
a rotation plate that is attached to a bottom surface of the housing member;
an air intake fan that is embedded in the housing member and takes in external air;
a dust collecting case that is detachably mounted on the outside of the housing member and stores collected dust; and
a filter that is detachably attached into the dust collecting case and filters the dust.

[2] The cleaner according to claim 1, further comprising:
a driving motor that drives the rotation plate; and
a cleaning motor that drives the air intake fan.

[3] The cleaner according to claim 1, further comprising a driving motor that drives the rotation plate and the air intake fan at the same time.

[4] The cleaner according to claim 2, further comprising:
a fixing case that is embedded in the housing member and fixes the cleaning motor and the air intake fan;
a fixing cover that is formed on one end portion of the fixing case to protect the air intake fan and combined with the dust collecting case; and
an exhaust hole that is formed on the other end portion of the fixing case and exhausts the taken air out of the housing member.

[5] The cleaner according to claim 1, wherein the spray member includes:
a discharge member that is formed at a lower end portion of the loading member and discharges the cleanser or brightener out of the loading portion;
a pumping motor that is connected to the discharge member and pumps the cleanser or brightener out of the loading portion; and
a spray nozzle that is connected to the pumping motor and sprays the cleanser or brightener, which is discharged out of the loading portion, out of the housing member.

[6] The cleaner according to claim 5, wherein the discharge member includes:
a top outlet that is formed in a bottom surface of the loading portion and includes

an outer cover having a through hole, a moving unit embedded in the outer cover and for hermetically sealing a lower portion of the through hole, an elastic spring installed on the moving unit, and a rubber pad installed under the moving unit and for hermetically sealing the lower portion of the through hole;

a bottom outlet that is formed in an inner bottom surface of the housing member to correspond to the top outlet and includes a convex protrusion corresponding to a lower end portion of the moving unit and a drainage hole for guiding the cleanser or brightener out of the discharge member; and

a discharge hose that has one end portion connected to an upper portion of the through hole of the outer cover and the other end portion disposed in the loading portion, wherein a metal weight is installed at the other end portion of the discharge hose.

[7] The cleaner according to any one of claims 2 and 3, further comprising:

a gearbox that changes revolutions per minute (RPM) of the driving motor and transmits rotary power of the driving motor whose speed is changed to the rotation plate; and

a shaft that connects the gearbox and the rotation plate and forms a central axis on which the rotation plate rotates.

[8] The cleaner according to any one of claims 1 through 6, further comprising a brush that is attached as a Velcro type to the bottom surface of the rotation plate and sweeps away dirt on the outside of the vehicle.

[9] The cleaner according to any one of claims 1 through 6, further comprising:

a flexible cleaning hose that is detachably attached to the outside of the dust collecting case; and

a suction nozzle that is attached to an end portion of the cleaning hose and sucks dust.

[10] The cleaner according to any one of claims 1 through 6, further comprising:

a housing cap that is installed in a top surface of the housing member and opens or closes off the housing member;

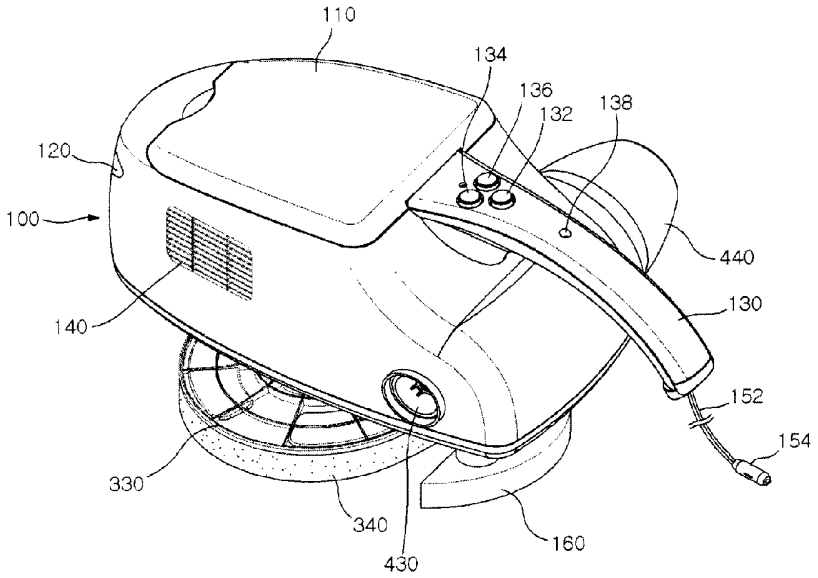
a handle that is formed at the back of the housing member and on which a plurality of switches are installed to control a variety of motors embedded in the housing member; and

a groove that is formed in front of the housing cap and allows a user to rest his/her hand.

[11] The cleaner according to any one of claims 1 through 6, further comprising a latch unit that is attached to a rear lower end portion of the housing member and protects the user from the cleanser or brightener sprayed on the outside of the vehicle.

[12] The cleaner according to any one of claims 1 through 6, further comprising:
a connection tool that is electrically connected to a car cigar lighter; and
a flexible power cord that is connected to the connection tool and transmits electric power.

[Fig. 1]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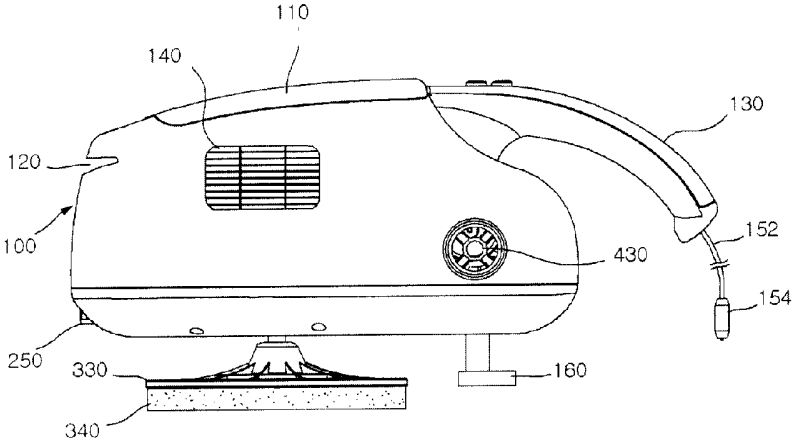
[Fig. 2]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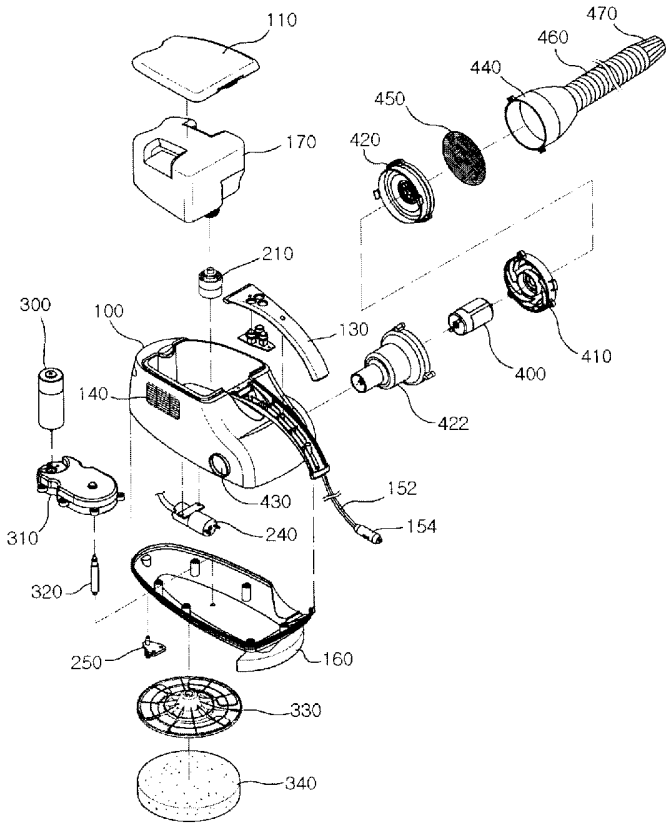
[Fig. 3]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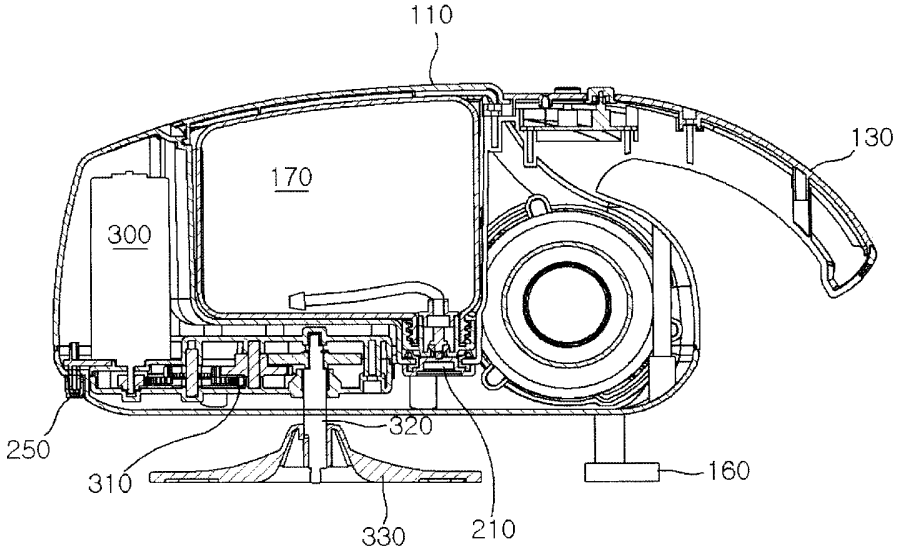
[Fig. 4]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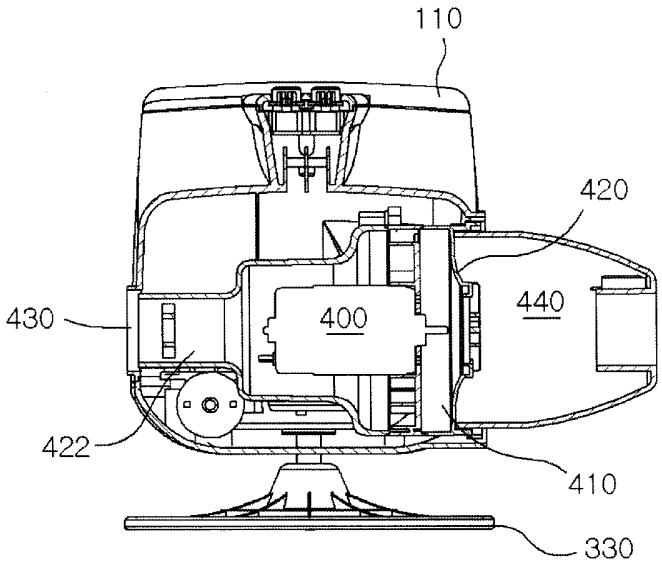
[Fig. 5]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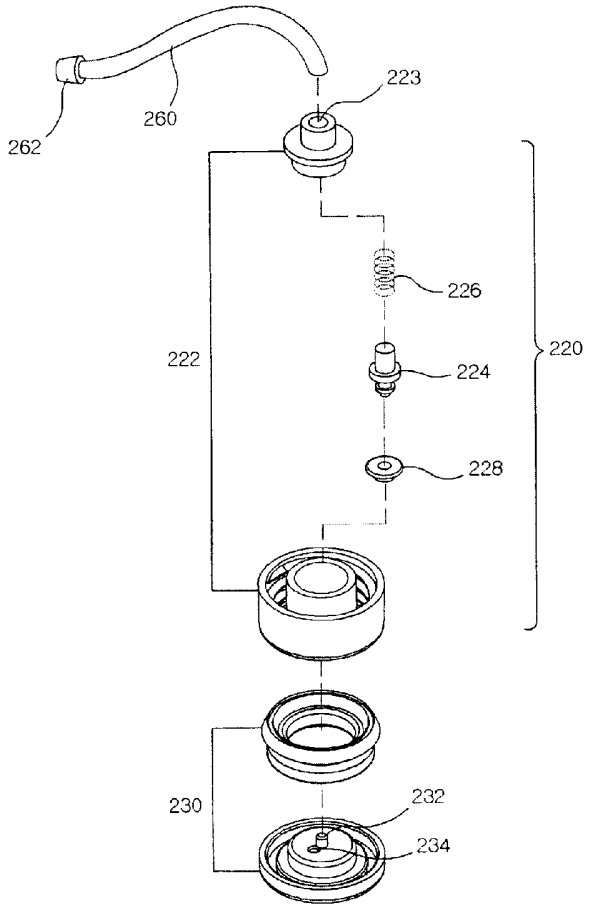
[Fig. 6]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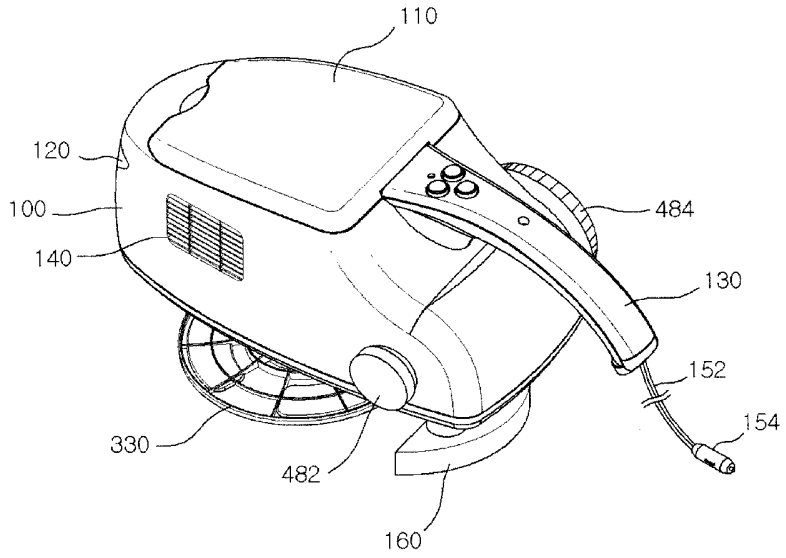
[Fig. 7]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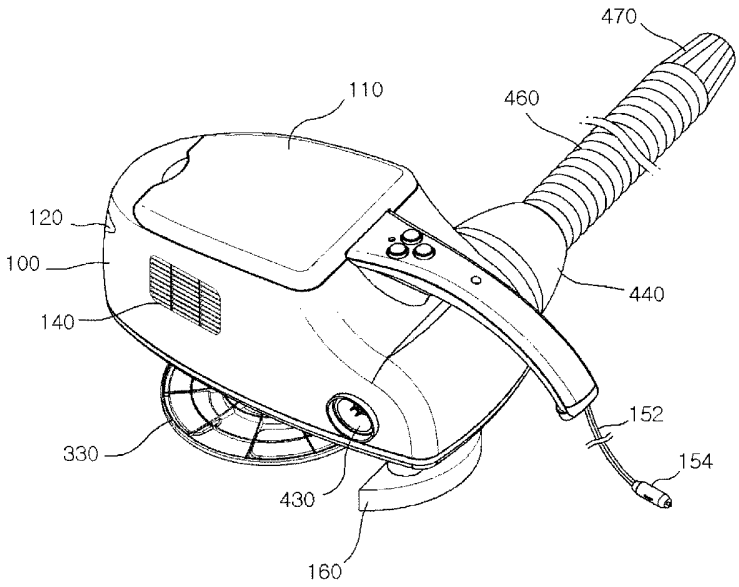
[Fig. 8]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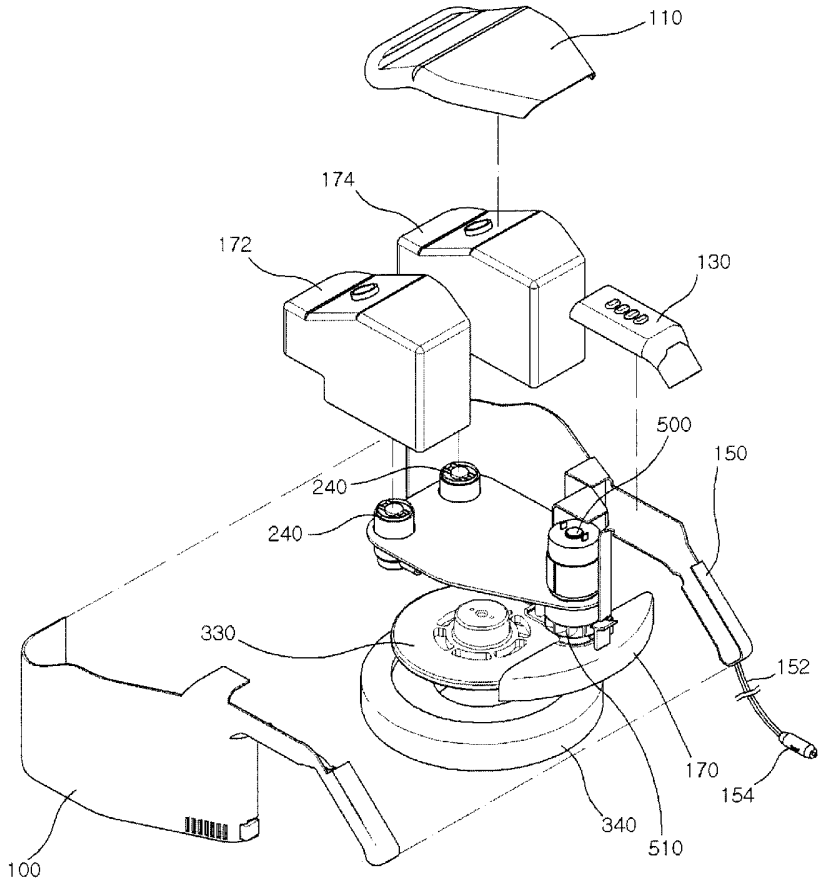
[Fig. 9]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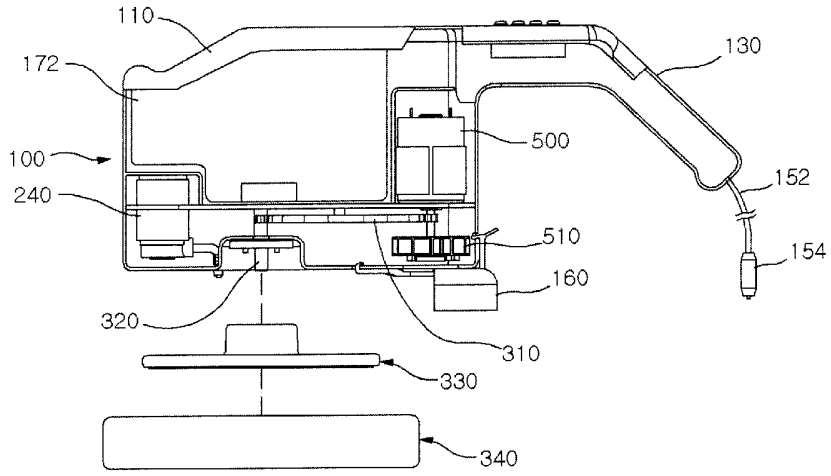
[Fig. 10]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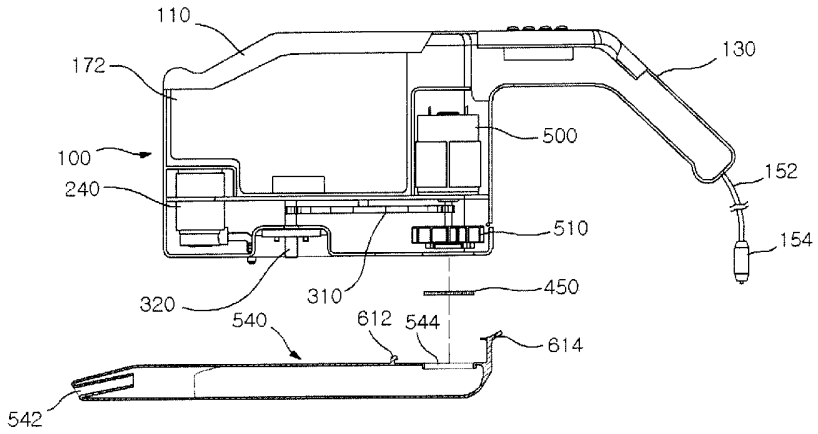
[Fig. 11]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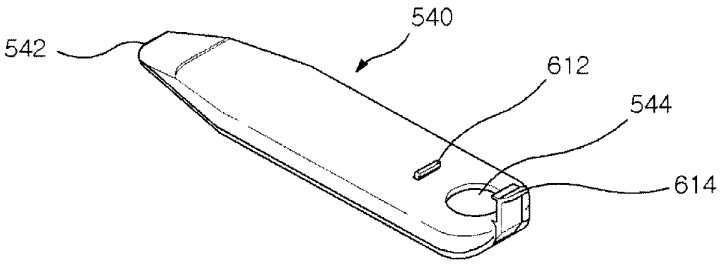
[Fig. 12]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