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(72) Inventors:
• **LIU, Youchen**
Nanjing (CN)
• **LIU, Huan**
Nanjing (CN)
• **ZHANG, Lisong**
Nanjing (CN)

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(74) Representative: **Sun, Yiming**
HUASUN Patent- und Rechtsanwälte
Friedrichstraße 33
80801 München (DE)

(71) Applicant: **Nanjing Chervon Industry Co., Ltd.**
Nanjing, Jiangsu 211106 (CN)

(54) **SANDER**

(57) A sander, includes a housing, the housing including a housing top, a housing bottom and a contraction portion arranged between the housing top and the housing bottom; a base plate assembly, including a base plate; a driving assembly, including a motor, the motor being

used to drive the base plate; and an illumination device, comprising a light-emitting portion. The light-emitting portion is arranged in the housing and located above the contraction portion, and the base plate is within an illumination range of the light-emitting portion.

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Description

RELATED APPLICATION INFORMATION

[0001] This application claims priority to Chinese Patent Application No. CN202311247654.X, filed on Sep. 25, 2023, which application is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present application relates to a power tool, in particular, to a sander.

BACKGROUND

[0003] A sander in the related art is an electric tool for sanding operations. It is often used to sand uneven or unevenly thick walls, desktops, etc. to obtain a surface with a target smoothness. Sanders includes or can be called belt sanders, grinding machine, or polishers. Handheld sanders are an important category of sanders. They are widely used in various industries due to their small size and easy portability.

[0004] When the sanders are used in conditions without sufficient light, a light on the sander will be acted as a supplement or main light source to make the working environment visible.

[0005] This section provides background information related to this application, which is not necessarily prior art.

SUMMARY

[0006] A sander, includes a housing, the housing including a housing top, a housing bottom and a contraction portion arranged between the housing top and the housing bottom; a base plate assembly, including a base plate; a driving assembly, including a motor, the motor being used to drive the base plate; and an illumination device, comprising a light-emitting portion. The light-emitting portion is arranged in the housing and located above the contraction portion, and the base plate is within an illumination range of the light-emitting portion.

[0007] In one embodiment, the light-emitting portion is arranged at the junction of the contraction portion and the housing top.

[0008] In one embodiment, the illumination device is detachably arranged relative to the housing.

[0009] In one embodiment, the light-emitting portion is one of or at least two of a point light source, an area light source, and an LED light source.

[0010] In one embodiment, the illumination device can be turned on when the electric motor is turned on, and the illumination device can be turned off in a preset time when the motor stops rotating.

[0011] In one embodiment, the light-emitting part can emit light of at least two colors.

[0012] In one embodiment, the illumination device is configured to adjust the brightness of the light-emitting portion according to ambient brightness.

[0013] In one embodiment, the illumination device can provide at least one of safety indication, fault indication, battery pack power reminder or projected image.

[0014] In one embodiment, the illumination device also includes a switch component, and the switch component can: open and close the light-emitting portion, and/or adjust the brightness of the light-emitting portion, and/or select the light color of the light-emitting portion, and/or trigger the light-emitting portion to project, and/or select the light mode of the light-emitting portion.

[0015] In one embodiment, the illumination device is configured to transmit a control signal to a user terminal to adjust the light-emitting parameters of the light-emitting portion.

[0016] In one embodiment, an overall height of the sander is less than or equal to 120 mm.

[0017] In one embodiment, overall height of the sander is less than or equal to 110 mm.

[0018] In one embodiment, an overall height of the sander is less than or equal to 100 mm.

[0019] In one embodiment, further comprising a dust channel, which is arranged in the housing, and the dust channel includes a dust inlet and a dust outlet, dust is collected from the base plate and flows into the dust channel through the dust inlet, and then flows into the dust collecting device through the dust outlet, the dust collecting device is provided with the light-emitting portion, and the dust collecting device and the contraction portion are provided with different light-emitting portions.

[0020] In one embodiment, the dust collecting device can be detachably mounted to the housing.

BRIEF DESCRIPTION OF DRAWINGS

[0021]

FIG. 1 is a schematic structural diagram of a sander provided by this application;

FIG. 2 is a schematic diagram 1 of the exploded structure of a sander provided by this application;

FIG. 3 is a schematic diagram 2 of the exploded structure of a sander provided by this application;

FIG. 4 is a schematic diagram 3 of the exploded structure of a sander provided by this application;

FIG. 5 is a partial structural schematic diagram of a sander provided by this application;

FIG. 6 is a partial structural front view of a sander provided by this application;

FIG. 7 is a partial structural top view of a sander

provided by this application;

FIG. 8 is a schematic structural diagram of a dust collection device and filter provided by this application;

FIG. 9 is a schematic diagram of the exploded structure of a dust collecting device and filter provided by this application;

FIG. 10 is a schematic structural diagram of a dust collecting device provided by this application;

FIG. 11 is a front view of a dust collecting device provided by this application;

FIG. 12 is a schematic structural diagram of another dust collection device provided by this application;

FIG. 13 is a front view of another dust collecting device provided by this application;

FIG. 14 is a schematic structural diagram of yet another dust collection device provided by this application;

FIG. 15 is a partial structural schematic diagram of yet another dust collection device provided by this application;

FIG. 16 is a cross-sectional view of yet another dust collecting device provided by the present application;

FIG. 17 is a partial structural schematic diagram 2 of yet another dust collection device provided by this application;

FIG. 18 is a partial structural schematic diagram 3 of yet another dust collecting device provided by this application;

FIG. 19 is a front view of another sander provided by this application;

FIG. 20 is a side view of another sander provided by the present application; and

FIG. 21 is a schematic structural diagram of yet another sander provided by this application.

DETAILED DESCRIPTION

[0022] Before any examples of this application are explained in detail, it is to be understood that this application is not limited to its application to the structural details and the arrangement of components set forth in the following description or illustrated in the above drawings.

[0023] In this application, the terms "comprising", "including", "having" or any other variation thereof are intended to cover an inclusive inclusion such that a process, method, article or device comprising a series of elements includes not only those series of elements, but also other elements not expressly listed, or elements inherent in the process, method, article, or device. Without further limitations, an element defined by the phrase "comprising a ..." does not preclude the presence of additional identical elements in the process, method, article, or device comprising that element.

[0024] In this application, the term "and/or" is a kind of association relationship describing the relationship between associated objects, which means that there can be three kinds of relationships. For example, A and/or B can indicate that A exists alone, A and B exist simultaneously, and B exists alone. In addition, the character "/" in this application generally indicates that the contextual associated objects belong to an "and/or" relationship.

[0025] In this application, the terms "connection", "combination", "coupling" and "installation" may be direct connection, combination, coupling or installation, and may also be indirect connection, combination, coupling or installation. Among them, for example, direct connection means that two members or assemblies are connected together without intermediaries, and indirect connection means that two members or assemblies are respectively connected with at least one intermediate members and the two members or assemblies are connected by the at least one intermediate members. In addition, "connection" and "coupling" are not limited to physical or mechanical connections or couplings, and may include electrical connections or couplings.

[0026] In this application, it is to be understood by those skilled in the art that a relative term (such as "about", "approximately", and "substantially") used in conjunction with quantity or condition includes a stated value and has a meaning dictated by the context. For example, the relative term includes at least a degree of error associated with the measurement of a particular value, a tolerance caused by manufacturing, assembly, and use associated with the particular value, and the like. Such relative term should also be considered as disclosing the range defined by the absolute values of the two end-points. The relative term may refer to plus or minus of a certain percentage (such as 1%, 5%, 10%, or more) of an indicated value. A value that did not use the relative term should also be disclosed as a particular value with a tolerance. In addition, "substantially" when expressing a relative angular position relationship (for example, substantially parallel, substantially perpendicular), may refer to adding or subtracting a certain degree (such as 1 degree, 5 degrees, 10 degrees or more) to the indicated angle.

[0027] In this application, those skilled in the art will understand that a function performed by an assembly may be performed by one assembly, multiple assemblies, one member, or multiple members. Likewise, a

function performed by a member may be performed by one member, an assembly, or a combination of members.

[0028] In this application, the terms "up", "down", "left", "right", "front", and "rear" and other directional words are described based on the orientation or positional relationship shown in the drawings, and should not be understood as limitations to the examples of this application. In addition, in this context, it also needs to be understood that when it is mentioned that an element is connected "above" or "under" another element, it can not only be directly connected "above" or "under" the other element, but can also be indirectly connected "above" or "under" the other element through an intermediate element. It should also be understood that orientation words such as upper side, lower side, left side, right side, front side, and rear side do not only represent perfect orientations, but can also be understood as lateral orientations. For example, lower side may include directly below, bottom left, bottom right, front bottom, and rear bottom.

[0029] As shown in FIGS. 1 to 7, a sander 200 includes a housing 210, a base plate assembly 220, a drive assembly 230, a main switch assembly 240, a dust collection device 251, and an energy source 260. The energy source 260 is used for supplying energy to the sander 200. The energy source 260 may be alternating current power or direct current power such as the battery pack or another portable mobile power supply. The dust collection device 251 may be a dust collection bag or a dust collection box; or the sander 200 may be connected to a vacuum cleaner, and the vacuum cleaner serves as the dust collection device 251. In this example, the case where the dust collection device 251 is the dust collection box is used as an example so that the dust collection device 251 is in the shape of a box, thereby further enhancing the integrity between the dust collection device 251 and the housing 210.

[0030] The dust collection device 251 may be detachably mounted onto the housing 210 so that it is convenient to dump the dust in the dust collection device 251. The dust collection device 251 has an assembly state in which the dust collection device 251 is assembled with the housing 210 and a disassembly state in which the dust collection device 251 is separated from the housing 210. When the dust collection device 251 is in the assembly state, the housing 210 and the dust collection device 251 together form the outer shape of the sander 200 so that the integrity is strong, and it is convenient for usage, storage, and transportation. In order that the dust collection device 251 and the housing 210 are integrated, the dust collection device 251 may be arc-shaped such that when the dust collection device 251 is in the assembly state, the top surface, the bottom surface, and the inner side surface of the dust collection device 251 basically fit the housing 210. An approximately arc-shaped polyline shape formed by splicing multiple straight lines is also considered to be the same as the technical concept of the present application and is also covered by the scope of the present application.

[0031] The housing 210 and/or the dust collection device 251 are formed with a grip 211 for the user to hold. The main switch assembly 240 is disposed on the front side of the housing 210 and the grip 211 so that the user can relatively conveniently trigger the main switch assembly 240 when holding the grip 211. An accommodation portion is formed on the rear side of the housing 210 and used for mounting the energy source 260 such as the battery pack.

[0032] The base plate assembly 220 is disposed at the bottom of the housing 210, and the drive assembly 230 is disposed in the housing 210. The base plate assembly 220 includes a base plate 223 connected to a work accessory; the drive assembly 230 includes an electric motor 231, and the electric motor 231 is used for driving the base plate 223 so that the base plate 223 and the work accessory swing relative to the housing 210. The base plate 223 includes an upper surface and a lower surface that are opposite. The lower surface is used for mounting the work accessory. The work accessory may be the functional element such as the sandpaper. When the base plate 223 moves eccentrically, the surface of a workpiece to be sanded can be continuously rubbed with the sandpaper, thereby implementing the function of sanding and polishing the workpiece to be sanded.

[0033] The sander 200 further includes a dust channel 212. The dust channel 212 is disposed in the housing 210. Dust is collected from the base plate 223, flows into the dust channel 212, and then flows into the dust collection device 251 through the dust channel 212. Specifically, the base plate 223 is provided with a through hole penetrating the upper surface and the lower surface, and dust enters the dust channel 212 through the through hole.

[0034] The electric motor 231 includes a motor shaft for outputting power, and the motor shaft rotates about a motor axis. In this example, the motor axis extends basically along the up and down direction. The sander 200 further includes an airflow element 234 drivable by the electric motor 231. The airflow element 234 is drivable by the electric motor 231 to rotate about the central axis. When rotating, the airflow element 234 can generate the airflow, and the airflow drives dust such that the dust is collected from the base plate 223, flows into the dust channel 212, and then flows into the dust collection device 251 through the dust channel 212.

[0035] The housing 210 is further provided with a control panel 232 and a speed regulation assembly 233. The control panel 232 is electrically connected to the electric motor 231. The speed regulation assembly 233 is electrically connected to the control panel 232. The speed regulation assembly 233 can control the rotational speed of the electric motor 231. The speed regulation assembly 233 can be controlled by a speed regulation button on the housing 210.

[0036] The dust channel 212 includes a dust inlet 221 and a dust outlet 222. The dust channel 212 has an upper sidewall and a lower sidewall along the up and down

direction, where the distance from the upper sidewall to the lower sidewall gradually increases along a preset direction of rotation 205. It is to be understood that the sucked dust flows from the dust inlet 221 to the dust outlet 222. In the vertical direction, the dust outlet 222 is higher than the dust inlet 221; the base plate 223 extends in a first plane, and the projection of the dust channel 212 on the first plane is basically arc-shaped so that the resistance to dust flow is reduced and smooth dust collection is achieved. In addition, since the resistance to dust collection is reduced, the energy consumption of the sander is reduced. It is to be noted that the arc shape involved in the present application may be an arc along the internal contour of the housing or may be a curve or another non-circular arc such as an involute.

[0037] In this example, when the sander 200 is in the load-free state, the working duration of the sander 200 when the battery pack consumes 10 WH of energy is defined as the functional time T of the sander 200, and the product of the load-free rotational speed N of the electric motor 231 and the functional time T of the sander 200 is greater than or equal to 63000 rpm·min and less than or equal to 120000 rpm·min. In an example, the product of the load-free rotational speed N of the electric motor 231 and the functional time T of the sander 200 is greater than or equal to 70000 rpm·min and less than or equal to 115000 rpm·min. In other examples, the product of the load-free rotational speed N of the electric motor 231 and the functional time T of the sander 200 is greater than or equal to 77000 rpm·min and less than or equal to 110000 rpm·min. In this example, the functional time T of the sander 200 is greater than or equal to 7 min and less than or equal to 11 min.

[0038] For the dust channel 212, the smaller the height difference between the dust outlet 222 and the dust inlet 221, the smaller the resistance to air flow. However, the dust outlet 222 connects with the dust collection device 251; the higher the dust outlet 222 is, the less likely the dust collection device 251 is blocked by dust. The height difference H1 in the vertical direction between the dust outlet 222 and the dust inlet 221 is greater than or equal to 9 mm and less than or equal to 41 mm. In some examples, the height difference H1 in the vertical direction between the dust outlet 222 and the dust inlet 221 is greater than or equal to 15 mm and less than or equal to 30 mm. In some examples, the height difference H1 in the vertical direction between the dust outlet 222 and the dust inlet 221 is 27 mm.

[0039] The included angle formed between a line between the dust inlet 221 and the center point of the base plate 223 and a line between the dust outlet 222 and the center point of the base plate 223 is a first angle β , and the first angle β is greater than or equal to 60 degrees and less than or equal to 120 degrees so that the resistance of the airflow in the dust channel 212 is reduced. In some examples, the first angle β is greater than or equal to 80 degrees and less than or equal to 100 degrees. In some examples, the first angle β is equal to 60 degrees, 70

degrees, 80 degrees, 90 degrees, 100 degrees, 110 degrees, or 120 degrees. In an example, the dust inlet 221 and the dust outlet 222 of the dust channel 212 are both located in the housing 210. In an example, the projection of the dust outlet 222 of the dust channel 212 on the first plane does not extend beyond the boundary range of the base plate 223. In an example, the base plate 223 is basically rectangular, and the center point of the base plate 223 is the center point of the rectangular surface.

[0040] In some examples, the dust channel 212 extends in a spiral shape between the dust inlet 221 and the dust outlet 222 so that the dust channel 212 rises gently and the airflow resistance is reduced. In some examples, the dust channel 212 extends in a straight line between the dust inlet 221 and the dust outlet 222.

[0041] The projection of the dust channel 212 on the first plane is a first projection, and the first projection is completely located within the boundary of the base plate 223 so that the structure is compact and the center of gravity is stable. The projection of the dust collection device 251 on the first plane is a second projection, and the second projection is completely located within the boundary of the base plate 223 so that the structure is compact and the center of gravity is stable. The first projection may overlap the second projection. The area of the second projection is greater than half of the area of the base plate 223.

[0042] A first electrostatic conductive assembly is disposed on the dust collection device 251 and used for conducting static electricity from the dust collection device. The first electrostatic conductive assembly may be a metal sheet such as a copper sheet.

[0043] The sander 200 further includes a second electrostatic conductive assembly. The second electrostatic conductive assembly includes a first conductive member and a second conductive member. Two ends of the first conductive member are separately connected to the dust channel 212 and the stator core of the electric motor 231. Two ends of the second conductive member are separately connected to the stator core and the housing 210. Since the human hand holds the housing 210, the static electricity on the dust channel 212 is conducted by the human hand through the second electrostatic conductive assembly.

[0044] As shown in FIGS. 8 and 9, the dust collection device 251 has a dust collection cavity 252, an air inlet 253, and an air outlet 254, where the air inlet 253 and the air outlet 254 connect with the dust collection cavity 252. The air inlet 253 connects with the dust outlet 222 of the dust channel 212. Therefore, the dust can enter the dust collection device 251 from the dust channel 212, and the air outlet 254 connects with the outside; after the airflow carrying dust enters the dust collection device 251, the dust falls into the dust collection cavity 252 under the action of the gravity, and the airflow flows out from the air outlet 254.

[0045] The air inlet 253 connects with the dust outlet

222 of the dust channel 212. The area of the air inlet 253 is less than or equal to 400 mm², ensuring sufficient intake air volume under the premise of fully utilizing the space. In some examples, the area of the air inlet 253 is less than or equal to 350 mm². In some examples, the area of the air inlet 253 is less than or equal to 300 mm². In some examples, the area of the air inlet 253 is equal to 250 mm², 260 mm², or 270 mm².

[0046] A filter 257 is disposed at the air outlet 254 of the dust collection device 251. If a small amount of dust flows out of the air outlet 254 with the airflow, the filter 257 can filter the dust to prevent the dust from overflowing. The filter 257 includes a holder 258 and filter paper 259. The filter paper 259 is mounted on the holder 258. The holder 258 is detachably connected to the air outlet 254. The filter paper 259 is supported by the holder 258. The holder 258 is easy to mount and disassemble. When the filter paper 259 is replaced, the holder 258 may be disassembled. After the filter paper 259 is replaced, the holder 258 is mounted again. The holder 258 may engage with the dust collection device 251 in a snap-fit manner.

[0047] As shown in FIG. 10, one air outlet 254 is provided and located at the top of the dust collection device 251. As shown in FIG. 11, in the vertical direction, the bottom edge of the air inlet 253 is higher than the bottom surface of the dust collection cavity 252, and the height difference H2 between the bottom edge of the air inlet 253 and the bottom surface of the dust collection cavity 252 is greater than or equal to 5 mm and less than or equal to 20 mm so that the dust in the dust collection cavity 252 is prevented from overflowing from the air inlet 253, the air inlet 253 is prevented from being blocked, the dust collection cavity 252 has a certain space, and the dust collection amount is improved.

[0048] As shown in FIGS. 12 and 13, at least two air outlets 254 are provided so that air permeability and exhaust air volume are increased, and the dust collection is smoother. The air outlets 254 may be disposed on the top or side surface of the dust collection device 251. Specifically, the air outlet 254 is located on a side of the dust collection device 251 facing the housing 210, that is, the air outlet 254 is disposed on the inner side surface of the dust collection device 251 so that the outer surface of the dust collection device 251 is flat.

[0049] Each air outlet 254 is provided with the filter 257, and the filter 257 can filter the dust and prevent the dust from overflowing.

[0050] In a layout where the air outlet 254 is located on the side of the dust collection device 251 facing the housing 210, to facilitate air output, a gap is formed between the dust collection device 251 and the housing 210, and the gap connects the air outlet 254 with the outside. As shown in FIG. 15, the housing 210 includes a first adapting surface 215, and the inner side surface of the dust collection device 251 is a second adapting surface 216. When the dust collection device 251 is assembled with the housing 210, a gap is formed between the first adapting surface 215 and the second adapting

surface 216, thereby facilitating air output at the air outlet 254. The gap has a dimension of 1 mm to 3 mm, preferably, 2 mm.

[0051] As shown in FIG. 2, the housing 210 includes a mounting plate 213. The mounting plate 213 has a first mounting surface 231. The dust collection device 251 is detachably connected to the first mounting surface 231. The first mounting surface 231 is a mirror-finished surface so that the friction during assembly is reduced, thereby facilitating the disassembly and assembly of the dust collection device 251.

[0052] The dust collection device 251 may engage with the housing 210 in a snap-fit manner, specifically, through a ball snap catch 214. The ball snap catch 214 is disposed on the first mounting surface 231. During installation, the dust collection device 251 is pushed to the housing 210 so that the dust collection device 251 slides along the first mounting surface 231 to engage with the ball snap catch 214 in a snap-fit manner. Since the first mounting surface 231 is the mirror-finished surface, the friction during assembly is reduced.

[0053] The mounting plate 213 further includes a second mounting surface 232. The second mounting surface 232 is located on the outer circumference of the first mounting surface 231 and is lower than the first mounting surface 231. The second mounting surface 232 has a rougher surface than the first mounting surface 231. The dust collection device 251 abuts against the second mounting surface 232 so that the contact area and friction between the dust collection device 251 and the housing 210 are increased, and the connection is stable.

[0054] As shown in FIGS. 14 to 18, in an example, the dust collection device 251 has the dust collection cavity 252, a cyclone dust collection assembly 256 is disposed in the dust collection cavity 252, the cyclone dust collection assembly 256 has the air inlet 253, a dust exhaust outlet 250, and the air outlet 254, the air inlet 253 connects with the dust outlet 222, the dust exhaust outlet 250 connects with the dust collection cavity 252, and the air outlet 254 connects with the outside. Due to the arrangement of the cyclone dust collection assembly 256, the air inlet 253 does not need to be higher than the bottom surface of the dust collection cavity 252, and the dust in the dust collection cavity 252 does not overflow from the air inlet 253.

[0055] The working principle of the cyclone dust collection assembly 256 is conventional technology, and the details are not repeated here. The airflow carrying dust rises after entering from the air inlet 253. Under the action of the cyclone dust collection assembly 256, the dust falls from the dust exhaust outlet 250, and the airflow is discharged from the air outlet 254. The air outlet 254 may be disposed on the outer sidewall of the dust collection device 251, so the top of the dust collection device 251 does not need to be opened and can be sealed.

[0056] As shown in FIGS. 19 and 20, the sander 200 further includes an illumination device 270. The housing 210 includes a housing top 202, a housing bottom 203,

and a contraction portion 204 disposed between the housing top 202 and the housing bottom 203. The contraction portion 204 is a section of the housing 210 that contracts inward. In the field of sanders, the contraction portion 204 is often used for users to hold, thereby forming a holding area that is different from the housing top 202 of the housing 210. A transition portion 205 is formed in the process of the contraction portion 204 extending upward to the housing top 202 of the housing. When the user holds the contraction portion 204, the transition portion 205 can be held up by the tiger's mouth of a hand and the fingers can be placed on the housing top 202.

[0057] Nowadays, with the sander 200 being more compact, the height of the sander 200 is getting lower and lower. The demand that the contraction portion 204 and the transition portion 205 to be held is reduced, so that the user can obtain the correct holding position when holding the hand on the housing top 202 of the housing 210, thereby holding the sander 200 firmly. At the same time, the lighting demand of the sander 200 is gradually reflected. The sander 200 of the present application is provided with an illumination device 70 to meet the use demand when the light is insufficient.

[0058] The illumination device 270 includes a light-emitting portion 271. The light-emitting portion 271 is disposed on the housing 210 and located above the contraction portion 204. The base plate 223 is within the illumination range of the light-emitting portion 271. The position of the light-emitting portion 271 is such that the base plate 223 is within the illumination range of the light-emitting portion 271. Since a sanding member on the base plate 223 sands a member to be sanded, during work, the work region is within the illumination range of the light-emitting portion 271, which is convenient for an operator to observe, thereby improving the user experience.

[0059] In some examples, the light-emitting portion 271 is disposed at the junction of the contraction portion 204 and the housing top 202. In this embodiment, the illumination device 70 is below the main switch assembly 240 and is above the contraction portion 204. It is to be understood that the light-emitting portion 271 emits light downward or obliquely downward to illuminate the region where the base plate 223 is located.

[0060] The illumination device 270 is detachably disposed relative to the housing 210, thereby facilitating maintenance. The light-emitting portion 271 and the housing 210 may be connected in a screw connection manner, a snap-fit manner, or a magnetic attraction connection manner.

[0061] In one embodiment, the overall height of the sander 200 is less than or equal to 130 mm. In one embodiment, the overall height of the sander 200 is less than or equal to 120 mm. In one embodiment, the overall height of the sander 200 is less than or equal to 110 mm. In one embodiment, the overall height of the sander 200 is less than or equal to 100 mm. In some embodiments, the overall height of the sander 200 may be 98 mm, 103

mm, 105 mm, 108 mm or 112 mm, etc. The overall height of the sander 200 refers to the distance from the top of the housing top 202 to the bottom of the base plate 223, excluding the distance of the battery pack protruding from the housing top 202. With such a configuration, for the sander with a short overall height, the illumination device 270 disposed in the transition portion 205 will be of space advantage.

[0062] In some examples, the battery pack of the sander 200 supplies electrical energy to the illumination device 270. In some examples, the sander 200 further includes an illumination power supply that supplies power to the illumination device 270, and the illumination power supply is a power supply component independent of the battery pack. Optionally, the illumination power supply may be a battery, a storage battery, or the like that is detachably connected to the sander 200. In some examples, the sander 200 further includes a self-powered module. The self-powered module is a component that can generate power through sunlight. The module that generates power through sunlight is an existing component, so the working principle and detailed structure are not described in detail.

[0063] The light-emitting portion 271 is one or a combination of at least two of a point light source, an area light source, and a light-emitting diode (LED) light source. The light-emitting portion 271 may be annular or rectangular, so as to increase the luminous area.

[0064] One light-emitting portion 271 may be provided, or multiple light-emitting portions 271 may be provided. When multiple light-emitting portions 271 are provided, the light-emitting portions 271 may be located at different positions, and the light-emitting portions 271 may be turned on or off simultaneously or independently. In some examples, the illumination device 270 includes at least two light-emitting portions 271. The at least two light-emitting portions 271 may be turned on separately. Optionally, one of the light-emitting portions 271 may be set to a low-beam mode, and one of the light-emitting portions 271 may be set to a high-beam mode, so as to satisfy different usage requirements. Of course, the two light-emitting portions 271 may be turned on simultaneously so that the illumination device 270 has a higher illumination intensity and a larger illumination range. It is to be noted that the low-beam mode and the high-beam mode are collectively referred to as light emission modes of the light-emitting portion 271. Optionally, different light-emitting portions 271 may be disposed at different positions of the sander 200 so that while illuminating the base plate 223 of the sander 200, the illumination device 270 can illuminate the front, sides, and rear of the sander 200, thereby preventing the user from bumping due to unclear visibility of the surrounding environment.

[0065] The illumination device 270 can be turned on when the electric motor 231 is turned on, and the illumination device 270 can be turned off in a preset time after the electric motor 231 stops rotating. The on and off of the illumination device 270 and the electric motor 231 are

linked so that the illumination device 270 can be turned on and off intelligently, thereby improving the user experience. Optionally, the preset time may be 3s, 5s, 7s, or the like and is not specifically limited here. In some examples, the user may configure the illumination device 270 to select the appropriate preset time.

[0066] The light-emitting portion 271 can emit light of at least two colors. Optionally, the light-emitting portion 271 can emit white light, which has better brightness and is suitable for use in normal weather. The light-emitting portion 271 can emit yellow light, which has strong penetrability and is more suitable for use in foggy days. Optionally, the light-emitting portion 271 can emit red light. During working in complex construction conditions, turning on the red light can serve as a warning to the outside. In other examples, the colors emitted by the light-emitting portion 271 are not limited to the preceding colors. Optionally, the illumination device 270 may include at least two light-emitting portions 271, and each light-emitting portion 271 correspondingly emits light of one color.

[0067] In some examples, the illumination device 270 is configured to be capable of adjusting the light colors of the light-emitting portions 271 according to ambient brightness. The illumination device 270 may be provided with a light sensor. When the light sensor recognizes that the ambient brightness decreases to a first threshold, the light-emitting portion 271 switches from a first color to a second color.

[0068] The illumination device 270 is configured to be capable of adjusting the brightness of the light-emitting portions 271 according to the ambient brightness. In some examples, the illumination device 270 may be provided with the light sensor. When the light sensor recognizes that the ambient brightness decreases to the first threshold, the light-emitting portions 271 automatically light up. In some examples, when the light sensor recognizes that the ambient brightness increases to a second threshold, the brightness of the light-emitting portions 271 is automatically adjusted to darker.

[0069] In some examples, the light-emitting portions 271 have at least two brightnesses. When the user presses the button for the first time, the light-emitting portions 271 emit light of the first brightness. When the user presses the button for the second time, the light-emitting portions 271 emit light of the second brightness. When the user presses the button for the third time, the light-emitting portions 271 are turned off.

[0070] The illumination device 270 can perform at least one of a safety indication, a fault indication, a battery pack power reminder, or a projected image. Optionally, the light-emitting portions 271 can flash at different frequencies and indicate the safety indication, the fault indication, and the power reminder at different strobe frequencies. It is to be understood that the light-emitting portions 271 can emit light of different colors to separately indicate the safety indication, the fault indication, and the power reminder. Optionally, the light-emitting portions 271 can

project an image, and the image may be a brand logo or a model of the product, thereby achieving a certain publicity effect.

[0071] The illumination device 270 further includes a switch assembly, where the switch assembly can turn on and off the light-emitting portions 271, and/or adjust the brightness of the light-emitting portions 271, and/or select emitted colors of the light-emitting portions 271, and/or trigger the light-emitting portions 271 to project an image, and/or select the light emission modes of the light-emitting portions 271. In an example, the maximum distance between the switch assembly and the light-emitting portion 271 is less than or equal to 5 cm so that the length of the cable between the switch assembly and the light-emitting portion 271 can be shortened, and the cables inside the sander 200 are neat and are not easily damaged. The switch assembly may be located above the grip 211 for easy operation.

[0072] In some examples, the illumination device 270 is configured to be capable of transmitting control signals to and from a user terminal to adjust luminescence parameters of the light-emitting portions 271. Specifically, the illumination device 270 further includes a communication module. The user may communicate with the communication module through a terminal device such as a mobile phone to control the light-emitting portions 271. Optionally, the communication module may be a Bluetooth module, a Wi-Fi module, or the like. The luminescence parameters include, but are not limited to, turning on and off the light-emitting portions 271, adjusting the brightness of the light-emitting portions 271, selecting the emitted colors of the light-emitting portions 271, triggering the light-emitting portions 271 to project an image, selecting the light emission modes of the light-emitting portions 271, and adjusting the strobe frequencies of the light-emitting portions 271. The user terminal may be a portable terminal such as a tablet or a mobile phone, so as to adjust the luminescence parameters of the light-emitting portions 271 easily.

[0073] In the scheme of the illumination device 270 disclosed in Figures 19 and 20, the light-emitting portion 271 can protrude from an outer surface of the housing 210, or can be embedded in the interior of the housing 210 so as to be substantially flush with the outer surface of the housing 210, or can be slightly lower than the outer surface of the housing 210.

[0074] As shown in FIG. 21, in the case where the sander 200 includes the dust collection device 251, the illumination device 270 includes the light-emitting portions 271, and the light-emitting portions 271 are disposed on the dust collection device 251, so as to make full use of the space of the dust collection device 251. Since the outer circumferential surface of the dust collection device 251 has a larger dimension, the light-emitting portions 271 disposed on the dust collection device 251 are less likely to be blocked. For the specific structure of the dust collection device 251, reference may be made to the relevant content of the preceding dust collection

device 251. For the specific structures of the light-emitting portions 271, reference may be made to the relevant content of the preceding light-emitting portions 271.

[0075] In some examples, the light-emitting portions 271 are arranged around the circumferential direction of the dust collection device 251 so that the light has a larger coverage area, the illumination range is increased, and the light uniformity is ensured.

[0076] In some examples, the light-emitting portions 271 are disposed inside and/or outside the dust collection device 251. The light-emitting portions 271 may be disposed on the outer circumferential surface of the dust collection device 251, on the inner circumferential surface of the dust collection device 251, or on both the outer circumferential surface and the inner circumferential surface of the dust collection device 251.

[0077] In some examples, some light-emitting portions 271 are disposed on the dust collection device 251, and some light-emitting portions 271 are disposed on the housing 210.

[0078] In some examples, the dust collection device 251 is detachably connected to the housing 210, and the dust collection device 251 has the assembly state in which the dust collection device 251 is assembled with the housing 210. When the dust collection device 251 is in the assembly state, the illumination device 270 is turned on. The state of the dust collection device 251 is linked to the on and off of the illumination device 270 so that the illumination device 270 can be turned on intelligently, thereby improving the user experience. The dust collection device 251 has the disassembly state in which the dust collection device 251 is separated from the housing 210. In some examples, when the dust collection device 251 is in the disassembly state, the illumination device 270 is turned off.

[0079] In some embodiments, the contraction portion 204 and the dust collecting device 251 may be separately provided with different illumination devices 270, or different light emitting portions 271.

[0080] The above illustrates and describes the basic principles, main features, and advantages of the present invention. It is to be understood by those skilled in the art that the preceding examples do not limit the present invention in any form, and technical solutions obtained by means of equivalent substitution or equivalent transformation fall within the scope of the present invention.

Claims

1. A sander, comprising:

A housing, the housing comprising a housing top, a housing bottom and a contraction portion arranged between the housing top and the housing bottom;

A base plate assembly, comprising a base plate;

A driving assembly, comprising a motor, the

motor being used to drive the base plate;

An illumination device, comprising a light-emitting portion;

Characterized in that the light-emitting portion is arranged in the housing and located above the contraction portion, and the base plate is within an illumination range of the light-emitting portion.

2. The sander according to claim 1, **characterized in that** the light-emitting portion is arranged at the junction of the contraction portion and the housing top.

3. The sander according to claim 1, **characterized in that** the illumination device is detachably arranged relative to the housing.

4. The sander according to claim 1, **characterized in that** the light-emitting portion is one of or at least two of a point light source, an area light source, and an LED light source.

5. The sander according to claim 1, **characterized in that** the illumination device can be turned on when the electric motor is turned on, and the illumination device can be turned off in a preset time when the motor stops rotating.

6. The sander according to claim 1, **characterized in that** the light-emitting part can emit light of at least two colors.

7. The sander according to claim 1, **characterized in that** the illumination device is configured to adjust the brightness of the light-emitting portion according to ambient brightness.

8. The sander according to claim 1, **characterized in that** the illumination device can provide at least one of safety indication, fault indication, battery pack power reminder or projected image.

9. The sander according to claim 1, **characterized in that** the illumination device also includes a switch component, and the switch component can: open and close the light-emitting portion, and/or adjust the brightness of the light-emitting portion, and/or select the light color of the light-emitting portion, and/or trigger the light-emitting portion to project, and/or select the light mode of the light-emitting portion.

10. The sander according to claim 1, **characterized in that** the illumination device is configured to transmit a control signal to a user terminal to adjust the light-emitting parameters of the light-emitting portion.

11. The sander according to claim 1, **characterized in**

that an overall height of the sander is less than or equal to 120 mm.

12. The sander according to claim 1, **characterized in that** an overall height of the sander is less than or equal to 110 mm. 5
13. The sander according to claim 1, **characterized in that** an overall height of the sander is less than or equal to 100 mm. 10
14. The sander according to claim 1, **characterized in that** further comprising a dust channel, which is arranged in the housing, and the dust channel includes a dust inlet and a dust outlet, dust is collected from the base plate and flows into the dust channel through the dust inlet, and then flows into the dust collecting device through the dust outlet, the dust collecting device is provided with the light-emitting portion, and the dust collecting device and the contraction portion are provided with different light-emitting portions. 15 20
15. The sander according to claim 14, **characterized in that** the dust collecting device can be detachably mounted to the housing. 25

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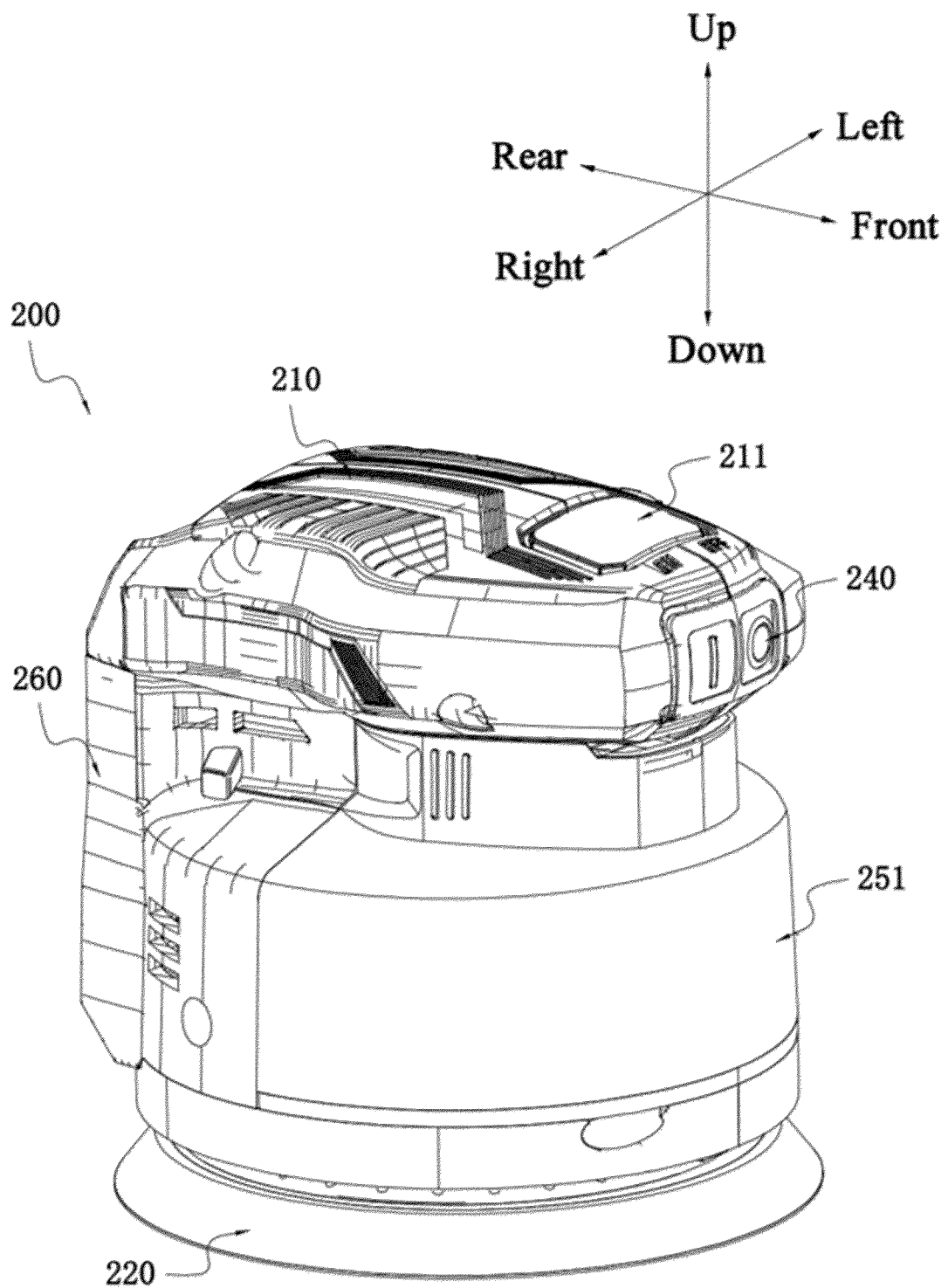


FIG. 1

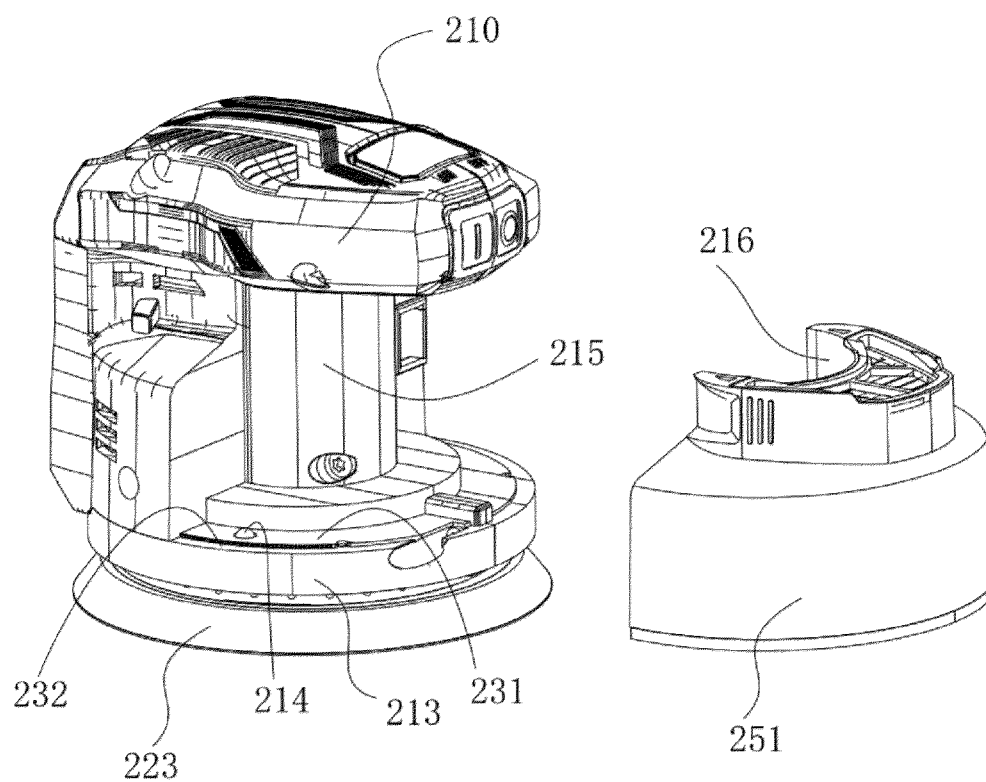


FIG. 2

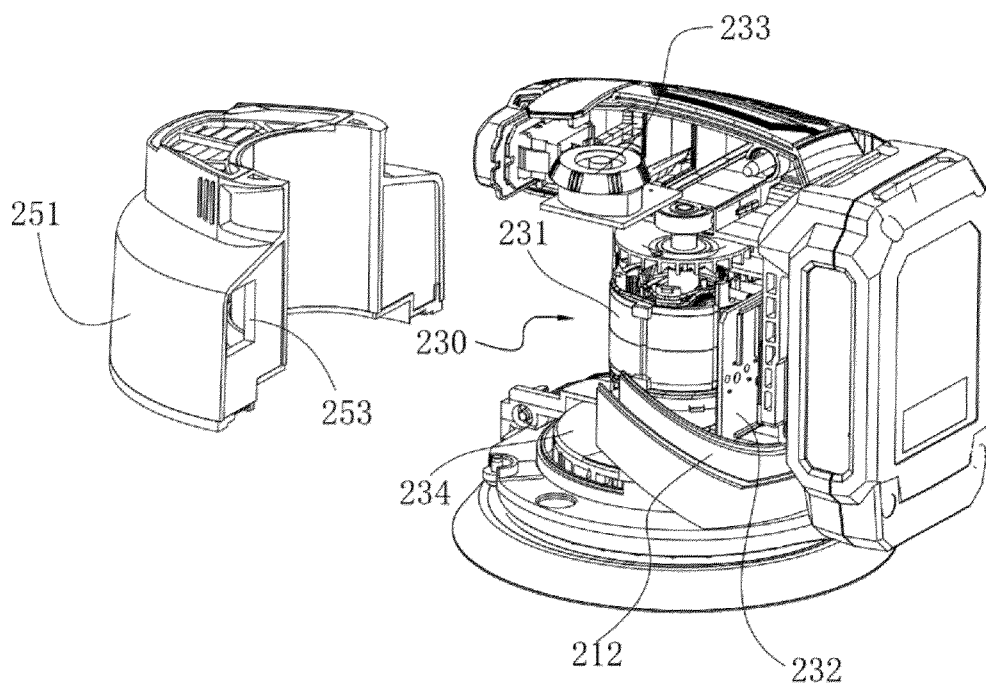


FIG. 3

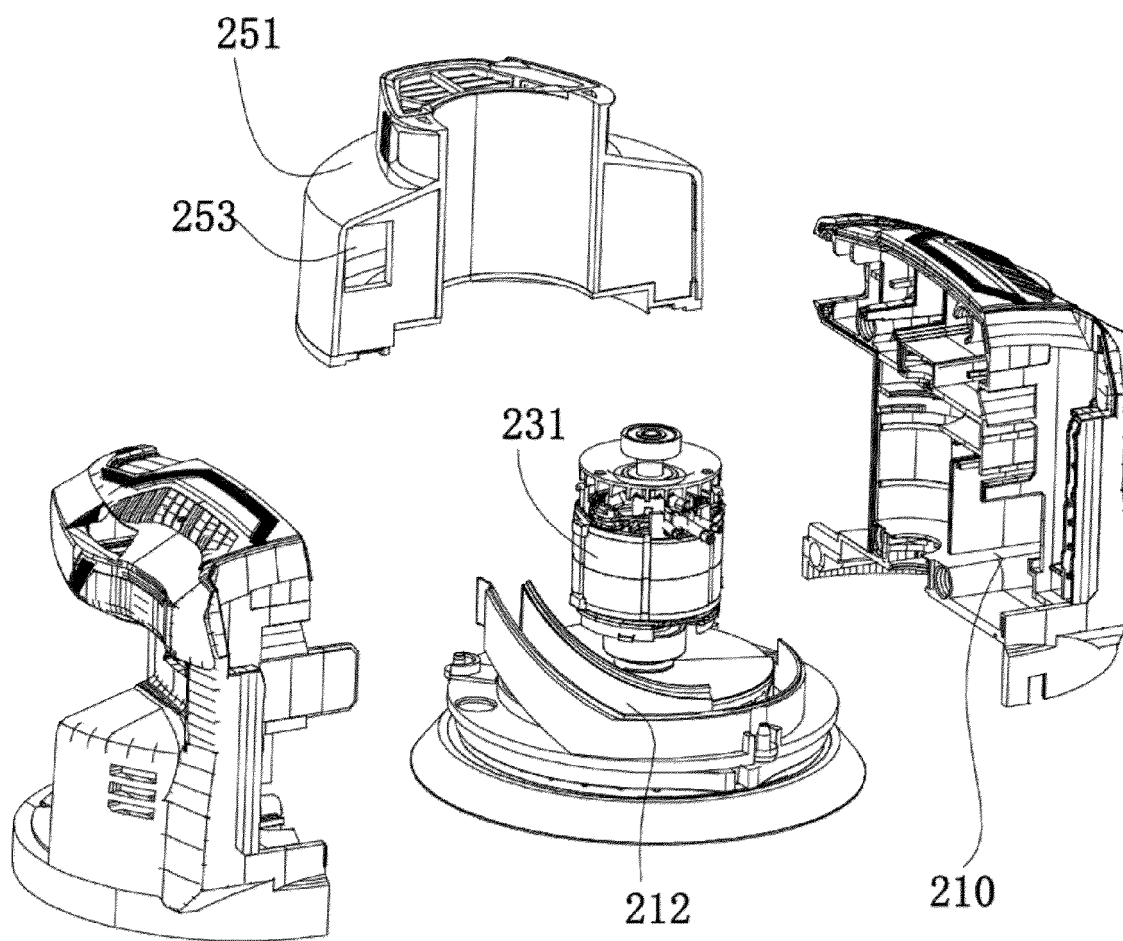


FIG. 4

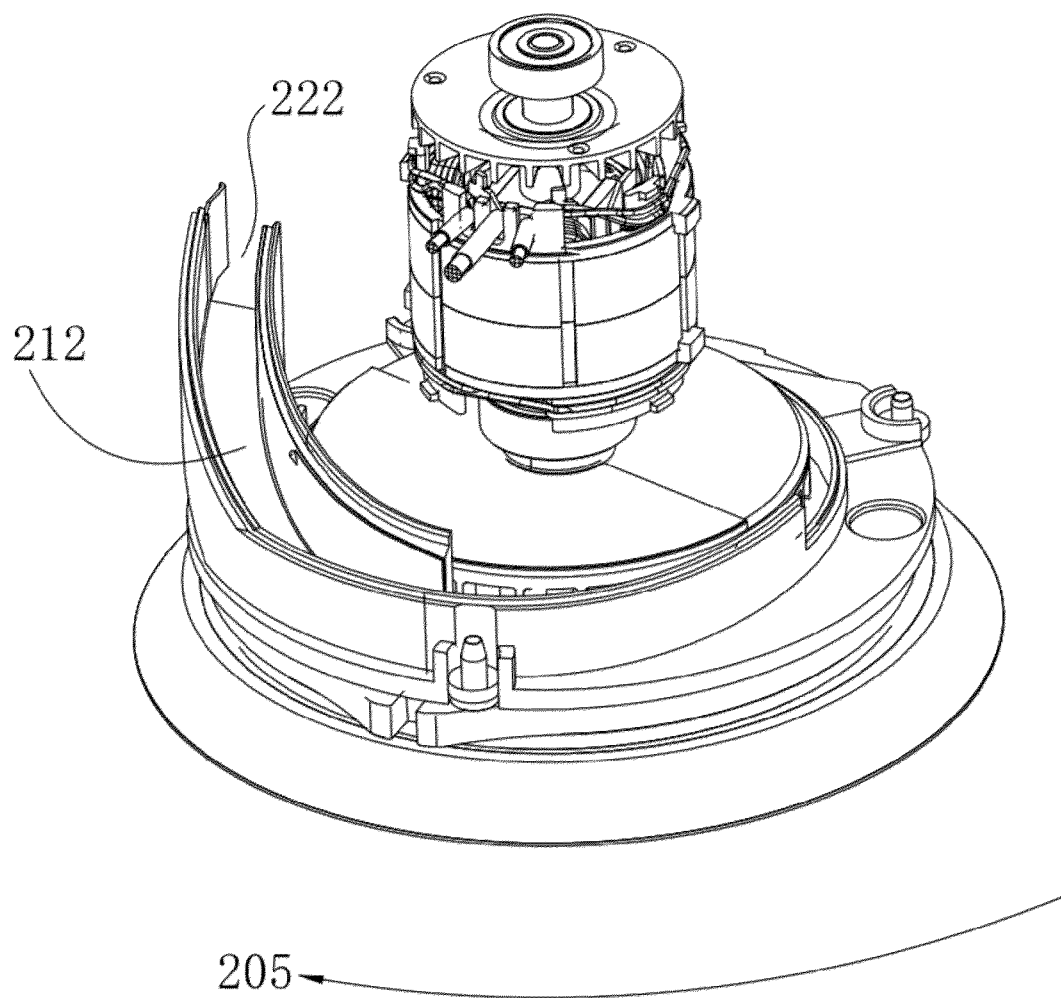


FIG. 5

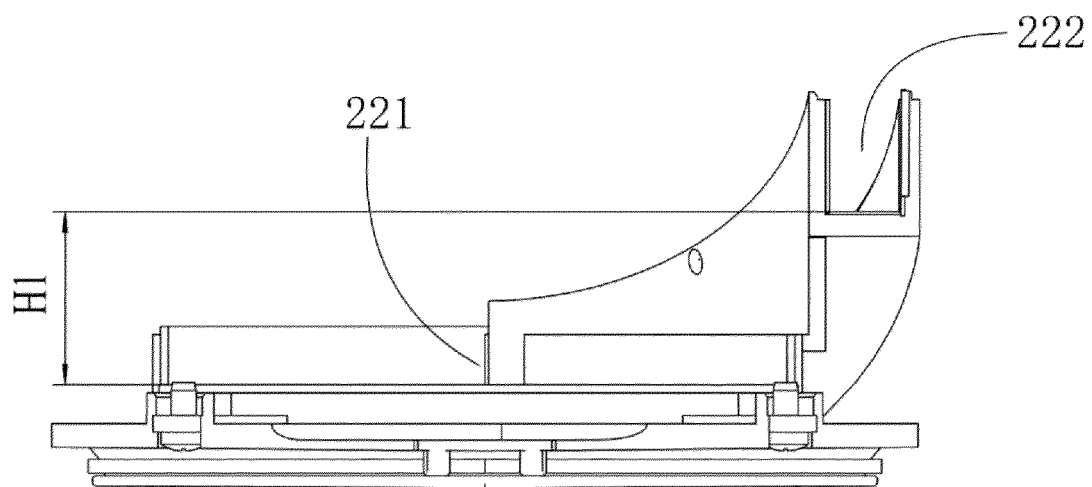


FIG. 6

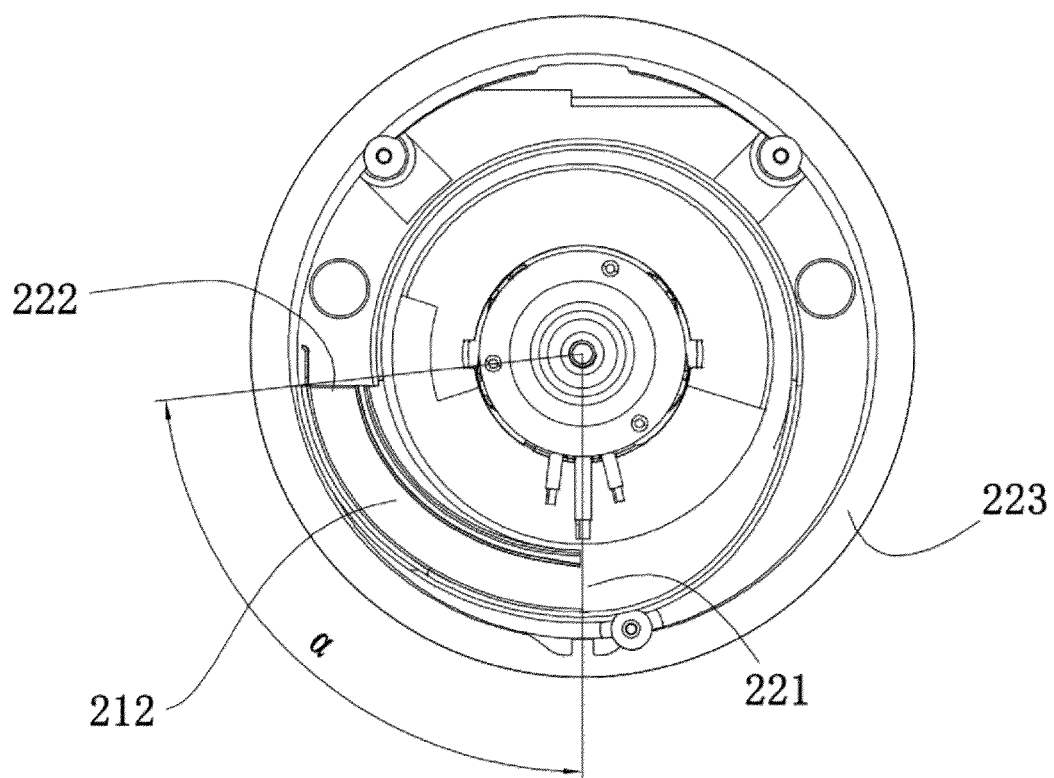


FIG. 7

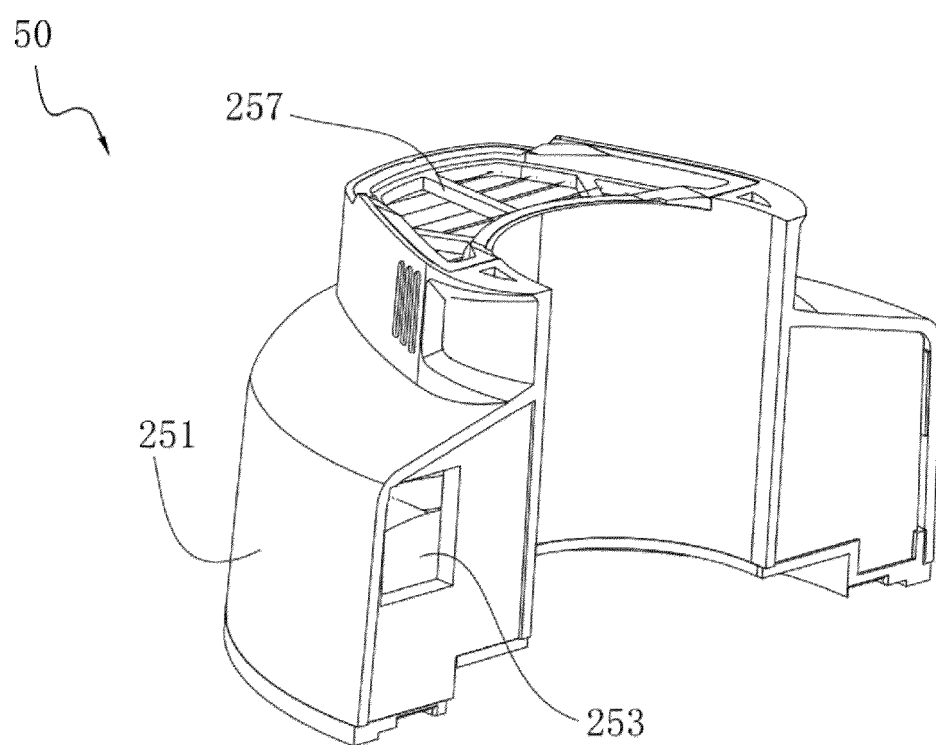


FIG. 8

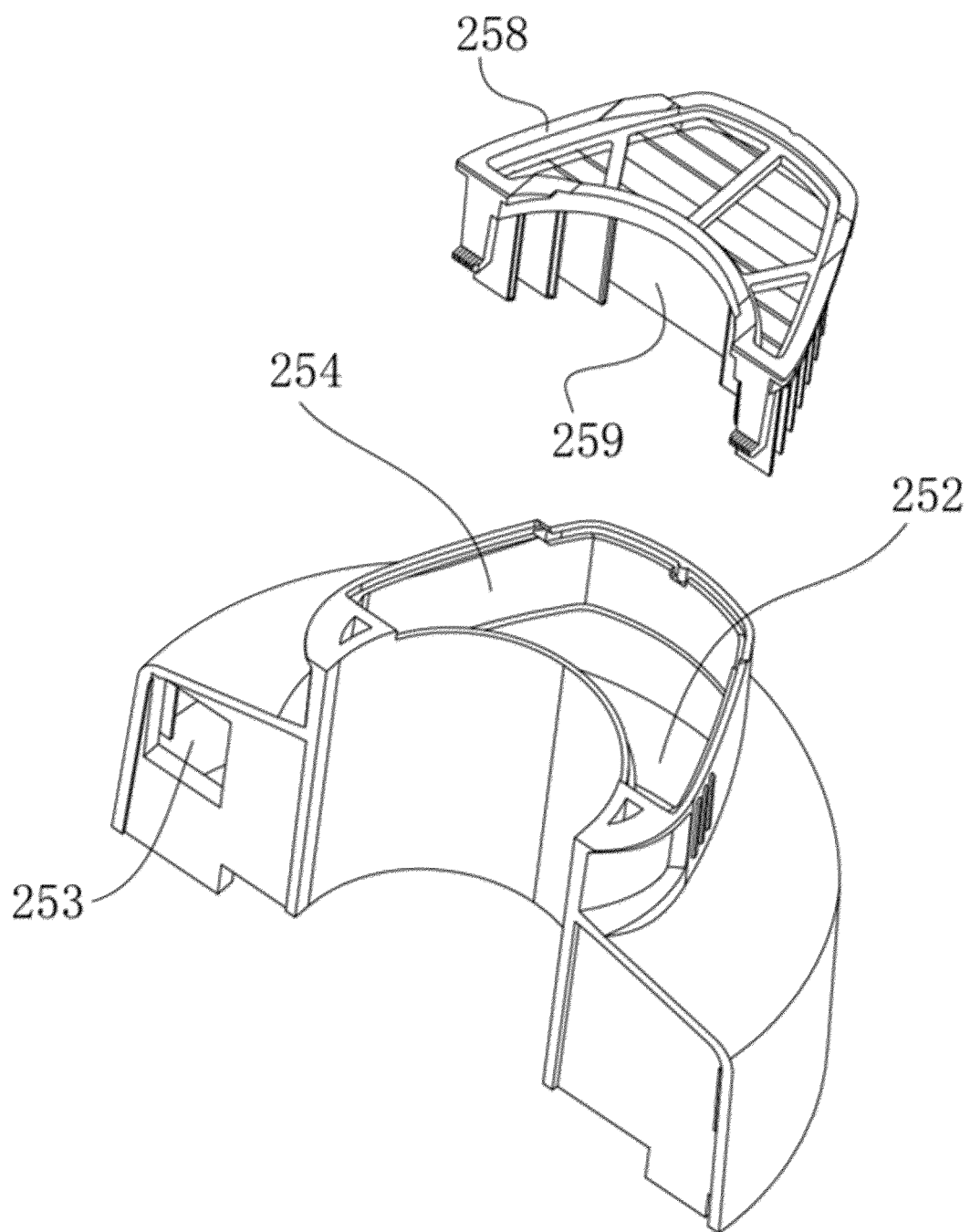


FIG. 9

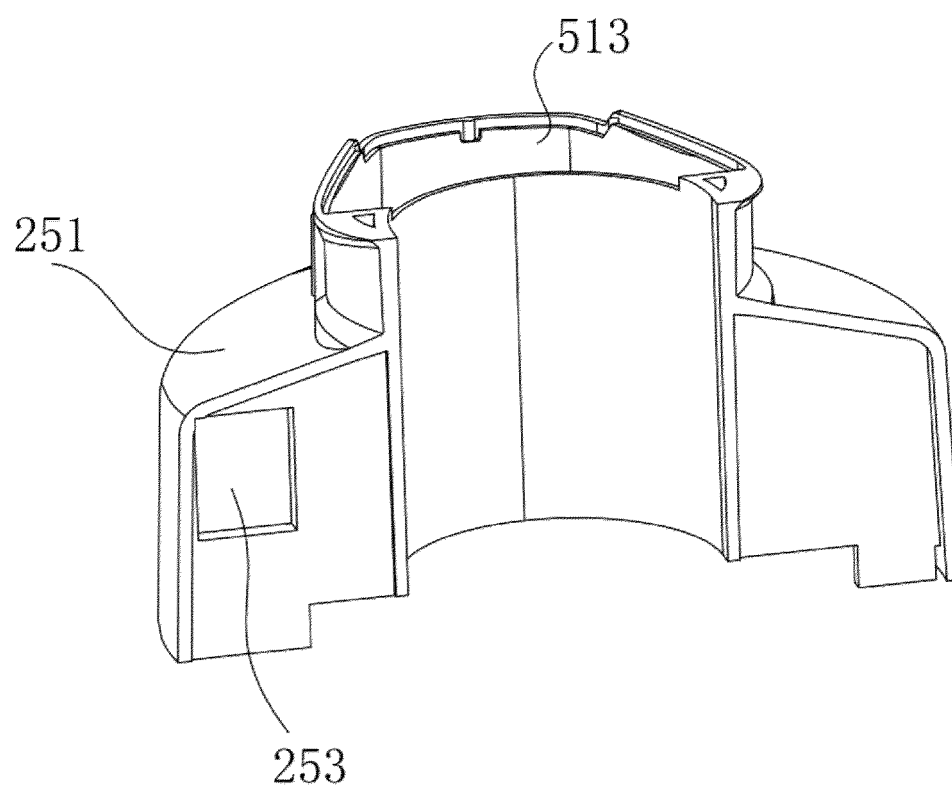


FIG. 10

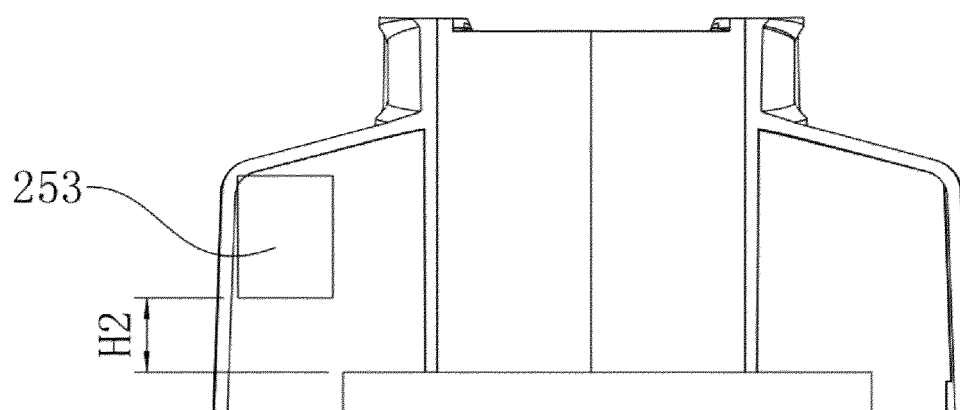


FIG. 11

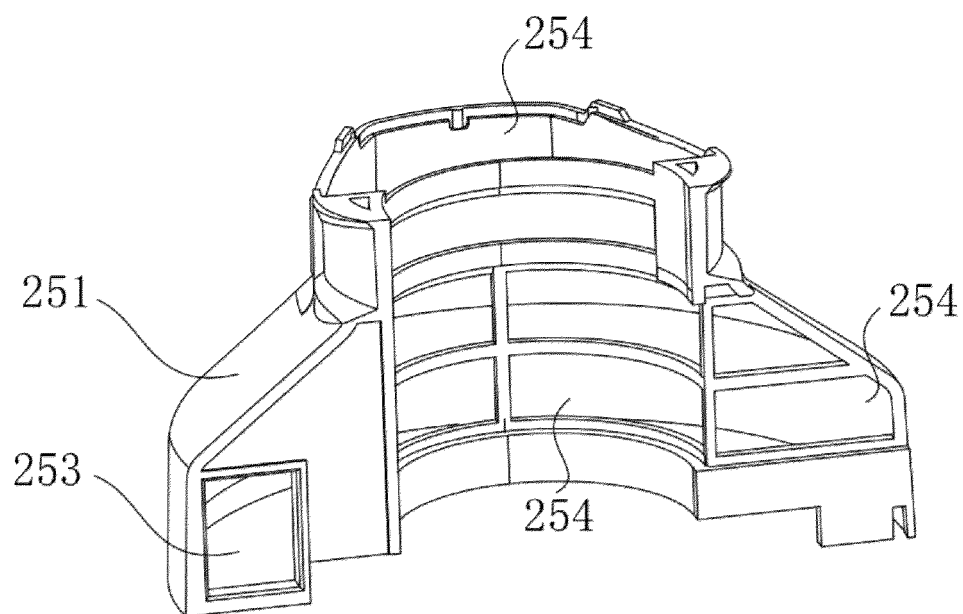


FIG. 12

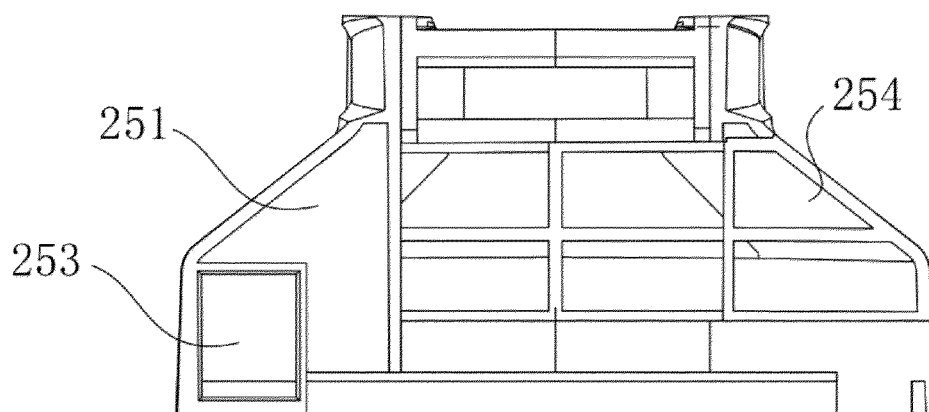


FIG. 13

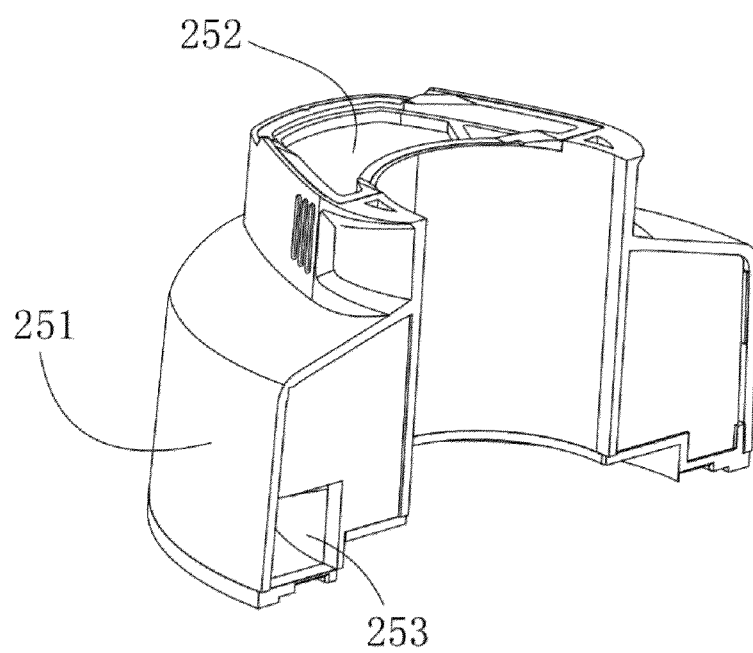


FIG. 14

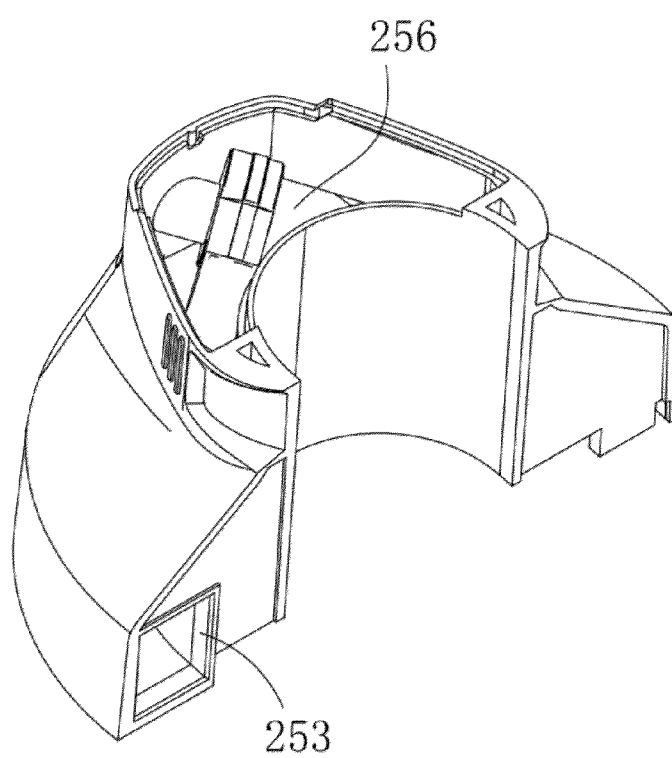


FIG. 15

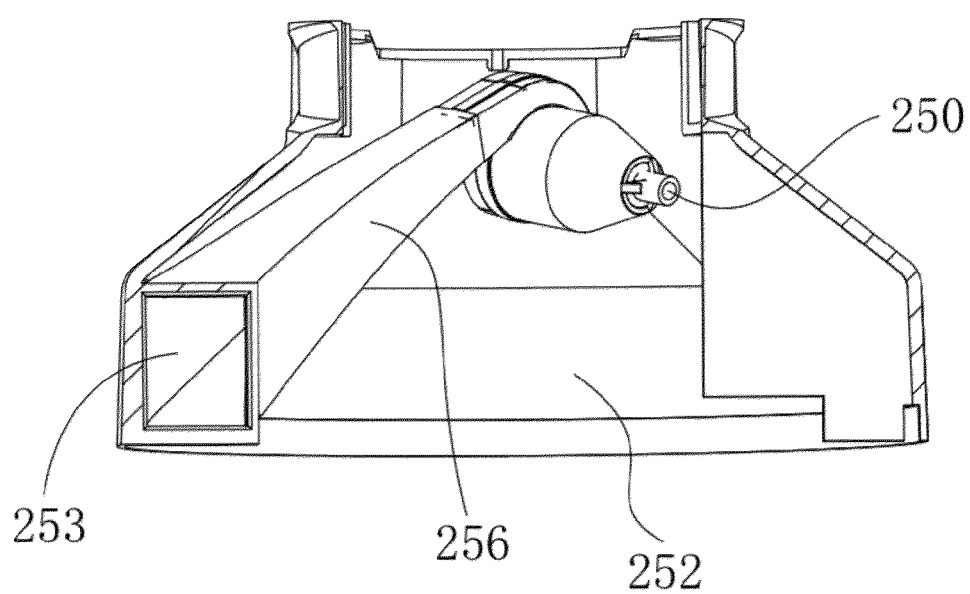


FIG. 16

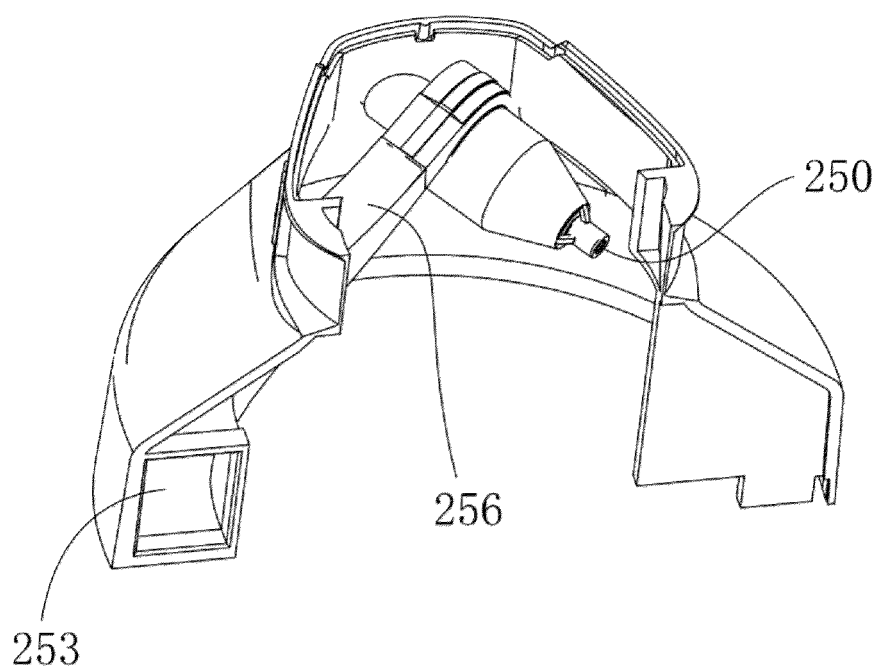


FIG. 17

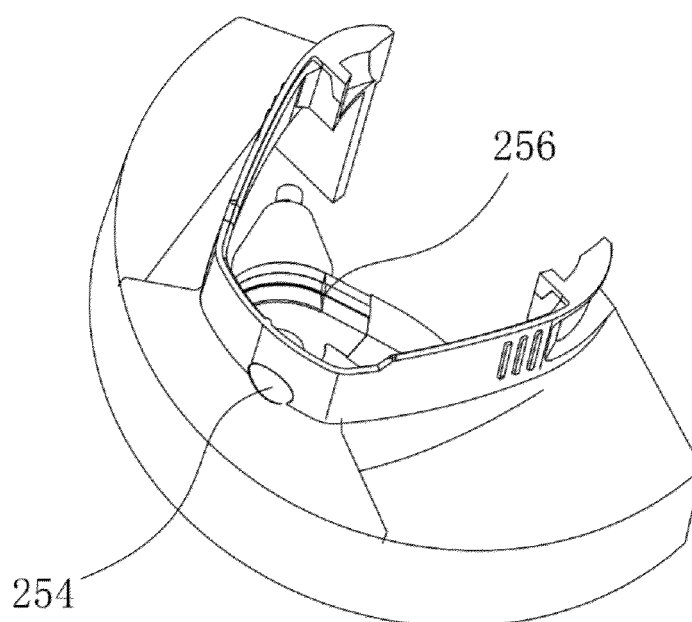


FIG. 18

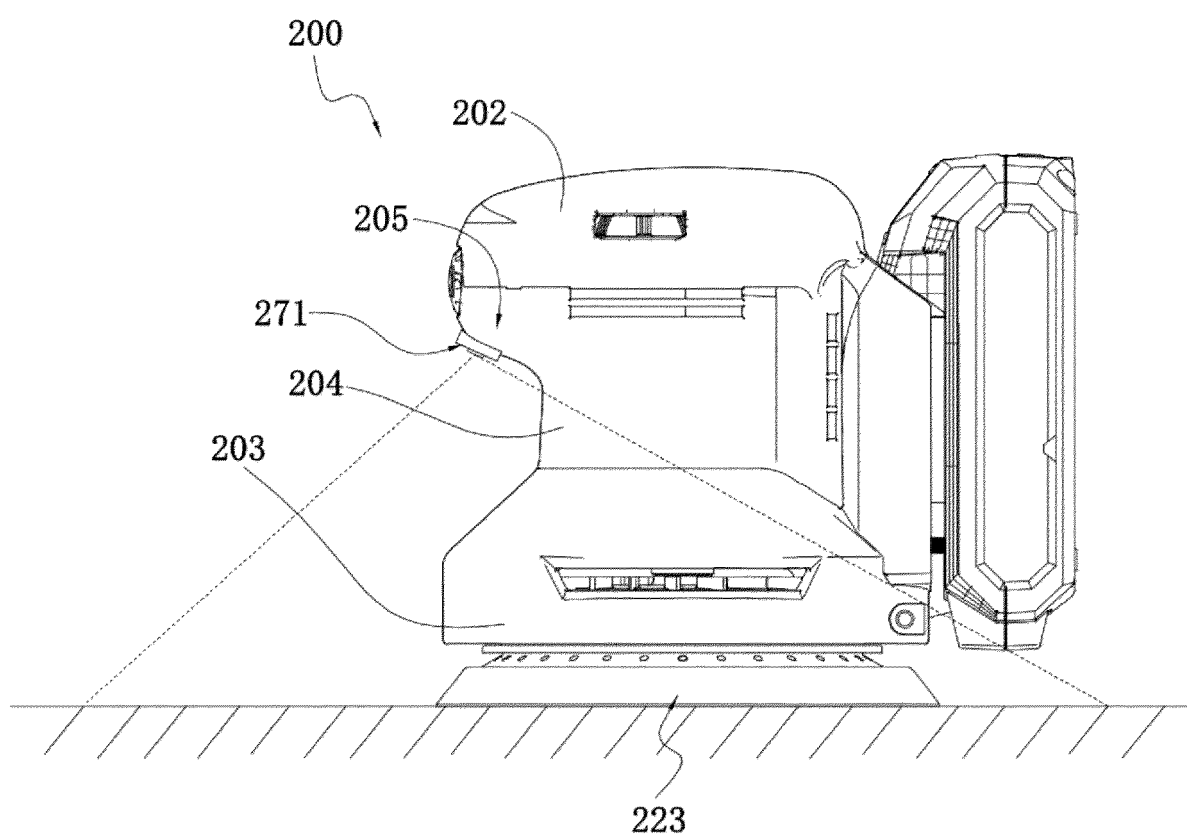


FIG. 19

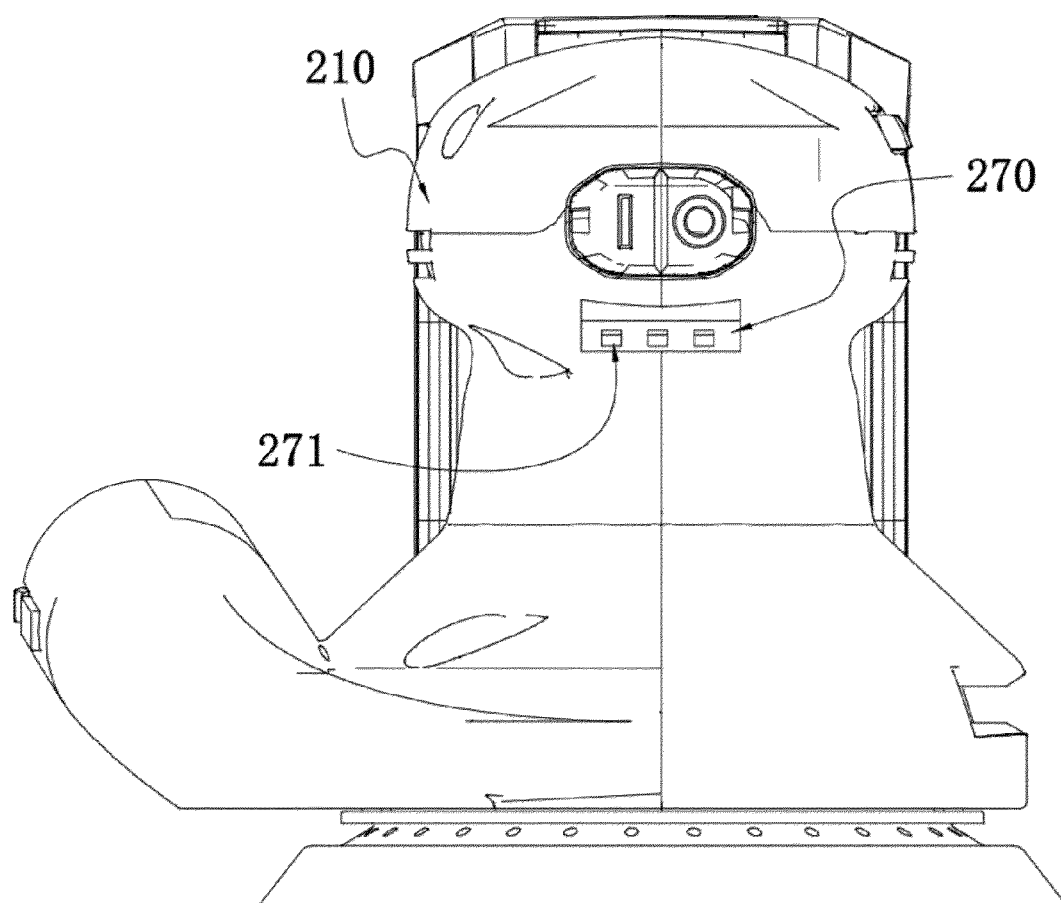


FIG. 20

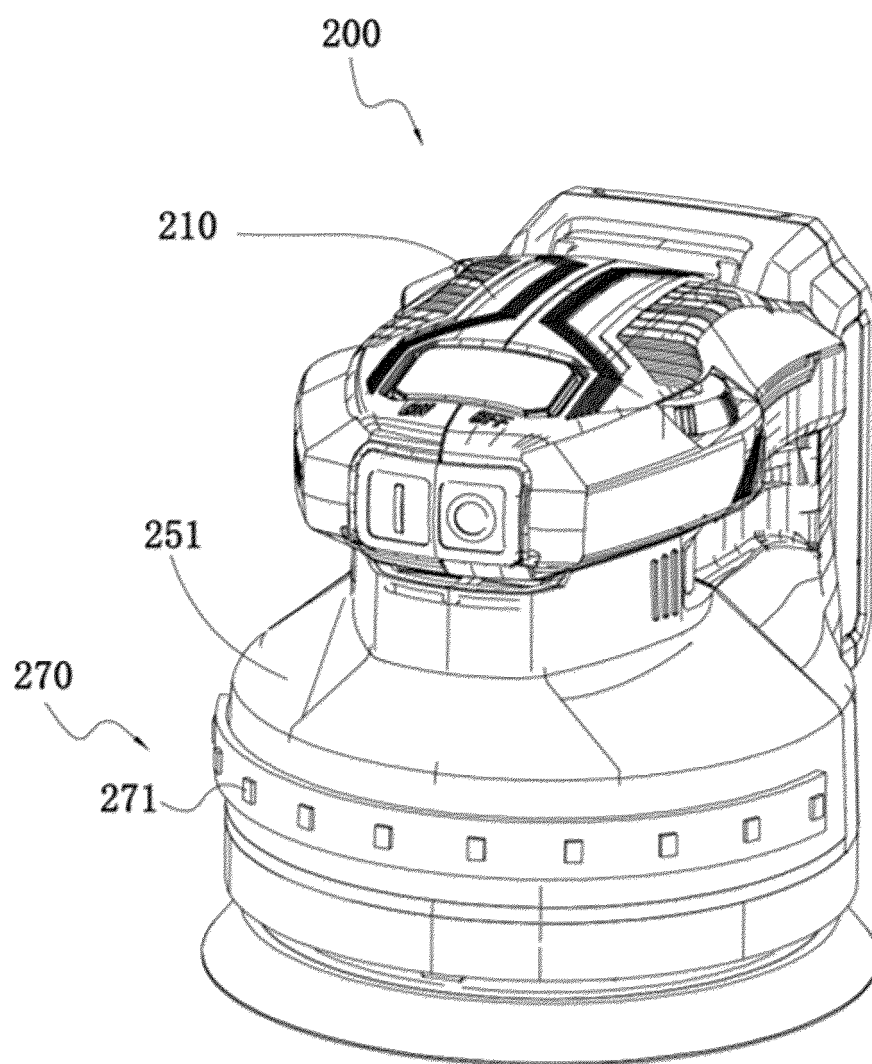


FIG. 21



EUROPEAN SEARCH REPORT

Application Number

EP 24 19 7785

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A	* figures 1-3 *	7	ADD. F21V33/00
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			B24B F21V B25H B25F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		29 January 2025	Bermejo, Marco
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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