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(54) PRESSURE GENERATOR AND MASSAGER

DRUCKERZEUGER UND MASSAGEGERÄT

GÉNÉRATEUR DE PRESSION ET DISPOSITIF DE MASSAGE

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of massaging devices, and in particular to a pressure generator and a massager.

BACKGROUND

[0002] D1 (KR20020059570A) describes a skin massage device which includes an air generator for generating air and supplying and a skin contact device for contacting supplied air on the skin, the air generator in which a piston is installed at the inside of a cylinder, an operation rod thereof is projected to the outside of the cylinder to connect a pressure part to the crank protrusions of a transmission shaft and a hose is connected to the discharge hole of the cylinder to connect generated air to the skin contact device; and the skin contact device is of a cup shape and detachably attached to the skin.

[0003] D2 (KR200167073Y1) provides a cupping device for a cupping therapy, which includes a cup and an inhaler 200. When the cup is placed on the skin, the inhaler is operated to directed the air in the cup out, so that the cup can suck on the skin tightly. The cup can slide on the skin smoothly by the lotion, and the protrusion can massage the skin simultaneously. As the massaging and the pressure stimulation are performed simultaneously, pores are open through which the body wastes and toxins leak, so that the marks and bruises on the skin are relieved.

[0004] D3 (DE9309142U1) provides a scalp treatment device, which includes a hand-held housing with a treatment head having an air-filled hollow space with a volume which is periodically varied by reciprocation of part of its enclosing wall, under control of battery operated electric drive motor. The application side of the hollow space is fitted with a treatment tool with a number of projecting prongs, at least some of which communicate with the air-filled hollow space and have an opening facing the scalp.

[0005] D4 (DE202017104021U1) provides a massage device for massage by means of pressure waves, which includes a housing with a handle section and a massage section, at least one chamber having an opening leading to the outside in the massage section. The chamber has an end wall portion, a first peripheral wall portion and a second peripheral wall portion, the first peripheral wall portion being disposed between the end wall portion and the second peripheral wall portion. and the second peripheral wall portion defines the opening, the end wall portion being at least partially movable, and the massage device includes drive means for imparting a predetermined vibration to the end wall portion, and wherein the first peripheral wall portion is substantially rigid and the second peripheral wall portion is substantially flexible.

[0006] With the accelerated pace of life, working pressures on people are increased. After daily working, a person may be tired, various portions of a body may ache. In order to relieve fatigue and soreness, people may take a variety of massagers to massage the body, such as a negative pressure massager. The negative pressure massager may adsorb and relax the skin to relieve the fatigue and soreness, so as to sooth the body and mind. However, the negative pressure massager in the related art may have a complicated structure, and may have a poor adsorption effect.

[0007] Therefore, the massager in the related art needs to be improved to avoid the above defects.

SUMMARY

[0008] The invention is defined by the appended claims.

[0009] The present disclosure provides a pressure generator and a massager which can improve suctioning effect thereof.

[0010] One aspect of the present disclosure provides a massager, which includes a flexible sleeve defining an adsorption port, a support shell defining an opening, a pressure generator mounted in the support shell, the pressure generator includes a housing with an opening communicated to the opening of the support shell and a receiving space, and a movable member movably inserted into the receiving space. The pressure generator further includes a driving device including a motor, and a transmission assembly having an eccentric transmission structure including an eccentric member and a connecting rod. The eccentric member connected with the motor, and the connecting rod connected between the eccentric member and the movable member. The flexible sleeve is configured to sleeve around the housing, the adsorption port is arranged in front of the housing and directly communicated with the opening of the housing, and the motor is configured to drive the movable member to reciprocate inside the receiving space without deformation, so as to periodically generate a negative pressure and a positive pressure at the adsorption port.

[0011] In at least one embodiment, the movable member includes a free end arranged in the receiving space, and a sealing ring arranged between the housing and the free end, the sealing ring surrounds the free end and resisting against between the free end and the housing.

[0012] In at least one embodiment, the free end defines a sealing slot configured to receive the sealing ring.

[0013] In at least one embodiment, the sealing ring includes an arc-shaped part and two fixing parts extending from two opposite sides of the arc-shaped part respectively, the two fixing parts are arranged at interval along a moving direction of the free end and extended toward the sealing ring, the arc-shaped part, the two fixing parts and the free end cooperate to define a space, and the arc-shaped part is configured to be deformed into the space.

[0014] In at least one embodiment, the pressure generator further includes a massaging member, the massa-

ging member includes a connecting part connected to a side of the free end facing the opening of the housing, and at least one massaging part arranged on the connecting part away from the free end and configured to partially extend out of the housing through the opening of the housing.

[0015] In at least one embodiment, the movable member is configured to separate the housing into a first chamber communicating with the opening of the housing and a second chamber, and the movable member further includes a unidirectional exhaust structure configured to communicate the first chamber with the second chamber unidirectionally.

[0016] In at least one embodiment, the unidirectional exhaust structure includes at least one exhaust hole running through the free end to communicate the first chamber with the second chamber, and a vent plug arranged on the free end and configured to cover the at least one exhaust hole away from the first chamber.

[0017] In at least one embodiment, the vent plug includes a main part arranged on a side of the free end away from the opening of the housing, and at least one covering part made of elastic material, the at least one covering part is capable of being deformed to cover or open the at least one exhaust hole; or the vent plug includes a main part arranged on a side of the free end away from the opening of the housing and defining at least one through hole communicating with the at least one exhaust hole, and at least one surrounding wall extending away from the main part and surrounding the at least one through hole respectively, the at least one surrounding wall is made of elastic material and capable of being deformed to close or open the at least one through hole.

[0018] In at least one embodiment, the housing includes a rigid part with an opening, and an absorbing member with the opening of the housing arranged on an end of the absorbing member away from the opening of the rigid part, the movable member is arranged inside the rigid part, the absorbing member is connected to the rigid part at the opening of the rigid part and defines an air passage communicating with the opening of the rigid part.

[0019] In at least one embodiment, a gap is defined between the movable member and an inner wall of the housing, the gap is not greater than 0.1mm.

[0020] In at least one embodiment, the pressure generator includes a protective sleeve made of a cushioning material and configured to sleeve an outside of the housing, the protective sleeve defines an opening communicated to the opening of the housing.

[0021] In at least one embodiment, the protective sleeve and the housing are spaced apart from each other to define a sound insulation space.

[0022] In at least one embodiment, the movable member includes a driving end connected to the driving device, and a free end connected to the driving end, and the free end defines a cavity communicated to the receiving space.

[0023] In at least one embodiment, at least one massaging protrusion is arranged on a side of the movable member facing the opening of the housing, the at least one massaging protrusion at least partially extends out of the opening of the housing; and/or the pressure generator includes a heating coil or a semiconductor refrigeration sheet arranged on the housing to adjust temperature at the opening of the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024]

FIG. 1 is a structural schematic view of a massager according to an embodiment of the present disclosure.

FIG. 2 is a cross-sectional view of the massager as shown in FIG. 1.

FIG. 3 is an exploded view of a pressure generator as shown in FIG. 1 according to a first embodiment of the present disclosure.

FIG. 4 is a structural schematic view of the pressure generator as shown in FIG. 3 in an assembled state.

FIG. 5 is a cross-sectional view of the pressure generator as shown in FIG. 4.

FIG. 6 is an enlarged view of a portion A as shown in FIG. 5.

FIG. 7 is a structural schematic view of a part of a pressure generator as shown in FIG. 1 according to a second embodiment of the present disclosure.

FIG. 8 is a structural schematic view of a massaging member and a sealing ring as shown in FIG. 7.

FIG. 9 is a structural schematic view of a pressure generator as shown in FIG. 1 according to a third embodiment of the present disclosure.

FIG. 10 is a structural schematic view of a vent plug as shown in FIG. 9.

FIG. 11 is a structural schematic view of the pressure generator as shown in FIG. 9 in an assembled state.

FIG. 12 is a cross-sectional view of the pressure generator as shown in FIG. 11.

FIG. 13 is a structural schematic view of a pressure generator according to a fourth embodiment of the present disclosure as shown in FIG. 1.

FIG. 14 is a structural schematic view of a vent plug as shown in FIG. 13.

FIG. 15 is a bottom plan view of the vent plug as shown in FIG. 14.

FIG. 16 is a structural schematic view of the massaging member and the sealing ring of the pressure generator having a unidirectional exhaust structure according to an embodiment of the present disclosure.

FIG. 17 is a structural schematic view of a massager according to another embodiment of the present disclosure.

FIG. 18 is a structural schematic view of a pressure

generator as shown in FIG. 17 according to a fifth embodiment of the present disclosure.

FIG. 19 is an exploded view of the pressure generator as shown in FIG. 18.

FIG. 20 is a cross-sectional view of the pressure generator as shown in FIG. 18.

FIG. 21 is an enlarged view of a portion B as shown in FIG. 18 according to an embodiment of the present disclosure.

FIG. 22 is an enlarged view of a portion B as shown in FIG. 18 according to another embodiment of the present disclosure.

FIG. 23 is a cross-sectional view of a pressure generator as shown in FIG. 17 according to a sixth embodiment of the present disclosure.

FIG. 24 is a cross-sectional view of a pressure generator as shown in FIG. 17 according to a seventh embodiment of the present disclosure.

FIG. 25 is a cross-sectional view of the pressure generator as shown in FIG. 24.

FIG. 26 is a structural schematic view of a pressure generator as shown in FIG. 17 according to an eighth embodiment of the present disclosure.

DETAILED DESCRIPTION

[0025] Technical solutions in the embodiments of the present disclosure will be clearly and completely described below by referring to the accompanying drawings in the embodiments of the present disclosure. Obviously, the described embodiments are only a part of, but not all of, the embodiments of the present disclosure. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments in the present disclosure and without making creative work shall fall within the scope of the present disclosure.

[0026] As shown in FIGS. 1 and 2, the present disclosure provides a massager 100. The massager 100 is configured to massage a body of a user, especially to massage sensitive portions of the body. The massager 100 may generate a negative pressure to massage and stimulate the sensitive portions.

[0027] The massager 1 may include a support shell 20, a pressure generator 30 arranged inside the support shell 20, and a battery (not labelled) arranged inside the support shell 20. The battery is configured to provide power to the pressure generator 30. A flexible sleeve 10 may be arranged to sleeve on an outside of the support shell 20, and the flexible sleeve 10 is configured to contact the human body. The flexible sleeve 10 defines an adsorption port 11, and a periphery of a wall of the adsorption port 11 is configured to contact a skin of the human body. The support shell 20 defines a fourth opening 21 communicated to the adsorption port 11. Periodic alternating positive and negative pressures generated by the pressure generator 30 may be conducted to the skin through the third opening 21 to stimulate the skin and achieve a massaging effect.

[0028] The flexible sleeve 10 may be made of a skin-friendly material, such as silicon, to improve the user experience.

[0029] The pressure generator 30 may be implemented by taking specific structures shown in the following embodiments.

Embodiment I

[0030] Referring to FIGS. 3 to 6, a pressure generator 30a includes a housing 31 with a first opening 3131 and a receiving space 3132, a movable member 33 (such as a piston) arranged inside the housing 31, and a driving device 35 configured to drive the movable member 33 to reciprocated move inside the housing 31 so as to generate a negative pressure at the first opening 3131. The movable member 33 is configured to separate the receiving space 3132 of the housing 31 into a first chamber 3133 and a second chamber 3134. The first chamber 3133 is communicated with the first opening 3131. When in use, the first opening 3131 is attached to human body, and the driving device 35 is configured to drive the movable member 33 to move away from the first opening 3131 so that a volume of the first chamber 3133 is increased and the negative pressure is generated at the first opening 3131. Therefore, the first opening 3131 can be sucked onto the human body under the negative pressure.

[0031] The housing 31 includes a rigid part 311 with a second opening 3111, and an absorbing member 313 which is flexible. The movable member 33 is arranged inside the rigid part 311. The absorbing member 313 is connected to the rigid part 311 at the second opening 3111. The absorbing member 313 defines an air passage 3135 communicating with the second opening 3111 and the first opening 3131. The first opening 3131 is formed at an end of the air passage 3135 away from the second opening 3111.

[0032] In at least one embodiment, the rigid part 311 and the absorbing member 313 are integrally formed. It should be understood that, in at least one another embodiment, the rigid part 311 and the absorbing member 313 are formed independently, and the absorbing member 313 can be connected to the rigid part 311 by any suitable structures, such as adhesive glues.

[0033] Referring to FIG. 5, the rigid part 311 includes a first chamber wall 3113 extending along a moving direction of the movable member 33 and surrounding the second opening 3111, and a second chamber wall 3115 connected to an end of the first chamber wall 3113 away from the second opening 3111. A driving end 333 of the moveable member 33 is configured to movably extend through the second chamber wall 3115 and connect the movable member 33 with the driving device 35. The driving device 35 is configured to drive the driving end 333 to move so as to bring the movable member 33 to reciprocated move inside the housing 31.

[0034] Referring to FIG. 5, a self-lubricating sleeve 335

is arranged between the driving end 333 and the second chamber wall 3115, so that the driving end 333 may movably extend through the second chamber wall 3115, which facilitates reducing a fiction between the driving end 333 and the second chamber wall 3115 when the driving end 333 moves relative to the second chamber wall 3115.

[0035] In at least one embodiment, the second chamber wall 3115 defines at least one vent hole 3117. Referring to FIG. 3, the number of the at least one vent hole 3117 is multiple. In at least one embodiment, the at least one vent hole 3117 is configured to run through the second chamber wall 3115. Through such arrangement, air can be vented outside of the housing 31 through the at least one vent hole 3117 when the movable member 33 moves away from the first opening 3131. Therefore, a resistance of the movable member 33 moving away from the first opening 3131 is reduced. Preferably, the at least one vent hole 3117 is configured to run through the second chamber wall 3115 along the moving direction of the movable member 33.

[0036] The movable member 33 further includes a free end 331 connected to the driving end 333, and a sealing ring 332 surrounding the free end 331. The sealing ring 332 is configured to resist against between the free end 331 and the chamber wall of the housing 31 to ensure a sealing performance. In detail, the sealing ring 332 is configured to resist against between the free end 331 and the first chamber wall 3113 of the housing 31. Therefore, air is prevented from running between the first chamber 3133 the second chamber 3134.

[0037] The driving end 333 is fixedly connected to the free end 331, so that a movement of the driving end 333 can bring the movable member 33 to reciprocated move inside the housing 31.

[0038] In at least one embodiment, the free end 331 defines a sealing slot 3311 on an outer wall thereof, and the sealing ring 332 is at least partially arranged inside the sealing slot 3311.

[0039] In at least one embodiment, the sealing ring 332 includes an arc-shaped part 3321 and two fixing parts 3323 arranged on two opposite sides of the arc-shaped part 3321 respectively. The arc-shaped part 3321 is spaced from the free end 331. The two fixing parts 3323 are arranged at interval along the moving direction of the movable member 33 and extended toward the sealing slot 3311 and received in the sealing slot 3311. The arc-shaped part 3321 together with the two fixing parts 3323 and the free end 331 defines a space 3325. The arc-shaped part 3321 can be deformed into the space 3325 so as to avoid jam during reciprocated moving of the movable member 33. It should be understood that, in at least one embodiment, the sealing ring 332 can be an O-shaped sealing ring, such as a traditional rubber sealing ring.

[0040] Referring to FIG. 6, in at least one embodiment, a center of curvature of the arc-shaped part 3321 is located at a position facing the space 3325, which facilitate the deformation of the arc-shaped part 3321 to move into the space 3325.

[0041] The driving device 35 includes a transmission assembly 351 and a motor 353. The motor 353 is configured to connect to the driving end 333 through the transmission assembly 351. The transmission assembly 351 can be any one of an eccentric transmission structure, a cam and a ball screw.

[0042] In at least one embodiment, the transmission assembly 351 has an eccentric transmission structure and includes an eccentric member 3511 and a connecting rod 3513. The eccentric member 3511 is connected to the motor 353, and the connecting rod 3513 is hinged with the driving end 33. When the pressure generator 30a is in use, the motor 353 is configured to drive the movable member 33 to reciprocated move inside the housing 31 through the eccentric member 3511, the connecting rod 3513, and the driving end 33.

Embodiment II

[0043] Referring to FIGS. 7 and 8, a second embodiment of the present disclosure provides a pressure generator 30b. The difference between the pressure generator 30b of the second embodiment and the pressure generator 30a of the first embodiment is that the pressure generator 30b of the second embodiment further includes a massaging member 37. The massaging member 37 includes a connecting part 371 connected to a side of the free end 331 facing the first opening 3131 and at least one massaging protrusion 373 extending away from the connecting part 371. The at least one massaging protrusion 373 is configured to partially extend out of the housing 31 through the first opening 3131. In at least one embodiment, when the movable member 33 moves toward the first opening 3131 and moves to a position closest to the first opening 3131, the at least one massaging protrusion 373 at least partially extends out of the housing 31 so as to massage human body, thus improving user experience.

[0044] In at least one embodiment, the massaging member 37 and the sealing ring 332 are integrally formed. A periphery of the connecting part 371 is connected with the sealing ring 332. It should be understood that, in at least one embodiment, the massaging member 37 and the sealing ring 332 can be two independent components and the massaging member 37 can be connected to the free end 331 of the movable member 33 with any suitable structures, such as adhesive glues.

Embodiment III

[0045] Referring to FIGS. 9 to 12, a third embodiment of the present disclosure provides a pressure generator 30c. The difference between the pressure generator 30c of the third embodiment and the pressure generator 30a of the first embodiment is that the movable member 33' of pressure generator 30c further includes a unidirectional

exhaust structure 39 communicating with the first chamber 3133 and the second chamber 3134. When the movable member 33' moves towards the first opening 3131, the unidirectional exhaust structure 39 is configured to communicate the first chamber 3133 with the second chamber 3134 under the air pressure in the first chamber 3133; when the movable member 33' moves away from the first opening 3131, the unidirectional exhaust structure 39 is configured to block the communication between the first chamber 3133 and the second chamber 3134 under the air pressure in the second chamber 3134. By setting the unidirectional exhaust structure 39, when the movable member 33' moves away from the first opening 3131, negative pressure is generated at the first opening 3131; when the movable member 33' moves towards the first opening 3131, air in the first chamber 3133 can be exhausted to the second chamber 3134 through the unidirectional exhaust structure 39, and the second chamber 3134 is communicated with the outside. Thus, the resistance during the movement of the movable member 33' can be reduced.

[0046] The unidirectional exhaust structure 39 includes at least one exhaust hole 391 running through the free end 331 of the movable member 33' to communicate the first chamber 3133 with the second chamber 3134, and a vent plug 393 arranged on a side of the free end 331 away from the first chamber 3133 and configured to cover the at least one exhaust hole 391. When the movable member 33' moves towards the first opening 3131, the vent plug 393 is configured to move to open the exhaust hole 391 so that the first chamber 3133 communicates with the second chamber 3134 through the exhaust hole 391 under the air pressure in the first chamber 3133. When the movable member 33' moves away from the first opening 3131, the vent plug 393 is configured to block the communication between the first chamber 3133 and the second chamber 3134 under the air pressure in the second chamber 3134.

[0047] Referring to FIGS. 10 and 12, the vent plug 393 is an annular sheet. In at least one embodiment, the vent plug 393 can be deformed. For example, the vent plug 393 can be made of silicon material to make the vent plug 393 flexible and soft. In detail, referring to FIG. 10, the vent plug 393 includes a main part 3931 arranged on the side of the free end 331 of the movable member 33' away from the first opening 3131 and at least one covering part 3933 configured to cover the at least one exhaust hole 391. The main part 3931 defines at least one through hole 3932. The covering part 3933 is extended from the main part 3931 into the at least one through hole 3932 respectively. In at least one embodiment, the covering part 3933 can move relative to the main part 3931.

[0048] When the movable member 33' moves away from the first opening 3131, the volume of the first chamber 3133 is increased to decrease the air pressure in the first chamber 3133 (a difference between the air pressure in the first chamber 3133 and the air pressure in the second chamber 3134 is not sufficient to prevent a deformation of the covering part 3933), therefore, the negative pressure is generated at the first opening 3131 to generate a suction force applied on human body. At the same time, the covering part 3933 covers the at least one exhaust hole 391 to block the communication between the first chamber 3133 and the second chamber 3134 under the negative pressure. With the volume of the first chamber 3133 getting bigger, the negative pressure getting bigger, which forces the covering part 3933 to remain covering the at least one exhaust hole 391 to keep blocking the communication between the first chamber 3133 and the second chamber 3134. Therefore, the first opening 3131 remains at a suction state.

[0049] When the movable member 33' moves towards the first opening 3131, the volume of the first chamber 3133 is decreased to decrease the negative pressure. The movable member 33' compresses air in the first chamber 3133 to increase the air pressure in the first chamber 3133. When a difference between the air pressure in the first chamber 3133 and the air pressure in the second chamber 3134 is greater enough to deform the covering part 3933 to open the at least one exhaust hole 391, air is vented from the first chamber 3133 to the second chamber 3134 to reduce the movement resistance of the movable member 33'.

[0050] In at least one embodiment, the main part 3931 can be connected to the free end 331 of the movable member 33' by adhesive glues.

[0051] In at least one embodiment, referring to FIGS. 9 and 10, the number of the at least one exhaust hole 391 is multiple. Correspondingly, the number of the at least one through hole 3932 and the number of the at least one covering part 3933 are multiple.

[0052] In at least one embodiment, referring to FIGS. 12 and 13, a heating coil 38 or a semiconductor refrigeration sheet 38 is arranged on the rigid part 311. In detail, the heating coil 38 or the semiconductor refrigeration sheet 38 are arranged on an outer side of the first chamber wall 3113. In at least one embodiment, the semiconductor refrigeration sheet 38 includes a hot end and a cold end opposite to the hot end. The hot end or the cold end can be attached to the first chamber wall 3113 so as to adjust a temperature of the absorbing member 313, thereby improving user's experiences. It should be understood that, in at least one embodiment, the semiconductor refrigeration sheet 38 can be replaced with the heating coil 38.

[0053] The sealing ring 332' can be a general O-shaped sealing ring, such as a rubber sealing ring. It should be understood that, in at least one embodiment, the sealing ring 332' can be the sealing ring 332 described in the first embodiment. That is, the sealing ring 332' can include the arc-shaped part 3321 and two fixing parts 3323 arranged two opposite sides of the arc-shaped part 3321 respectively. The two fixing parts 3323 are arranged at interval along the moving direction of the movable member and extended toward sealing slot 3311 and received in the sealing slot 3311 and received in

the sealing slot 3311. The arc-shaped part 3321 together with the two fixing parts 3323 and the free end 331 defines a space 3325. The arc-shaped part 3321 can be deformed into the space 3325.

Embodiment IV

[0054] Referring to FIGS. 13 to 15, a fourth embodiment of the present disclosure provides a pressure generator 30d. The difference between the pressure generator 30d of the fourth embodiment and the pressure generator 30c of the third embodiment is that a structure of the vent plug 393' is different from that of the vent plug 393. The vent plug 393' includes a main part 3931' arranged on the side of the free end 331 of the movable member 33' away from the first opening 3131 and at least one surrounding wall 3935 extending away from the main part 3931'. The main part 3931' defines at least one through hole 3932' corresponding to the at least one exhaust hole 391. The through holes 3932' is configured to communicate with the at least one exhaust hole 391. The at least one surrounding wall 3935 is configured to surround the at least one through hole 3932' respectively, and extend toward the second chamber 3134. Each of the at least one surrounding wall 3935 defines an air channel 3937 communicating with a corresponding through hole 3932'. The surrounding wall 3935 is made of elastic material and configured to be deformed to open or close (or substantially close) the air channel 3937.

[0055] When the movable member 33" moves away from the first opening 3131, the volume of the first chamber 3133 is increased to decrease the air pressure in the first chamber 3133 (a difference between the air pressure in the first chamber 3133 and the air pressure in the second chamber 3134 is not sufficient to prevent a deformation of the surrounding wall 3935), therefore, negative pressure is generated at the first opening 3131 to generate a suction force applied on human body. At the same time, the surrounding wall 3935 closes to block the communication between the first chamber 3133 and the second chamber 3134 under the negative pressure. With the volume of the first chamber 3133 getting bigger, the negative pressure getting bigger, which forces the surrounding wall 3935 to remain blocking the communication between the first chamber 3133 and the second chamber 3134. Therefore, the first opening 3131 remains at the suction state.

[0056] When the movable member 33" moves toward the first opening 3131, the volume of the first chamber 3133 is decreased to decrease the negative pressure. The moveable member 33 compresses air in the first chamber 3133 to increase the air pressure in the first chamber 3133. When a difference between the air pressure in the first chamber 3133 and the air pressure in the second chamber 3134 (the air pressure in the first chamber 3133 is greater than the air pressure in the second chamber 3134) is greater enough to make the surrounding wall 3935 deform to open the air channel 3937, the at least one air channel 3937 is communicated the first chamber 3133 through the at least one through holes 3932 and the at least one exhaust hole 391 with the second chamber 3134, therefore, air can be vented from the first chamber 3133 to the second chamber 3134 to reduce the movement resistance of the movable member 33".

[0057] It should be understood that, the unidirectional exhaust structure of the present disclosure is not limited to the unidirectional exhaust structure 39 described in the third embodiment and the fourth embodiment. For example, the unidirectional exhaust structure 39 can be a one-way valve extending through the free end 331. The vent plug 393, 393' described in the third embodiment and the fourth embodiment can be a flat plate structure made of rigid material, and the vent plug can be connected to the free end 331 through a spring. When the air pressure in the first chamber 3133 is greater enough to make the spring deform to open the exhaust hole 391. When the movable member 33 moves away from the first opening 3131, the volume of the first chamber 3133 gets bigger to decrease the air pressure in the first chamber 3133, the vent plug 35 blocks the exhaust hole 391 to block the communication between the first chamber 3133 and the second chamber 3134. Along with the volume of the first chamber 3133 gets bigger, the negative pressure gets bigger, which forces the vent plug 35 to remain blocking the exhaust hole 391.

[0058] The negative pressure generator with the unidirectional exhaust structure is not limited to the negative pressure generator shown in the third and fourth embodiments. Referring to FIG. 16, the negative pressure generator with the unidirectional exhaust structure can further includes the massaging member 37 as shown in FIG. 8. The massaging member 37 includes the connecting part 371 connected to a side of the free end 331 of the movable member 33 facing the first opening 3131 and the massaging protrusions 373 extending away from the connecting part 371. The massaging protrusions 373 is configured to be capable of at least partially extending out of the housing 31 through the first opening 3131. In order to make the first chamber 3133 and the second chamber 3134 communicate with each other, the connecting part 371 defines at least one air hole 3711 communicating with the at least one exhaust hole 391. Additionally, referring to FIG. 16, the massaging member 37 can be integrally formed with the sealing ring 332 with an outer edge of the connecting part 371 connected with the sealing ring 332.

[0059] It should be understood that, the driving device is not limited to the driving device 35 shown in the first to fourth embodiments. For example, the driving device can be an electromagnetic driver. The electromagnetic driver includes a first magnetic component and a second magnetic component connected to the transmission member. One of the first magnetic component and the second magnetic component is a coil, and the other one of the first magnetic component and the second magnetic com-

ponent is a magnet. When the coil is energized, interaction force between the first magnetic component and the second magnetic component can drive the movable member to reciprocated move.

[0060] The magnet can be a permanent magnet or an electromagnet.

[0061] As shown in FIG. 17, the present disclosure provides a massager 100'. The massager 100' is configured to massage a body of a user, especially to massage sensitive portions of the body. The massager 100' may generate a negative pressure to massage and stimulate the sensitive portions.

[0062] The massager 100' may include a support shell 20, a pressure generator 30 arranged inside the support shell 20, and a battery 40 arranged inside the support shell 20. The battery 40 is configured to provide power to the pressure generator 30. A flexible sleeve 10 may be arranged to sleeve an outside of the support shell 20, and the flexible sleeve 10 is configured to contact the human body. The flexible sleeve 10 defines an adsorption port 11, and a periphery of a wall of the adsorption port 11 is configured to contact a skin of the user. The support shell 20 defines a third opening 200 communicated to the adsorption port 11. Periodic alternating positive and negative pressures generated by the pressure generator 30 may be conducted to the skin through the third opening 200 to stimulate the skin and achieve a massaging effect.

[0063] The flexible sleeve 10 may be made of a skin-friendly material, such as silicon, to improve the user experience.

[0064] The pressure generator 30 may be implemented by taking specific structures shown in the following embodiments.

Embodiment V

[0065] As shown in FIGS. 18 to 22, a fifth embodiment of the present disclosure provides a pressure generator 30e. The pressure generator 30e includes a housing 31 defining a receiving space 3132, a movable member 33 movably extending into the receiving space 3132, and a driving device 35. The driving device 35 is configured to drive the movable member 33 to move along the receiving space 3132 reciprocally and linearly. The housing 31 defines a first opening 3131 communicated to the receiving space 3132. A gap 300 is defined between the movable member 33 and an inner wall of the housing 31.

[0066] In detail, the movable member 33 includes a free end 331 and a driving end 333. A cavity 3310 is defined in the free end 331. The free end 331 includes a bottom wall 3315 connected to the driving end 333 and a side wall 3313 extending from the bottom wall 3315 toward the first opening 3131. The bottom wall 3315 and the side wall 3313 cooperatively define the cavity 3310. The cavity 3310 is communicated to the receiving space 3132. The cavity 3310 allows a volume of the receiving space 3132 to be increased so that the pressure generator 30e has a large pressure variation range and a large pressure variation space. At the same time, the cavity 3310 may increase a contact area between the movable member 33 and air in the receiving space 3132, such that the movable member 33 may be subjected to a uniform force while moving, and the movable member 33 may move stably. The driving end 333 includes a transmitting element (not labelled) extended along the moving direction of the moveably member 33.

[0067] The free end 331 further includes a sleeve ring 334 sleeving the side wall 3313. The sleeve ring 334 is made of a metal, preferably made of aluminum alloy and the like. In the present embodiment, the gap 300 is defined between the sleeve ring 334 and the inner wall of the housing 31. As desired, an outer diameter of the bottom wall 3315 is greater than an outer diameter of the side wall 3313, thereby forming a limiting stage (not labelled) to position the sleeve ring 334. In the present embodiment, the movable member 33 includes a piston.

[0068] In the present embodiment, the pressure generator 30e further includes a protective sleeve 32. The protective sleeve 32 is made of a cushioning material and sleeved an outside of the housing 31. The protective sleeve 32 defines a third opening 320 communicated to the first opening 3131. The protective sleeve 32 is made of a cushioning material, such as silicone and the like. As shown in FIG. 17, the protective sleeve 32 is disposed between the support shell 20 and the housing 31. By arranging the protective sleeve 32, transmission of vibration to the outside may be reduced, and on the other hand, transmission of noise, which is generated due to the movable member 33 moving while the movable member 33 contacts the housing 31, to the outside may be reduced, such that noise may be reduced.

[0069] Only when the gap 300 is not greater than 0.1mm, a dynamic pressure may be generated at the third opening 320 and the first opening 3131, i.e., the negative pressure may be generated at the third opening 320 and the first opening 3131. By defining the gap 300 to be smaller, a larger noise may be prevented while using the massager 100', achieving a noise reduction. In use, the driving device 35 may be arranged to allow the movable member 33 (such as a piston) to move along a length direction in the housing 31 reciprocally. When the adsorption port 11 of the massager 100' is attached to the skin, the third opening 320 is covered. The movable member 33 moving reciprocally may change a volume of the receiving space 3132 defined by the housing 31. In this way, an internal air pressure is dynamically changed, even when the receiving space defined by the housing 31 generates the alternating positive and negative pressures. Preferably, the gap 300 is not greater than 0.05 mm.

[0070] In the present embodiment, as shown in FIG. 20, a block 321 is arranged at each of two ends of the protective sleeve 32, and the block 321 is extended toward the receiving space 3132. Two blocks 321 define a receiving cavity of the housing 31. The outside of the housing 31 is sleeved by the protective sleeve 32 for

wrapping, which can further reduce noise. The block 321 may be a convex block, and a plurality of blocks 321 may be spaced apart from each other and disposed between the two ends of the protective sleeve 32. Alternatively, the block 321 may be a ring-shaped wall, and two blocks 321 may be disposed at the two ends of the protective sleeve 32 respectively.

[0071] As shown in FIG. 22, the protective sleeve 32 and the housing 31 may be spaced apart from each other to define a sound insulation space 310. The sound insulation space 310 prevents the noise, which is generated by the reciprocating movement of the movable member 33, from transmitting to the outside, thus further reducing the noise. As needed, the sound insulation space 310 may preferably be a vacuum, which has a better effect to reduce the noise.

[0072] The driving device 35 includes a transmission assembly 351 and a motor 353. The transmission assembly 351 includes an eccentric member 3511 arranged on a shaft of the motor 353 and a connecting rod 3513. The eccentric member 3511 is movably connected to the driving end 333 through the connecting rod 3513. A bearing 3515 may be disposed between the connecting rod 3513 and the driving end 333, and another bearing 3515 may be disposed between the connecting rod 3513 and the eccentric member 3511. The bearing 3515 is fixed to the eccentric member 3511 through a screw 3517 to allow the connecting rod 3513 and the eccentric part 32 to rotate stably. The another bearing 3515 is fixed to a fixed protrusion on the driving end 333 through another screw 3517 to allow the connecting rod 3513 and the driving end 333 to rotate stably.

Embodiment VI

[0073] Another embodiment of the present disclosure further provides a pressure generator 30f. Referring to FIG. 23, the pressure generator 30f differs from the pressure generator 30e in the above embodiment only in that: the sleeve ring 334 and the side wall 3313 of the movable member 33 are configured as a one-piece structure. The one-piece structure is plastic. Preferably, the sleeve ring 334 and the side wall 3313 are formed as one piece by injection molding. Other structures of the pressure generator 30f are the same as those in the fifth embodiment, and will not be repeated.

Embodiment VII

[0074] As shown in FIGS. 24 and 25, a pressure generator 30g in the Embodiment VII differs from the pressure generator 30e in the Embodiment V in the following aspects.

[0075] As shown in FIG. 25, the free end 331 may be in a shape of a flat plate.

[0076] In the present embodiment, the pressure generator 30g further includes an absorbing member 313 connected to the housing 31. An end of the absorbing member 313 defines an adsorbing port 3130. The adsorbing port 3130 is communicated to the first opening 3131. The periodic alternating positive and negative pressures may also be generated at the adsorbing port 3130.

[0077] In the present embodiment, the absorbing member 313 is integrally formed with the housing 31. It shall be understood that, in other embodiments, the absorbing member 313 and the housing 31 may be connected by glue or the like. When the absorbing member 313 is arranged in the massager 100', the absorbing member 313 may be integrally formed or separately formed with the flexible sleeve 10.

[0078] The housing 31 includes a first cavity wall 3113 and a second cavity wall 3115. The first cavity wall 3113 is extended in the moving direction of the movable member 33 and enclosed to define the first opening 3131. The second cavity wall 3115 is disposed at an end of the first cavity wall 3113 away from the first opening 3131. The gap 300 is defined between the movable member 33 and the first cavity wall 3113. The second cavity wall 3115 is movably extended through the driving end 333. The driving end 333 is connected to the movable member 33 and the driving device 35, such that the driving device 35 may drive the driving end 333 to further drive the movable member 33 to reciprocally move within the housing 31.

[0079] In the present embodiment, the second cavity wall 3115 defines a leaking hole 3116. The leaking hole 3116 is extended through the second cavity wall 3115 along the moving direction of the movable member 33.

[0080] The driving device 35 includes a transmission assembly 351 and a motor 353. The motor 353 is connected to the driving end 333 through the transmission assembly 351. The transmission assembly 351 may be any one of an eccentric transmission structure, a cam, and a rolling ball screw.

[0081] In the present embodiment, the transmission assembly 351 is the eccentric transmission structure. The transmission assembly 351 includes an eccentric member 3511 and a connecting rod 3513 that are transmittably connected to each other. The eccentric member 3511 is connected to the motor 353, and the connecting rod 3513 is connected to the driving end 333.

[0082] When the pressure generator is operating, the adsorbing port 3130 is placed at a part of the body that needs massage. The motor 353 is configured to drive the movable member 33 to reciprocally move in the housing 31 by driving the eccentric member 3511, the connecting rod 3513 and the driving end 333 successively. In this way, the periodic alternating positive and negative pressures may be generated at the adsorbing port 3130, achieving the effect of adsorption and relief.

Embodiment VIII

[0083] As shown in FIG. 26, a difference between a pressure generator 30h in the Embodiment VIII and the

pressure generator 30g of the Embodiment VII includes following aspects.

[0084] In the fourth embodiment, a plurality of massaging protrusions 373 may be arranged on a side of the movable member 33 facing the first opening 3131. While the movable member 33 is moving reciprocally towards the first opening 3131, the plurality of massaging protrusions 373 may at least partially protrude out of the adsorbing port 3130. In detail, when the movable member 33 moves towards the first opening 3131 to reach a position closest to the first opening 3131, the plurality of massaging protrusions 373 may at least partially protrude out of the adsorbing port 3130. In this way, the plurality of massaging protrusions 373 may massage the body.

[0085] To be noted that, a structure of the driving device 35 is not limited to the structure shown in the fourth and the fifth embodiment. For example, the driving device 35 may be an electromagnetic drive member. The electromagnetic drive member includes a first magnetic member and a second magnetic member connected to the driving end. One of the first magnetic member and the second magnetic member includes wires, and the other of the first magnetic member and the second magnetic member includes a magnet. When the wire is conducted, a force between the first magnetic member and the second magnetic member may drive the movable member to move reciprocally.

Claims

1. A massager (100), comprising:

a flexible sleeve (10), defining an adsorption port (11);
a support shell (20), defining an opening (21);
a pressure generator (30), mounted in the support shell (20), the pressure generator (30) comprises a housing (31) with an opening (3131) communicated to the opening (21) of the support shell and a receiving space (3132), and a movable member (33) movably inserted into the receiving space (3132), **characterized in that**, the pressure generator (30) further comprises:
a driving device (35), comprising a motor (353), a transmission assembly having an eccentric transmission structure including an eccentric member (3511) and a connecting rod (3512), the eccentric member (3511) connected with the motor (353), and the connecting rod (3513) connected between the eccentric member (3511) and the movable member (33);
the flexible sleeve (10) is configured to sleeve around the housing (31), the adsorption port (11) is arranged in front of the housing (31) and directly communicated with the opening (3131) of the housing, and the motor (353) is configured to drive the movable member (33) to reciprocate inside the receiving space (3132) without deformation, so as to periodically generate a negative pressure and a positive pressure at the adsorption port (11).

2. The massager (100) according to claim 1, wherein the movable member (33) comprises:

a free end (331) arranged in the receiving space (3132); and
a sealing ring (332) arranged between the housing (31) and the free end (331), the sealing ring (332) surrounding the free end (331) and resisting against between the free end (331) and the housing (31).

3. The massager (100) according to claim 2, wherein the free end (331) defines a sealing slot (3311) configured to receive the sealing ring (332).

4. The massager (100) according to claim 3, wherein the sealing ring (332) comprises:

an arc-shaped part (3321); and
two fixing parts (3323) extending from two opposite sides of the arc-shaped part (3321) respectively, the two fixing parts (3323) being arranged at interval along a moving direction of the free end (331) and extended toward the sealing ring (332), the arc-shaped part (3321), the two fixing parts (3323) and the free end (331) cooperating to define a space (3325), and the arc-shaped part (3321) being configured to be deformed into the space (3325).

5. The massager (100) according to claim 2, wherein the pressure generator further comprising a massaging member (37), the massaging member (37) comprising:

a connecting part (371) connected to a side of the free end (331) facing the opening (3131); and
at least one massaging part (373) arranged on the connecting part (371) away from the free end (331) and configured to partially extend out of the housing (31) through the opening (3131).

6. The massager (100) according to claim 2, wherein, the movable member (33) is configured to separate the housing (31) into a first chamber (3313) communicating with the opening (3131) of the housing and a second chamber (3134); and
the movable member (33) further comprises a unidirectional exhaust structure (39) configured to communicate the first chamber (3313) with the second chamber (3134) unidirectionally.

7. The massager (100) according to claim 6, wherein the unidirectional exhaust structure (39) comprises:

at least one exhaust hole (391) running through the free end (331) to communicate the first chamber (3313) with the second chamber (3134); and
a vent plug (393) arranged on the free end (331) and configured to cover the at least one exhaust hole (391) away from the first chamber (3313).

8. The massager (100) according to claim 7, wherein the vent plug (393) comprises:

a main part (3931) arranged on a side of the free end (331) away from the opening (3131); and
at least one covering part (3933) made of elastic material, the at least one covering part (3933) being capable of being deformed to cover or open the at least one exhaust hole (391); or
the vent plug (393) comprises:

a main part (3931) arranged on a side of the free end (331) away from the opening (3131) and defining at least one through hole (3932) communicating with the at least one exhaust hole (391); and
at least one surrounding wall (3935) extending away from the main part (3931) and surrounding the at least one through hole (3932) respectively, the at least one surrounding wall (3935) being made of elastic material and capable of being deformed to close or open the at least one through hole (3932).

9. The massager (100) according to claim 2, wherein the housing (31) comprises:

a rigid part (311) with an opening (3111), the movable member (33) being arranged inside the rigid part (311); and
an absorbing member (313) with the opening (3131) arranged on an end of the absorbing member (313) away from the opening (3111), the absorbing member (313) being connected to the rigid part (311) at the opening (3111) and defining an air passage (3135) communicating with the opening (3111).

10. The massager (100) according to claim 1, wherein a gap (300) is defined between the movable member (33) and an inner wall of the housing (31), the gap (300) being not greater than 0.1mm.

11. The massager (100) according to claim 10, wherein further comprising a protective sleeve (32) made of a cushioning material and configured to sleeve an outside of the housing (31), the protective sleeve (32) defining an opening (320) communicated to the opening (3131).

12. The massager (100) according to claim 11, wherein the protective sleeve (32) and the housing (31) are spaced apart from each other to define a sound insulation space (310).

13. The massager (100) according to claim 10, wherein the movable member (33) comprises:

a driving end (333) connected to the driving device (35); and
a free end (331) connected to the driving end (333), and the free end (331) defining a cavity (3310) communicated to the receiving space (3132).

14. The massager (100) according to claim 1, wherein at least one massaging protrusion (373) is arranged on a side of the movable member (33) facing the opening (3131) of the housing,

the at least one massaging protrusion (373) at least partially extending out of the opening (3131) of the housing;
and/or the pressure generator (30) comprises a heating coil (38) or a semiconductor refrigeration sheet (38) arranged on the housing (31) to adjust temperature at the opening (3131) of the housing.

Patentansprüche

1. Ein Massagegerät (100), das Folgendes umfasst:

Eine flexible Umhüllung (10), die eine Adsorptionsöffnung (11) definiert;
eine Tragschale (20), die eine Öffnung (21) definiert;
einen Druckgenerator (30), der in der Tragschale (20) montiert ist, wobei der Druckgenerator (30) ein Gehäuse (31) mit einer Öffnung (3131) umfasst, die mit der Öffnung (21) der Tragschale verbunden ist,
und mit einem Aufnahmeraum (3132) und einem bewegbaren Glied (33), das bewegbar im Aufnahmeraum (3132) aufgenommen ist, **dadurch gekennzeichnet, dass** der Druckgenerator (30) weiter Folgendes umfasst:

eine Antriebsvorrichtung (35), die einen Motor (353), eine Getriebegaugruppe mit einer exzentrischen Getriebestruktur, einschliesslich eines exzentrischen Gliedes (3511), sowie eine Verbindungsstange

(3512) umfasst, wobei das exzentrische Glied (3511) mit dem Motor (353) verbunden ist, und die Verbindungsstange (3513) zwischen dem exzentrischen Glied (3511) und dem bewegbaren Glied (33) angeschlossen ist;
eine flexible Umhüllung (10), die konfiguriert ist, um das Gehäuse (31) zu umhüllen, wobei die Adsorptionsöffnung (11) vor dem Gehäuse (31) angeordnet ist und direkt mit der Öffnung (3131) des Gehäuses verbunden ist,
und wobei der Motor (353) konfiguriert ist, um das bewegbare Glied (33) anzutreiben, damit es sich im Aufnahmeraum (3132) ohne Verformung hin- und herbewegt, um so regelmässig einen negativen und einen positiven Druck an der Adsorptionsöffnung (11) zu erzeugen.

2. Das Massagegerät gemäss Anspruch 1, bei dem das bewegbare Glied (33) Folgendes umfasst:

Ein freies Ende (331), das im Aufnahmeraum (3132) angeordnet ist; und
einen Dichtungsring (332), der zwischen dem Gehäuse (31) und dem freien Ende (331) angeordnet ist, wobei der Dichtungsring (332) das freie Ende (331) umschliesst und dagegen zwischen dem freien Ende (331) und dem Gehäuse widerstandsfähig ist.

3. Das Massagegerät (100) gemäss Anspruch 2, bei dem das freie Ende (331) einen Dichtungsspalt (3311) definiert, der für die Aufnahme des Dichtungsringes (332) konfiguriert ist.

4. Das Massagegerät (100) gemäss Anspruch 3, bei dem der Dichtungsring (332) Folgendes umfasst:

Einen bogenförmigen Teil (3321); und
zwei Befestigungsteile (3323), die sich jeweils ab gegenüberliegenden Seiten des bogenförmigen Teils (3321) erstrecken, wobei die beiden Befestigungsteile (3323) in Abständen längs einer Bewegungsrichtung des freien Endes (331) angeordnet sind und sich in Richtung des Dichtungsringes (332) erstrecken, wobei der bogenförmige Teil (3321), die beiden Befestigungsteile (3323) und das freie Ende (331) kooperieren, um einen Raum (3325) zu definieren, und der bogenförmige Teil (3321) konfiguriert ist, um für das Einfügen in den Raum (3325) verformt zu werden.

5. Das Massagegerät (100) gemäss Anspruch 2, bei dem der Druckgenerator weiter ein Massageglied (37) umfasst, wobei das Massageglied (37) Folgendes umfasst:

Einen Verbindungsteil (371), der an einer Seite des freien Endes (331) hingerichtet zu der Öffnung (3131) angeschlossen ist; und
mindestens einen Massageteil (373), der am Verbindungsteil (371) abgewandt vom freien Ende (331) angeordnet und konfiguriert ist, um sich teilweise aus dem Gehäuse (31) durch die Öffnung (3131) zu erstrecken.

6. Das Massagegerät (100) gemäss Anspruch 2, bei dem das bewegbare Glied (33) konfiguriert ist, um das Gehäuse (31) in eine separate Kammer (3313), die mit der Öffnung (3131) kommuniziert, und eine zweite Kammer (3134) zu trennen; und
wobei das bewegbare Glied (33) weiter eine unidirektionale Ausstromstruktur (39) aufweist, die konfiguriert ist, um die erste Kammer (3313) mit der zweiten Kammer (3134) unidirektional zu verbinden.

7. Das Massagegerät (100) gemäss Anspruch 6, bei dem die unidirektionale Ausstromstruktur (39) Folgendes umfasst:

Mindestens ein Ausstromloch (391), das durch das frei Ende (331) verläuft, um die erste Kammer (3313) mit der zweiten Kammer (3134) zu verbinden; und
einen Entlüftungsstopfen (393), der am freien Ende (331) angeordnet und konfiguriert ist, um das mindestens eine, von der ersten Kammer (3313) weggerichtete Ausstromloch (391) zu konfigurieren.

8. Das Massagegerät (100) gemäss Anspruch 7, bei dem der Entlüftungsstopfen (393) Folgendes umfasst:

Einen Hauptteil (3931), der an einer Seite des freien Endes (331) abgewandt von der Öffnung (3131) angeordnet ist; und
mindestens einen Abdeckungsteil (3933) aus elastischem Material, wobei der mindestens eine Abdeckungsteil (3933) sich deformieren lässt, um das mindestens eine Ausstromloch (391) zu decken oder zu öffnen; oder
der Entlüftungsstopfen (393) Folgendes umfasst:

einen Hauptteil (3931), der an einer Seite des freien Endes (331) abgewandt von der Öffnung (3131) angeordnet ist und mindestens ein Durchgangsloch (3932) definiert, das mit dem mindestens einen Ausstromloch (391) kommuniziert; und
mindestens eine umgebende Wand (3935), die sich jeweils weg vom Hauptteil (3931)

ausdehnt und das mindestens eine Durchgangsloch (3932) umrundet, wobei die mindestens eine umgebende Wand (3935) aus elastischem Material gefertigt ist und deformiert werden kann, um das mindestens eine Durchgangsloch (3932) zu schliesen oder öffnen.

9. Das Massagegerät (100) gemäss Anspruch 2, bei dem das Gehäuse (31) Folgendes umfasst:

Einen starren Teil (311) mit einer Öffnung (3111), wobei das bewegbare Glied (33) innerhalb des starren Teils (311) angeordnet ist; und
ein Absorptionsglied (313) mit der Öffnung (3131), die an einem von der Öffnung weggerichteten Ende des Absorptionsgliedes (313) angeordnet ist, wobei das Absorptionsglied (313) an den starren Teil (311) bei der Öffnung angeschlossen ist und einen Luftdurchgang (3135) definiert, der mit der Öffnung kommuniziert (3111).

10. Das Massagegerät (100) gemäss Anspruch 1, bei dem ein Spalt (300) zwischen dem bewegbaren Glied (33) und einer Innenwand des Gehäuses (31) definiert ist, wobei der Spalt (300) nicht grösser ist als 0,1 mm.

11. Das Massagegerät (100) gemäss Anspruch 10, das weiter eine Schutzumhüllung (32) aus federndem Material umfasst und die konfiguriert ist, um eine Aussenseite des Gehäuses (31) zu ummanteln, wobei die Schutzumhüllung (32) eine Öffnung (320) definiert, die mit der Öffnung (3131) kommuniziert.

12. Das Massagegerät (100) gemäss Anspruch 11, bei dem die Schutzumhüllung (32) und das Gehäusse voneinander beabstandet sind, um einen Schalldämmungsraum (310) zu definieren.

13. Das Massagegerät (100) gemäss Anspruch 10, bei dem das bewegbare Glied (33) Folgendes umfasst:

Ein Antriebsende (333), das an die Antriebsvorrichtung (35) angeschlossen ist; und
ein freies Ende (331), das an das Antriebsende (333) angeschlossen ist, und das einen Hohlraum (3310) definierende freie Ende, (331), das mit dem Aufnahmeraum (3132) kommuniziert.

14. Das Massagegerät (100) gemäss Anspruch 1, bei dem mindestens ein Massagevorsprung (373) an einer Seite des bewegbaren Glieds (33) hingerichtet zur Öffnung (3131) des Gehäuses angeordnet ist,

wobei der mindestens eine Massagevorsprung (373) sich mindestens teilweise aus der Öffnung (3131) des Gehäuses erstreckt;
und/oder der Druckgenerator (30) eine Heizschlange (38) oder ein Halbleiterkühlblech (38) umfasst, das am Gehäuse (31) angeordnet ist, um die Temperatur an der Öffnung (3131) des Gehäuses einzustellen.

Revendications

1. Un appareil de massage (100), comprenant

un manchon flexible (10), définissant un orifice d'adsorption (11) ;
une coquille de support (20), définissant une ouverture (21) ;
une coquille de support (20), définissant une ouverture (21) ;
un générateur de pression (30), monté dans la coquille de support (20), le générateur de pression (30) comprenant un boîtier (31) avec une ouverture (3131) en communication avec l'ouverture (21) de la coquille de support et un espace de réception (3132), ainsi qu'un élément mobile (33) inséré de manière mobile dans l'espace de réception (3132), **caractérisé en ce que** le générateur de pression (30) comprend en outre :

un dispositif d'entraînement (35), comprenant un moteur (353), un ensemble de transmission ayant une structure de transmission excentrique comprenant un élément excentrique (3511) et une bielle (3512), dans lequel l'élément excentrique (3511) est relié au moteur (353), et la bielle (3513) est reliée entre l'élément excentrique (3511) et l'élément mobile (33) ;
le manchon flexible (10) est configuré pour entourer le boîtier (31), l'orifice d'adsorption (11) est disposé devant le boîtier (31) et communique directement avec l'ouverture (3131) du boîtier, et le moteur (353) est configuré pour entraîner l'élément mobile (33) dans un mouvement de va-et-vient à l'intérieur de l'espace de réception (3132) sans déformation, de manière à générer périodiquement une pression négative et une pression positive au niveau de l'orifice d'adsorption (11).

2. L'appareil de massage (100) selon la revendication 1, dans lequel l'élément mobile (33) comprend :

une extrémité libre (331) disposée dans l'espace de réception (3132) ; et
une bague d'étanchéité (332) disposée entre le boîtier (31) et l'extrémité libre (331), la bague

d'étanchéité (332) entourant l'extrémité libre (331) et résistant à la pression induite entre l'extrémité libre (331) et le boîtier (31).

3. L'appareil de massage (100) selon la revendication 2, dans lequel l'extrémité libre (331) définit une rainure d'étanchéité (3311) configurée pour loger la bague d'étanchéité (332).

4. L'appareil de massage (100) selon la revendication 3, dans lequel la bague d'étanchéité (332) comprend :

une portion en forme d'arc (3321) ; et
deux pièces de fixation (3323) s'étendant respectivement depuis deux côtés opposés de la portion en forme d'arc (3321), les deux pièces de fixation (3323) étant disposées à intervalles le long d'une direction de déplacement de l'extrémité libre (331) et étendues vers la bague d'étanchéité (332), la portion en forme d'arc (3321), les deux pièces de fixation (3323) et l'extrémité libre (331) coopérant pour définir un espace (3325), et la portion en forme d'arc (3321) étant configurée pour être déformée dans l'espace (3325).

5. L'appareil de massage (100) selon la revendication 2, dans lequel le générateur de pression comprend en outre un élément de massage (37), l'élément de massage (37) comprenant :

une pièce de connexion (371) reliée à un côté de l'extrémité libre (331) faisant face à l'ouverture (3131) ; et
au moins un élément de massage (373) disposé sur la pièce de connexion (371) à l'écart de l'extrémité libre (331) et configuré pour s'étendre partiellement hors du boîtier (31) à travers l'ouverture (3131).

6. L'appareil de massage (100) selon la revendication 2, dans lequel l'élément mobile (33) est configuré pour séparer le boîtier (31) en une première chambre (3313) communiquant avec l'ouverture (3131) du boîtier et une deuxième chambre (3134) ; et
l'élément mobile (33) comprend en outre une structure de décharge unidirectionnelle (39) configurée pour faire communiquer la première chambre (3313) avec la seconde chambre (3134) de manière unidirectionnelle.

7. L'appareil de massage (100) selon la revendication 6, dans lequel la structure de décharge unidirectionnelle (39) comprend :

au moins un trou d'évacuation (391) traversant l'extrémité libre (331) pour faire communiquer la première chambre (3313) avec la seconde chambre (3134) ; et
un bouchon de purge (393) disposé sur l'extrémité libre (331) et configuré pour couvrir l'au moins un trou d'évacuation (391) à l'écart de la première chambre (3313).

8. L'appareil de massage (100) selon la revendication 7, dans lequel le bouchon de purge (393) comprend :

une portion principale (3931) disposée sur un côté de l'extrémité libre (331) éloignée de l'ouverture (3131) ; et
au moins une pièce de recouvrement (3933) fabriquée en matériau élastique, où au moins cette pièce de recouvrement (3933) peut être déformée pour couvrir ou ouvrir l'au moins un trou d'évacuation (391) ; ou
le bouchon de purge (393) comprend
une portion principale (3931) disposée sur un côté de l'extrémité libre (331) éloignée de l'ouverture (3131) et définissant au moins un trou traversant (3932) communiquant avec l'au moins un trou d'évacuation (391) ; et
au moins une paroi périphérique (3935) s'étendant à l'écart de la portion principale (3931) et entourant respectivement le au moins un trou de passage (3932), ladite au moins une paroi périphérique (3935) étant fabriquée dans un matériau élastique et pouvant être déformée pour fermer ou ouvrir ledit au moins un trou de passage (3932).

9. L'appareil de massage (100) selon la revendication 2, dans lequel le boîtier (31) comprend :

une portion rigide (311) ayant une ouverture (3111), l'élément mobile (33) étant disposé à l'intérieur du portion rigide (311) ; et
un élément absorbant (313) avec l'ouverture (3131) disposé sur une extrémité de l'élément absorbant (313) éloignée de l'ouverture (3111), l'élément absorbant (313) étant relié à la portion rigide (311) au niveau de l'ouverture (3111) et définissant un passage d'air (3135) communiquant avec l'ouverture (3111).

10. L'appareil de massage (100) selon la revendication 1, dans lequel un espace (300) est défini entre l'élément mobile (33) et une paroi intérieure du boîtier (31), la taille de l'espace (300) n'étant pas supérieure à 0,1 mm.

11. L'appareil de massage (100) selon la revendication 10, comprenant en outre un manchon de protection (32) constitué d'un matériau amortissant et configuré pour envelopper la partie extérieure du boîtier (31), le manchon de protection (32) définissant une ou-

verture (320) communiquée à l'ouverture (3131).

12. L'appareil de massage (100) selon la revendication 11, dans lequel le manchon de protection (32) et le boîtier (31) sont espacés l'un de l'autre pour définir un espace d'isolation acoustique (310).

13. L'appareil de massage (100) selon la revendication 10, dans lequel l'élément mobile (33) comprend :

une extrémité d'entraînement (333) reliée au dispositif d'entraînement (35) ; et
une extrémité libre (331) reliée à l'extrémité d'entraînement (333), où l'extrémité libre (331) définit une cavité (3310) communiquée à l'espace de réception (3132).

14. L'appareil de massage (100) selon la revendication 1, dans lequel au moins une protubérance de massage (373) est disposée sur un côté de l'élément mobile (33) faisant face à l'ouverture (3131) du boîtier,

l'au moins une protubérance de massage (373) s'étend au moins partiellement hors de l'ouverture (3131) du boîtier ;
et/ou le générateur de pression (30) comprend un serpentin chauffant (38) ou une grille de réfrigération semi-conductrice (38) disposée sur le boîtier (31) pour ajuster la température à l'ouverture (3131) du boîtier.

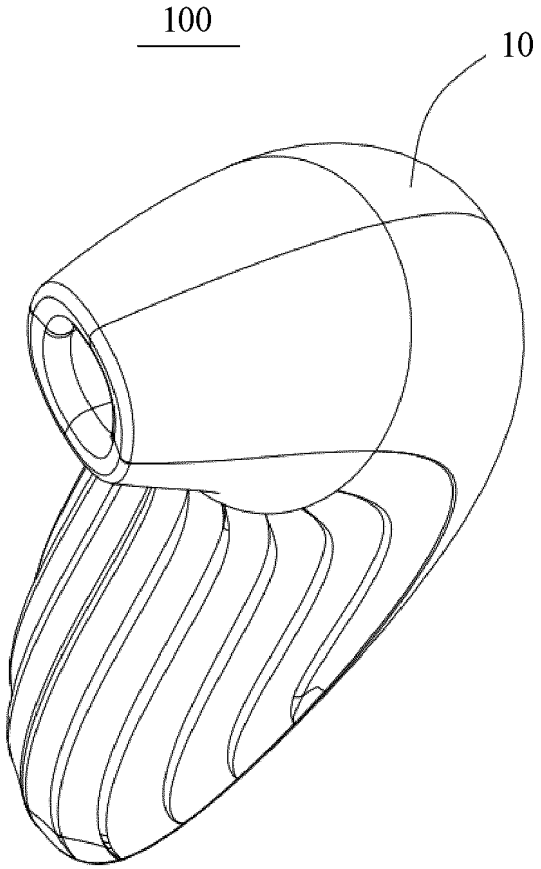


FIG. 1

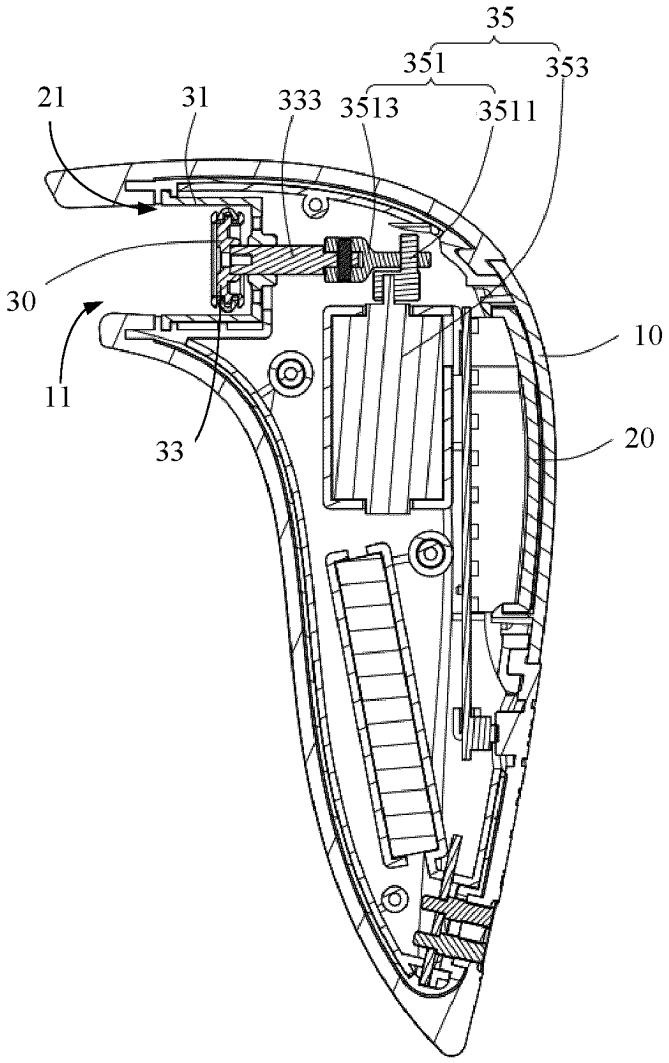


FIG. 2

30a

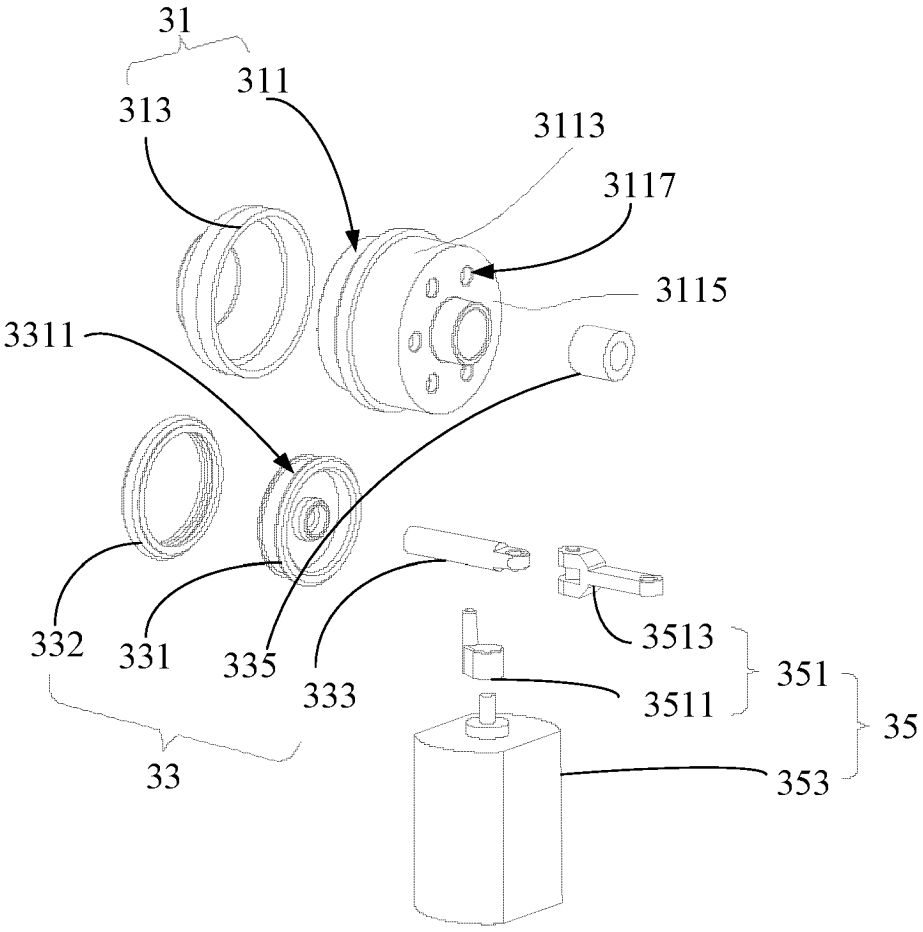

31
311
313
3113
3117
3115
3311
332
331
335
333
3513
351
3511
35
33
353

FIG. 3

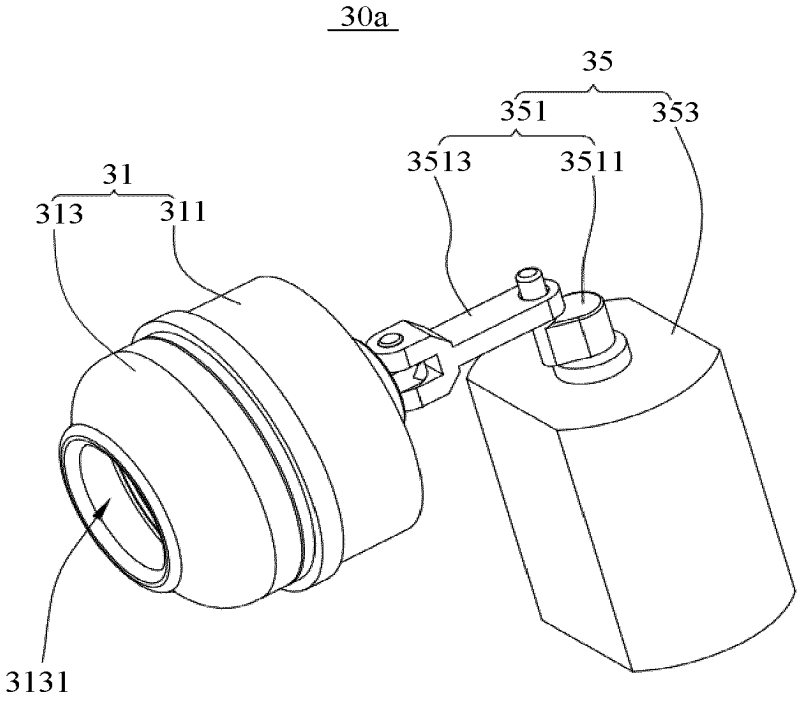


FIG. 4

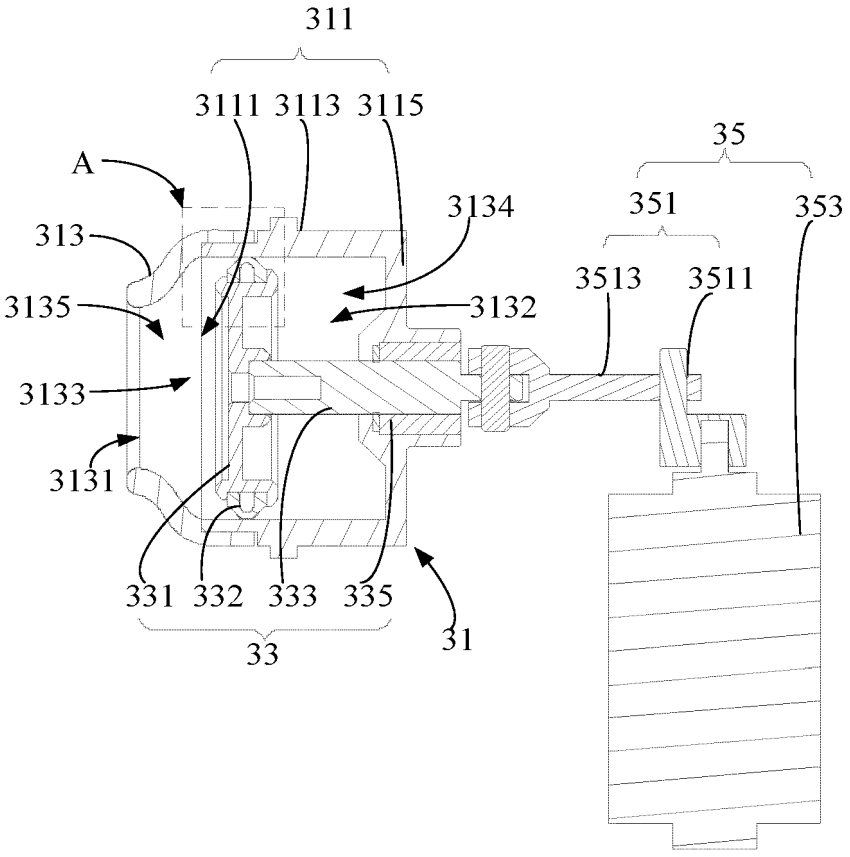

30a
311
3111
3113
3115
35
A
313
3134
351
353
3135
3513
3511
3132
3133
3131
331
332
333
335
31
33

FIG. 5

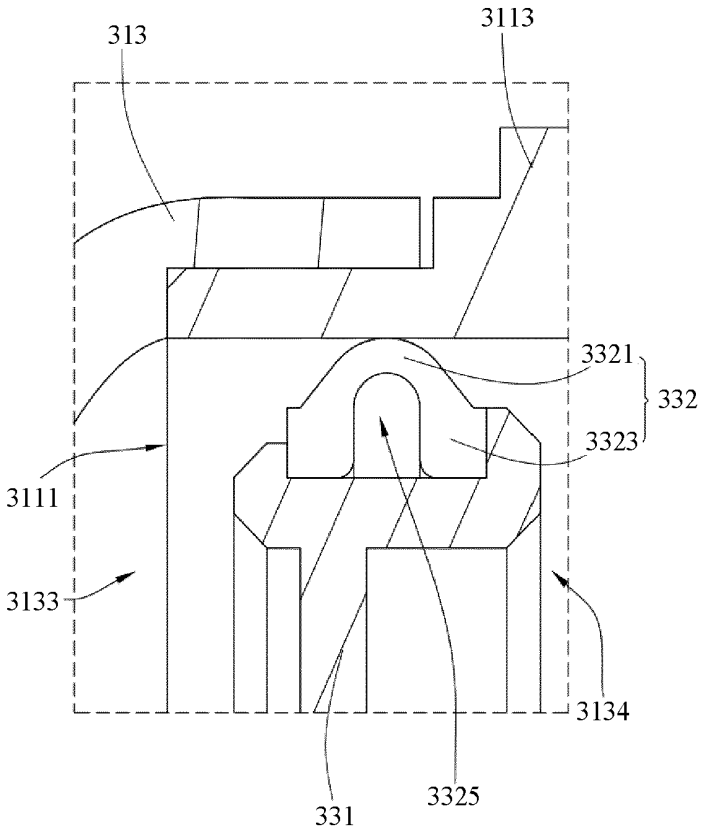

A
313
3113
3321
332
3323
3111
3133
3134
331
3325

FIG. 6

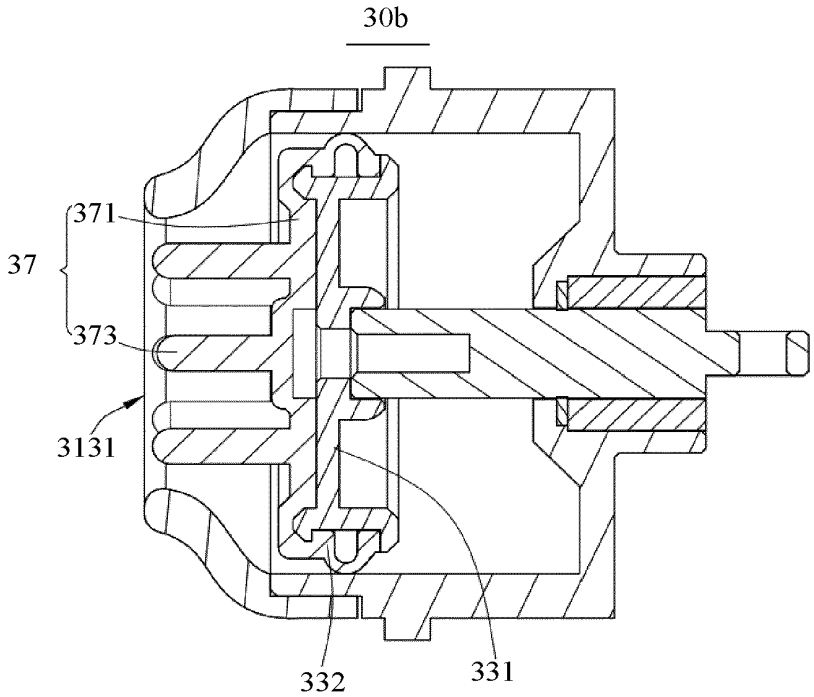

30b
371
37
373
3131
332
331

FIG. 7

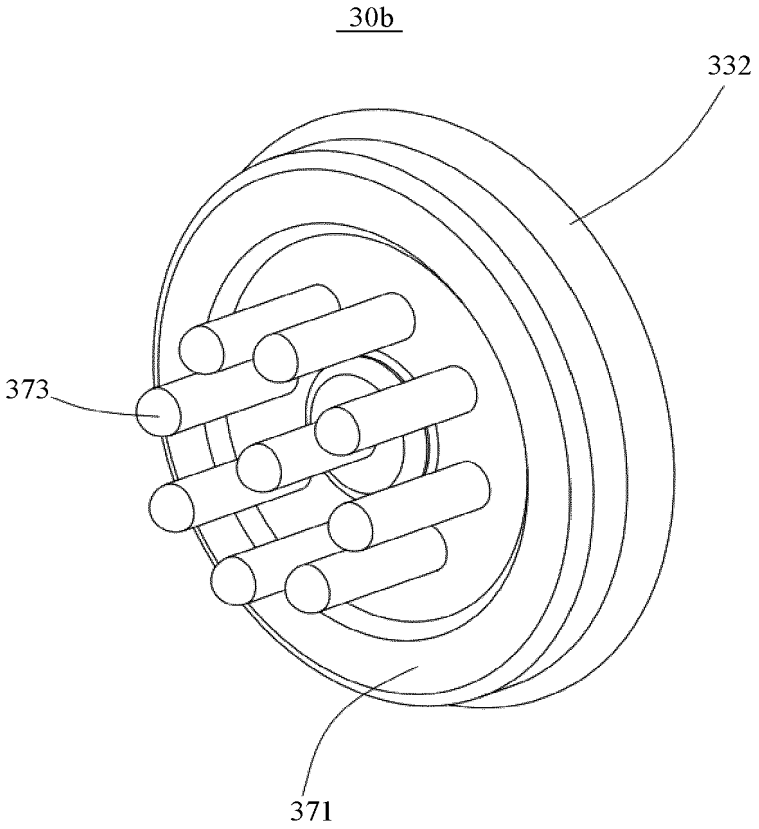


FIG. 8

30c

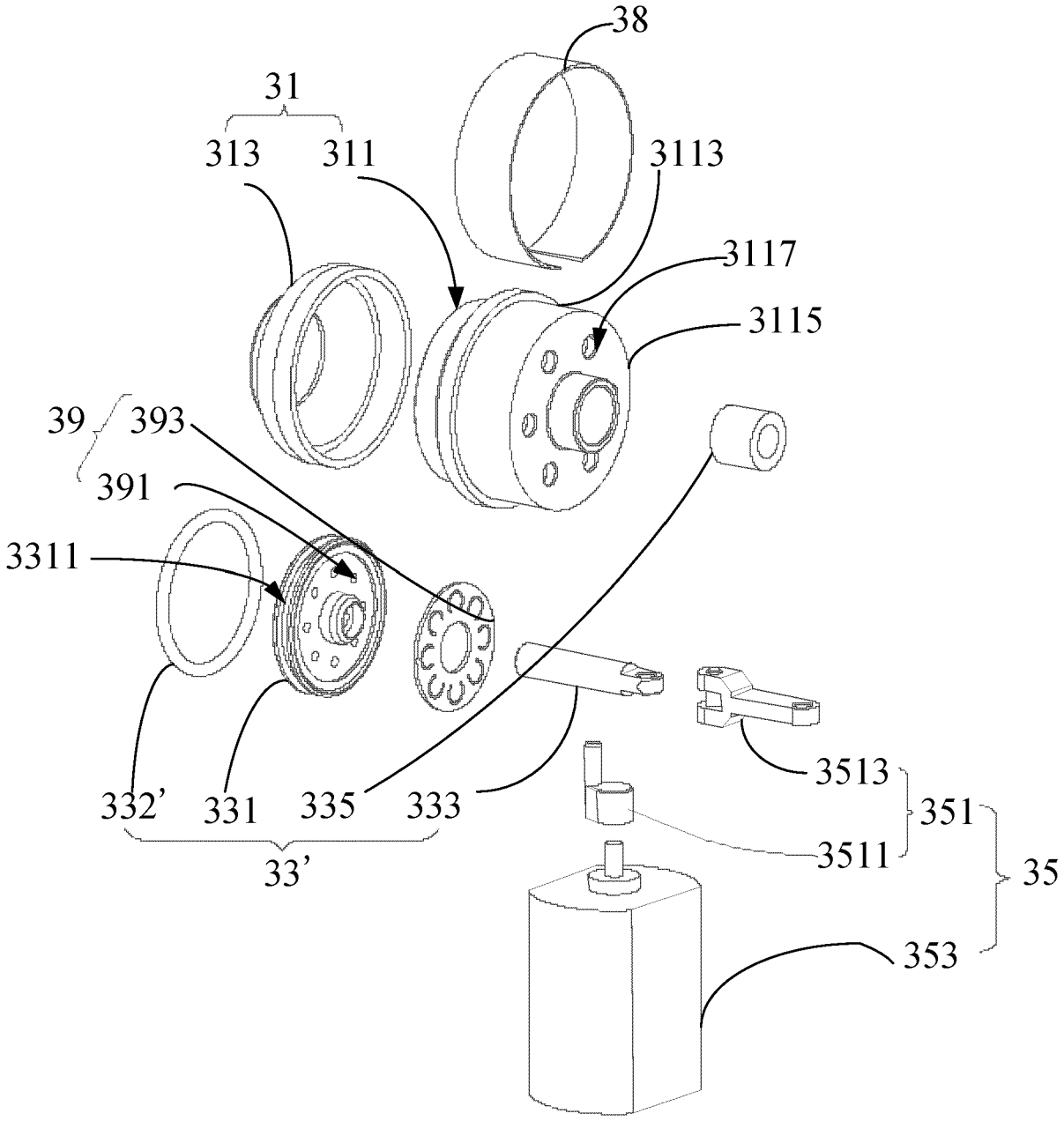

38
31
313
311
3113
3117
3115
39
393
391
3311
332'
331
335
333
33'
3513
351
3511
35
353

FIG. 9

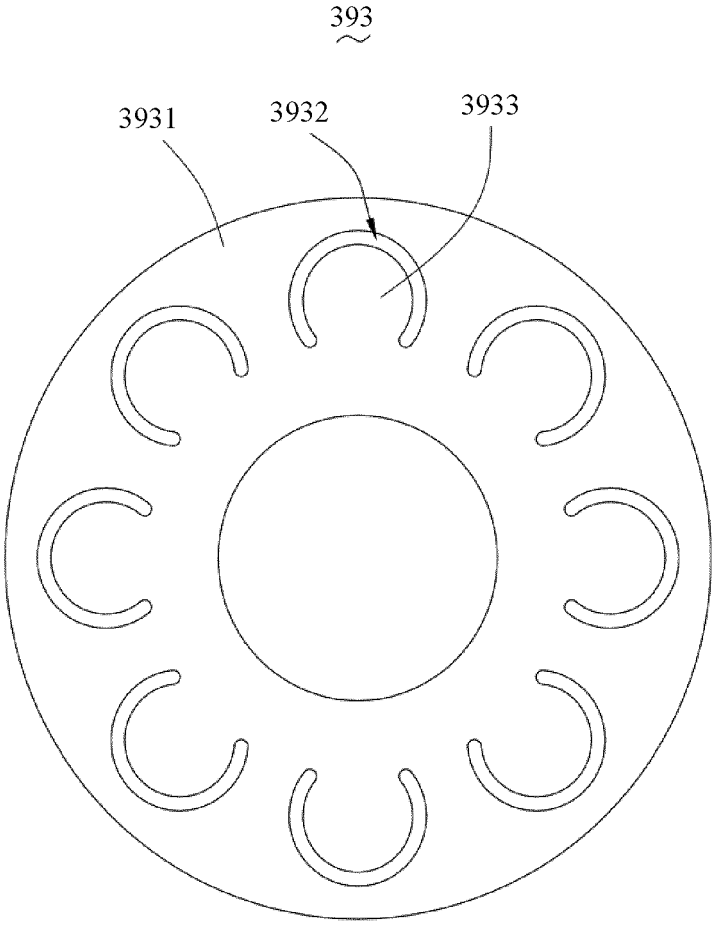


FIG. 10

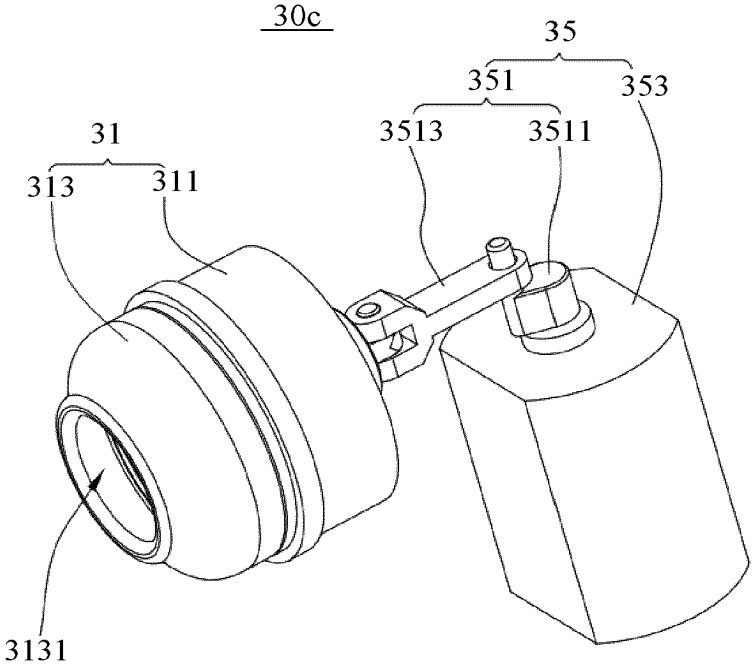
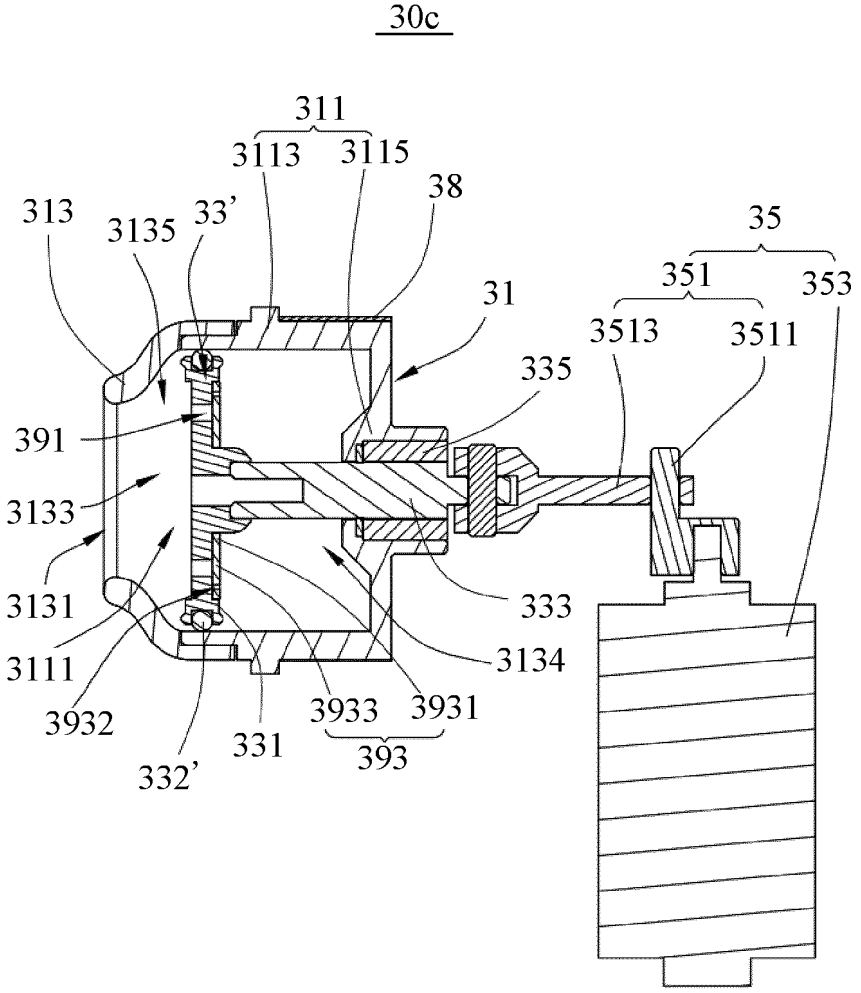


FIG. 11


30c
311
3113
3115
38
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3135
33'
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353
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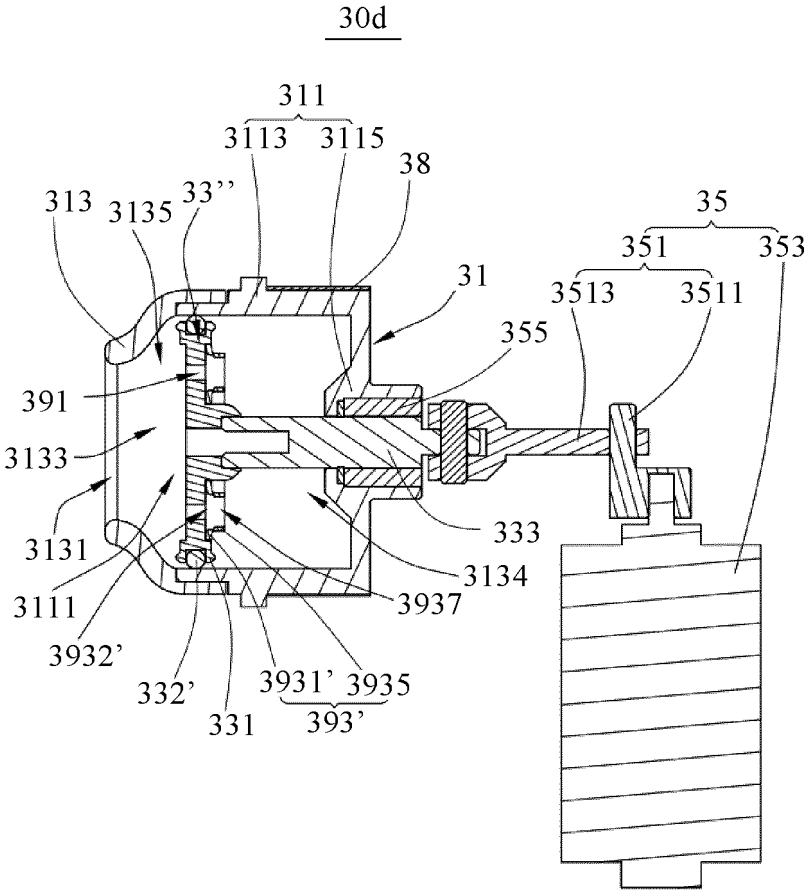
3131
333
3134
3111
3932
3933
3931
331
393
332'

FIG. 12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3511
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3111
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331
3931'
3935
393'
333
3134
3937

FIG. 13

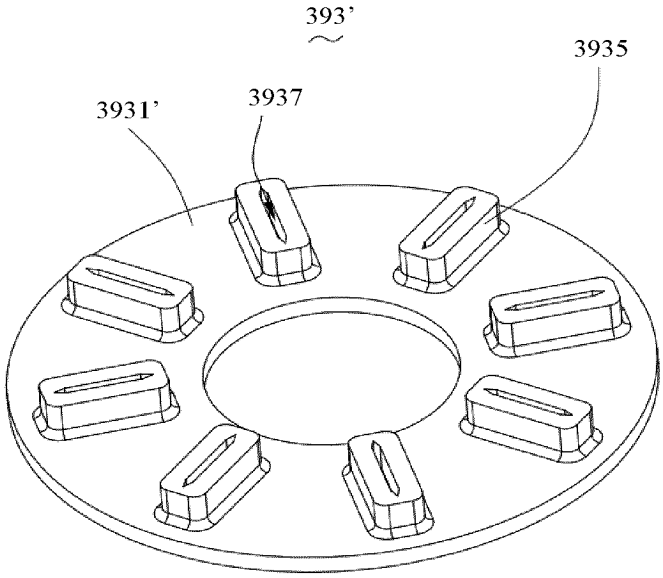

FIG. 14

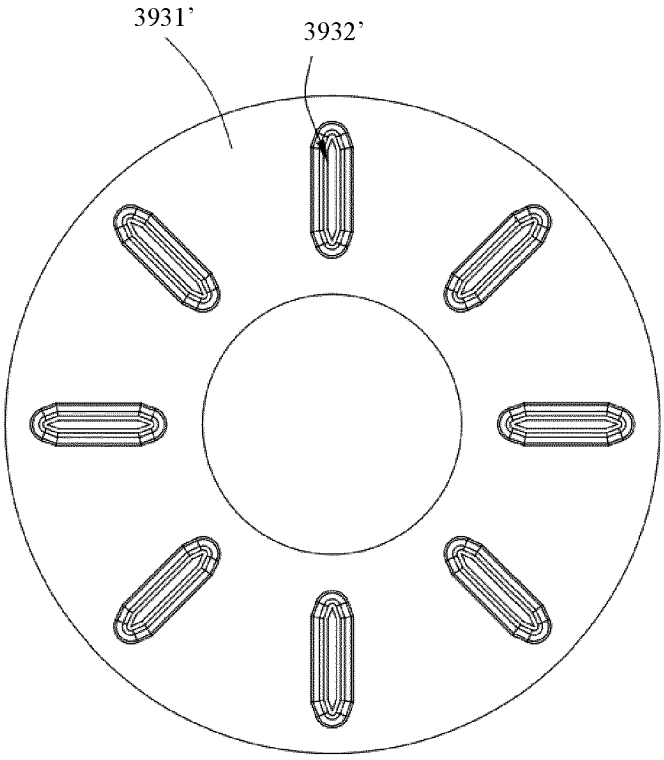

FIG. 15

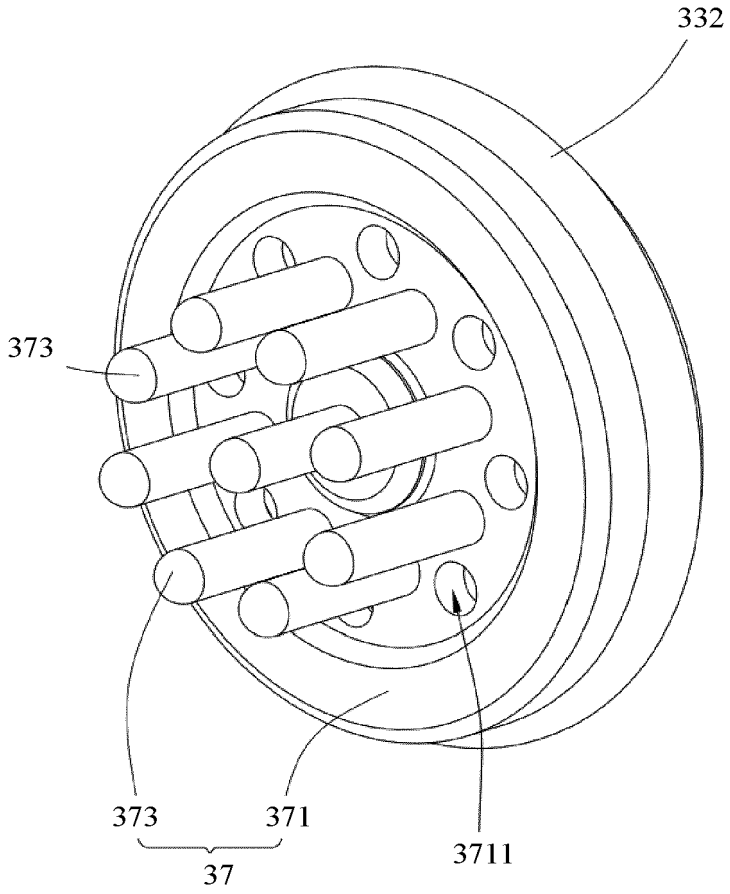

FIG. 16

100'

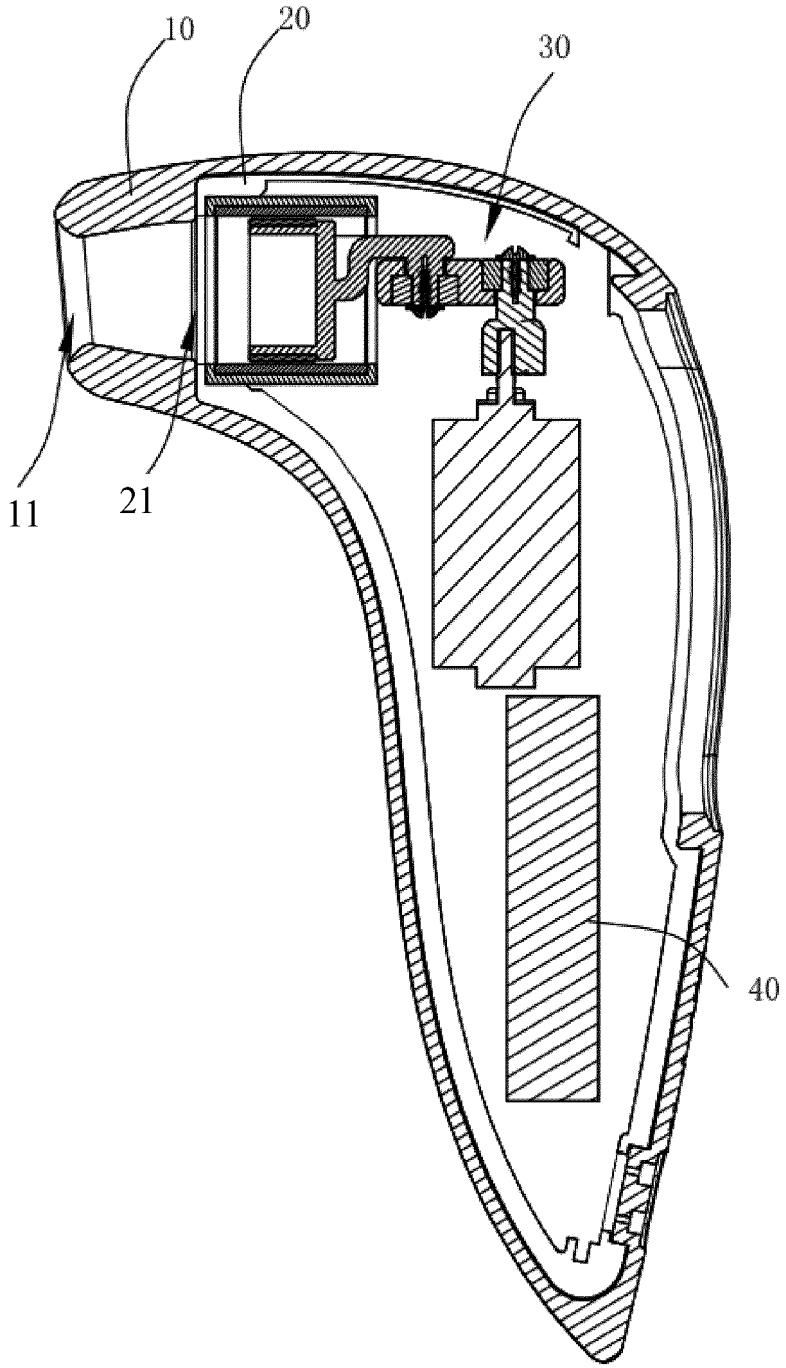

FIG. 17

30e

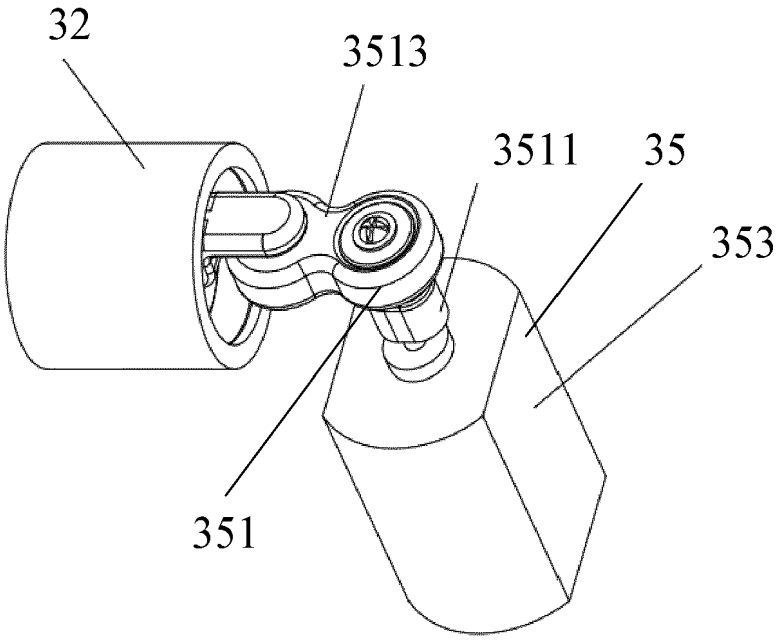

FIG. 18

30e

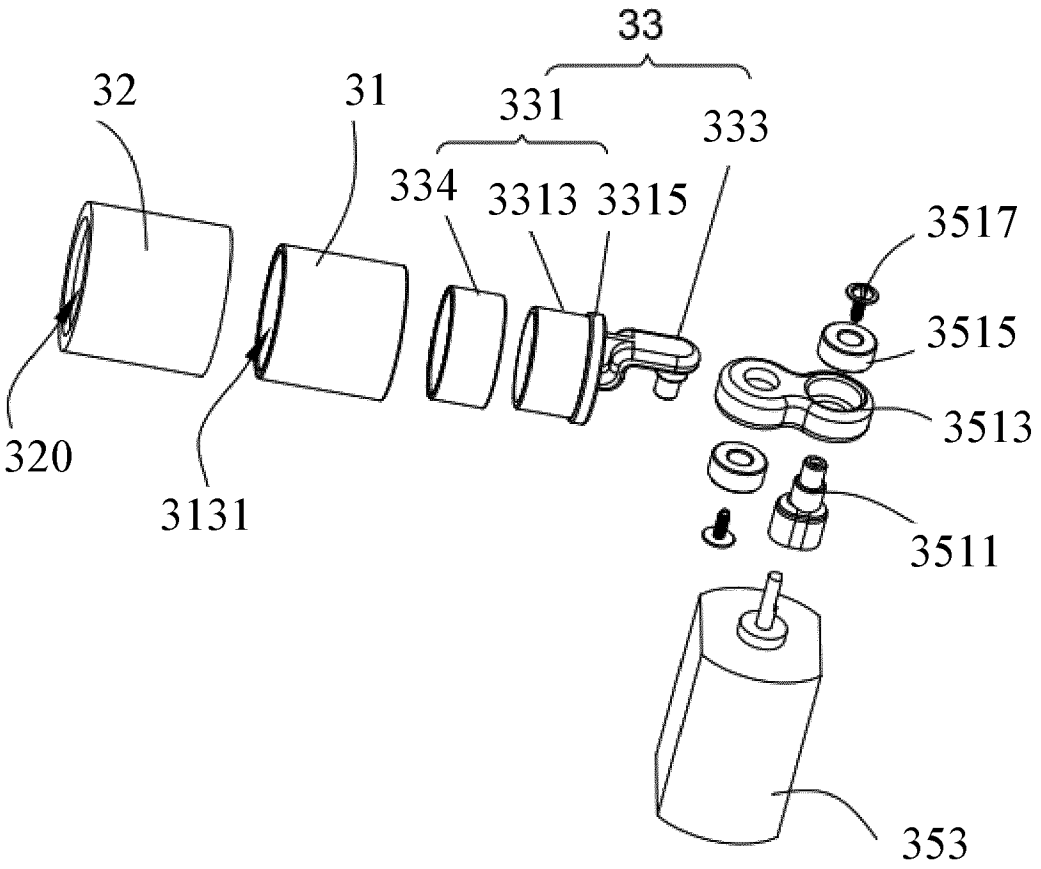

FIG. 19

30e

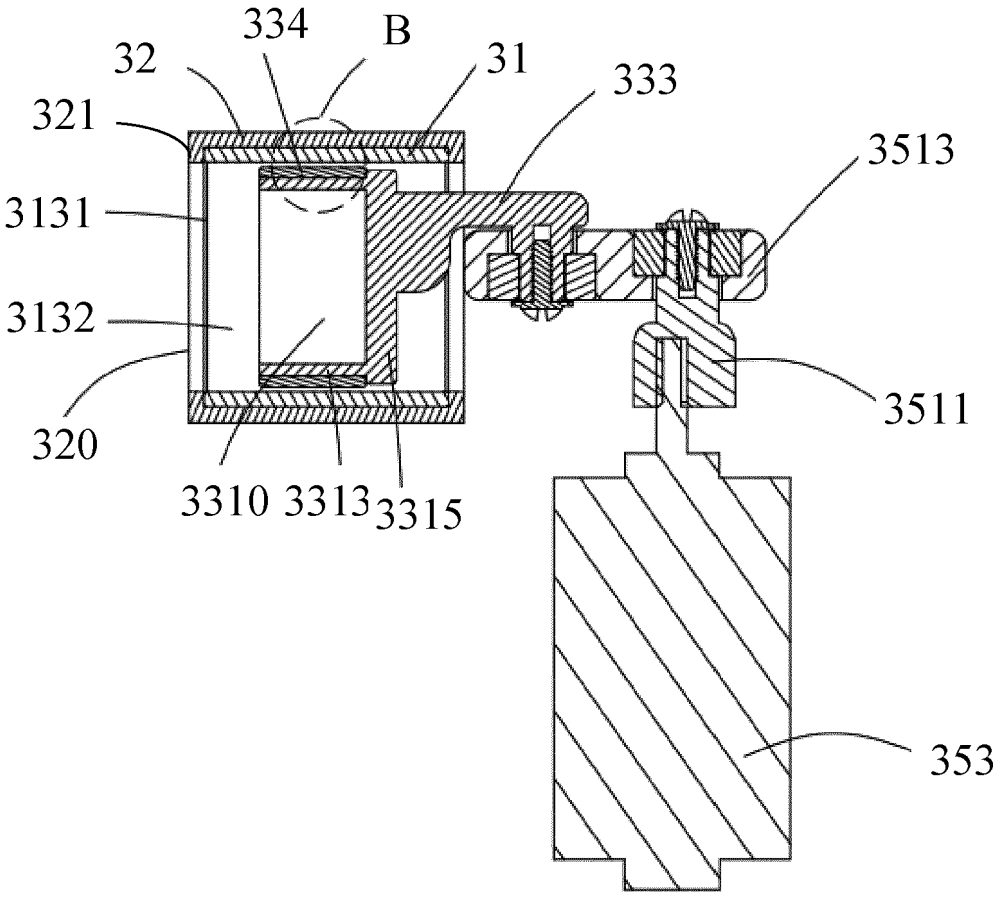

FIG. 20

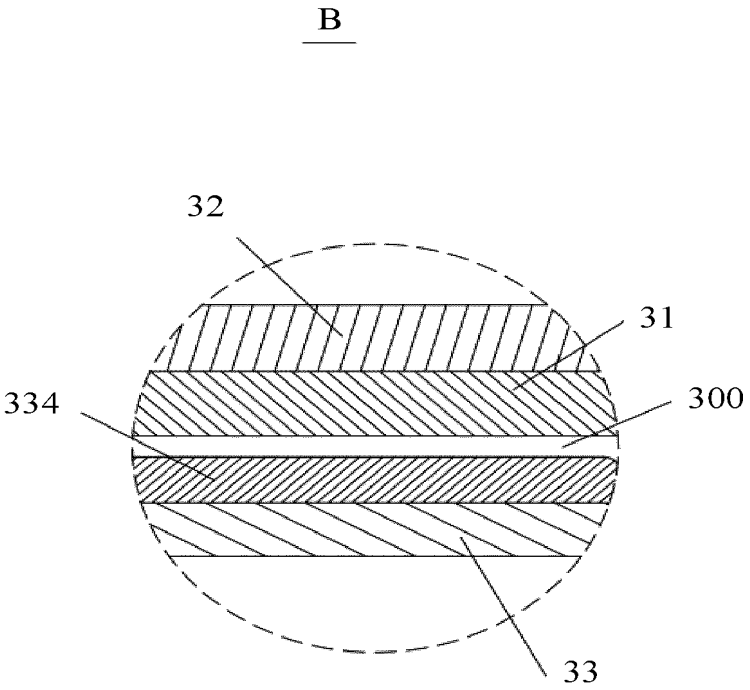

FIG. 21

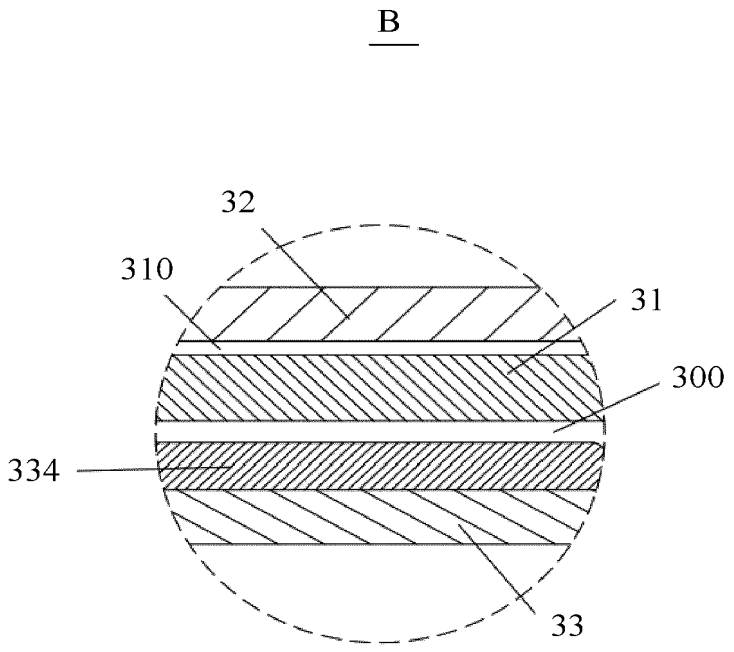

FIG. 22

30f

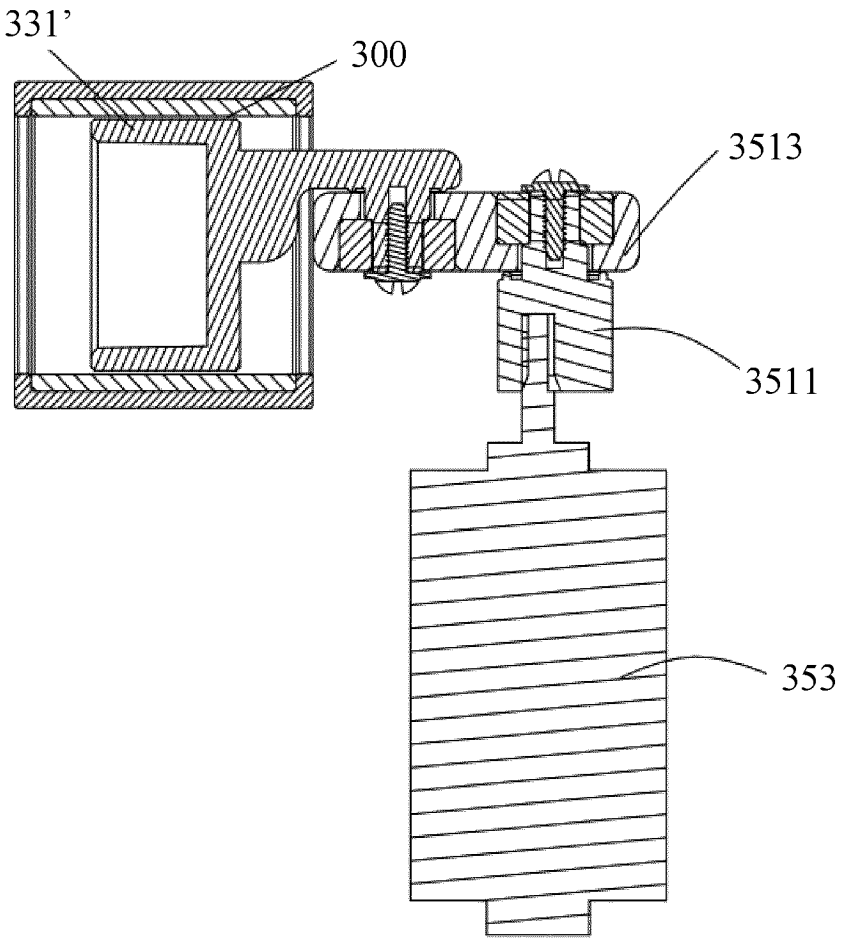

FIG. 23

30g

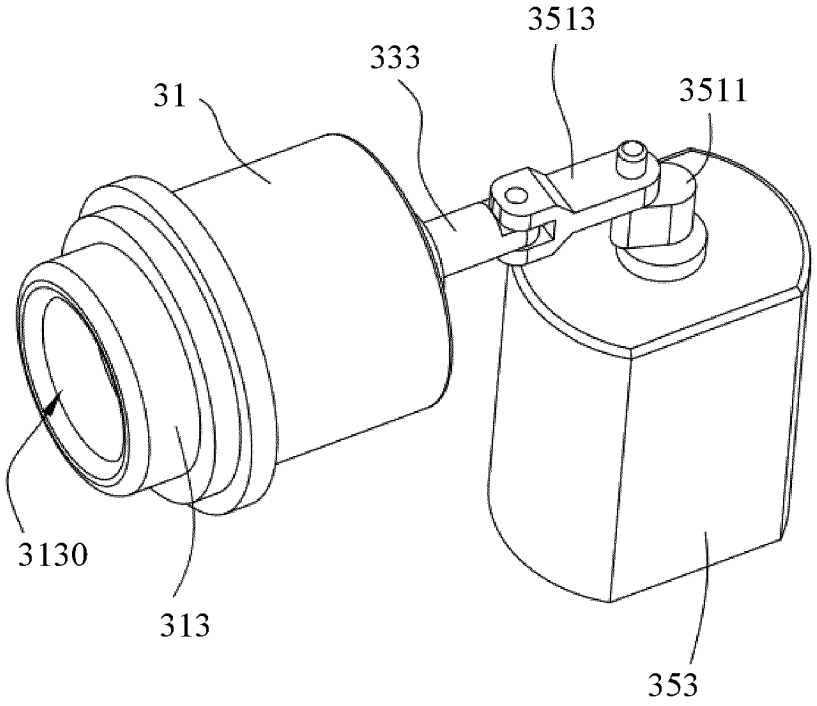

FIG. 24

30g

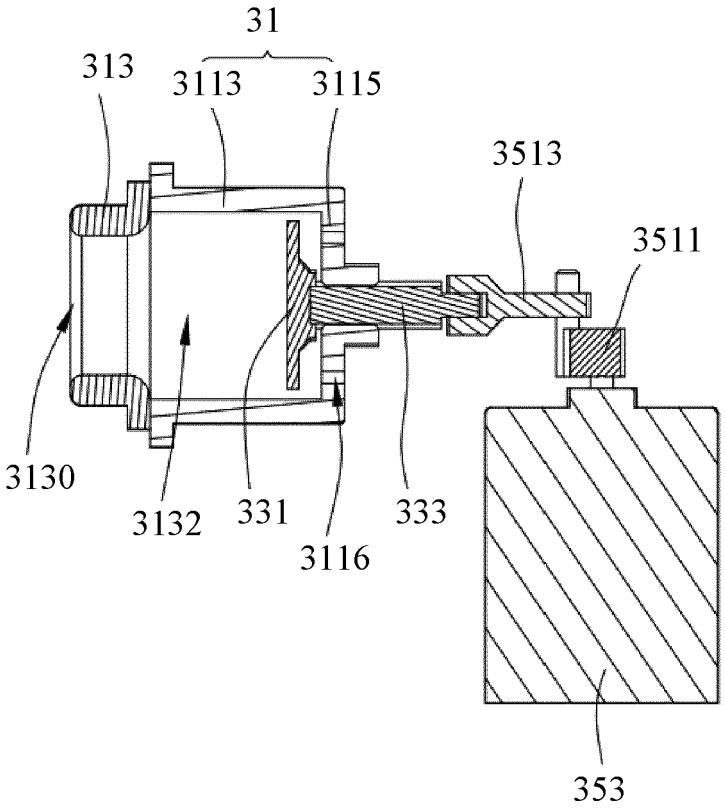

FIG. 25

30h

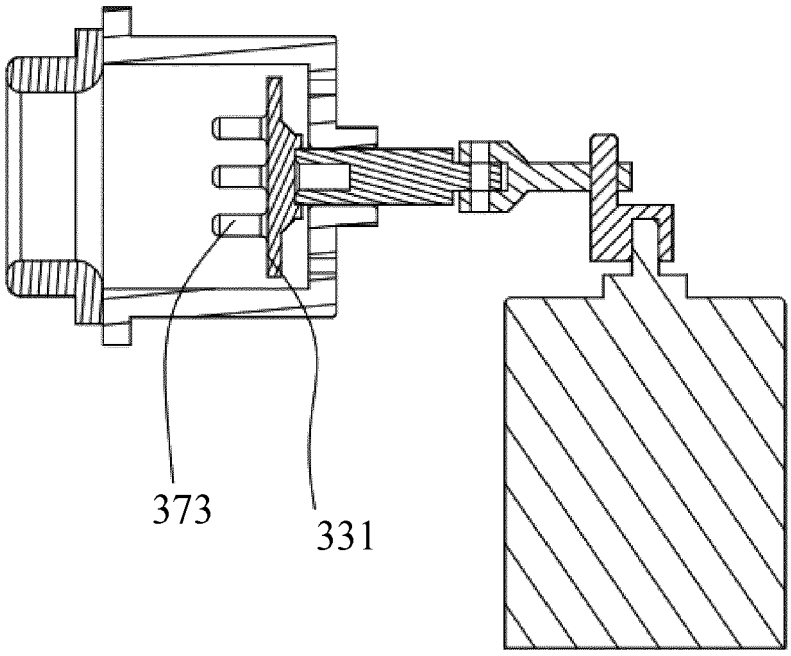

FIG. 26

REFERENCES CITED IN THE DESCRIPTION

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