Beautification Roller

DESCRIPTION

Technical Field

[0001]

The present invention relates to a beautification roller which is rolled on a skin surface to perform beautification and, more particular, to a technique applying a high-frequency current to perform beautification.

Background Art

[0002]

Various beatification rollers are known up to now. A user brings a freely rotatable roller part into contact with a skin surface while holding a beautification roller main body in her/his hand to perform beautification to a face, an arm, a leg, or the like. For example, in a beautification roller disclosed in Patent Literature 1, a handle part gripped by a user is bifurcated, and roller parts being in contact with a face or a body are attached to end portions of the bifurcated parts, respectively. Each of the roller parts has a long and narrow spherical shape and a triangular lattice pattern on the surface thereof. The roller part has a spherical shape having an elliptic section, and a rotating shaft is disposed at a position passing through the center of the section.

[0003]

A beauty apparatus disclosed in Patent Literature 2 includes a handle and a roller rotatably supported by the handle. Conductive parts are disposed on the outer peripheral surface of the handle and the outer peripheral surface of the roller, and the conductive parts are electrically insulated from each other. Inside the roller, a permanent magnet serving as an electric generating part generating electric power with rotation of the roller and a supply part supplying the generated electric power across the conductive parts of the roller are disposed. A beauty apparatus disclosed in Patent Literature 3 has the same shape as described above.

[0004]

A conventional high-frequency beauty treatment apparatus which conducts a high-frequency current to a skin of a face, a hand, a foot, or the like to perform anti-aging care for the skin, remedy pimples, and remedy a skin trouble such as pigmented spots or freckles is known (for example, see Patent Literature 4).

In particular, the present applicant, in Patent Literature 5, discloses a high-frequency beauty treatment apparatus which can cause a user to immediately feel an action or an effect of the high-frequency beauty treatment apparatus. This apparatus includes one pair of rotating electrodes disposed on a housing of the apparatus and having an exposed part to apply an electric stimulus by a high-frequency current to the muscle of a person to be treated, a heater disposed between the rotating electrodes on a treatment surface of the housing, a power supply supplying electricity to the heater and the electrodes, and the like.

Citation List

Patent Literature

[0005]

Patent Literature 1: Design Registration No. 1427467

Patent Literature 2: Japanese published unexamined application No. 2011-15874

Patent Literature 3: Design Registration No. 1387971

Patent Literature 4: WO 2011/162174

Patent Literature 5: Japanese published unexamined application No. 2014-113272

Summary of the Invention

Technical Problem

[0006]

In a conventional beautification roller, no configuration which rolls a rotor on a skin surface and applies a high-frequency current from the rotor to give a stimulus is provided. An optimal stimulus obtained by applying a high-frequency current together with a stimulus obtained by bringing a rotating rotor into contact with a skin surface while rotating, is not known.

[0007]

The present invention has been made in consideration of a problem of the conventional technique and has an object to provide a beautification roller which is rolled on a skin surface to perform beautification and which can apply an optimum high-frequency current.

Solution to Problem

[0008]

In order to solve the problem, the present invention provides the following beautification roller.

More specifically, there is provided a beautification roller which brings a rotor into contact with a skin surface and rotates the rotor and applies a high-frequency current to perform beautification, including a substantially rod-like main body part which includes rotatable support parts rotatably supporting rotating shafts of at least two rotors and disposed near an end portion and formed so that a longitudinal outer periphery can be gripped; two rotating shafts of the rotors protruding from the longitudinal direction of the main body in different directions with a predetermined opening angle; at least two rotors which have electrode parts freely rotating about the rotating shafts, respectively, and applying a high-frequency current to at least a portion brought into contact with the skin surface; and a high-frequency generating means electrically connected to the electrode parts to generate a high-frequency current.

[0009]

In the beautification roller, the high-frequency generating means is disposed in the main body part, and a configuration including a conducting means conducting a high-frequency current from the main body part to the rotating shafts and disposed in the rotatable support part can also be provided.

[0010]

The frequency of the high-frequency current is particularly preferably set to 0.5 MHz to 5.0 MHz. The output of the high-frequency current is particularly preferably set to 5 W to 35 W.

[0011]

The beautification roller includes a rotation detecting means detecting rotation of the rotor and can also control turning-on/off of the high-frequency current depending on detection results.

Effect of the Invention

[0012]

The present invention achieves the following advantage with the above configuration.

More specifically, in a beautification roller which brings the rotor into contact with a skin surface and rotates the rotor, a stimulus obtained by rotation of the rotor and a stimulus obtained by applying a high-frequency current are combined to each other to make it possible to obtain a preferable sense of use.

In particular, the frequency of the high-frequency current is caused to fall within the range of 0.5 MHz to 5.0 MHz and the output thereof is caused to fall within the range of 5 W to 35 W to make it possible to maximally improve the effect.

[0013]

When the high-frequency current is conducted, it is necessary to take an AC resistance or the like into consideration. However, in the rotatable support part, the conducting means conducting a high-frequency current from the main body part to the rotating shafts is configured as in the present invention, so that the high-frequency current generated by the main body part can be conducted to the rotor.

[0014]

Furthermore, the rotation detecting means for the rotor is disposed to make it possible to conduct a high-frequency current only when the rotor rotates, and the high-frequency current can be avoided from being locally applied to the skin surface.

Brief Description of the Drawings

[0015]

FIG. 1 is a perspective view of a beautification roller according to the present invention.

FIG. 2 is a perspective view of the beautification roller according to the present invention and a charging table.

FIG. 3 is a sectional view showing an internal mechanism of a roller body.

FIG. 4 is a schematic perspective view showing structures of a bearing member and a rotating shaft in the roller body.

FIG. 5 is a block diagram of the beautification roller according to the present invention.

Embodiment of the Invention

[0016]

An embodiment of the present invention will be described below with reference to an example shown in the drawings. The embodiment is not limited to the following description.

FIG. 1 is a perspective view of a beautification roller (1) according to the present invention. Near an end portion of a substantially rod-like main body (10), rotatable support part rotatably supporting rotating shafts of two roller bodies (20) and (21) serving as rotors are disposed. A user rolls the roller bodies (20) and (21) while bringing the roller bodies into contact with a face, an arm, a leg, or the like while gripping the outer periphery of the main body part (10).

[0017]

On the roller bodies (20) and (21), as shown in the drawings, pleated uneven surfaces (200) and (201) are formed in parallel with the directions of the rotating shafts. Beautification is performed with warm sensation and tactile sensation of a metal material by rolling the roller bodies (20) and (21) on the skin surface, vibration by the uneven surfaces (200) and (201), a pressure obtained when the roller bodies (20) and (21) are brought into contact with the skin surface, and application of a high-frequency current according to the present invention.

[0018]

On the outer peripheries of the equatorial portions of the roller bodies (20) and (21), ring-like first ring parts (202) and (212) are disposed, respectively. On outer peripheries near one

ends, ring-like second ring parts (203) and (213) are disposed, respectively. A high-frequency current according to the present invention can be applied from the first ring parts (202) and (212) or the second ring parts (203) and (213) to the skin surface.

[0019]

In the present invention, the shapes of the rotors can be arbitrarily set, and are not limited to the roller bodies (20) and (21) as described in the embodiment. For example, the shape may be an ellipsoidal body having a long diameter in the direction of the rotating shaft or having a short diameter in the direction of the rotating shaft, a substantial columnar shape, a substantially polygonal-columnar shape, a substantially conical shape, a substantially polygonal-conical shape, a barrel shape, or the like, and is not limited to a specific shape.

[0020]

At least two rotors need only be disposed. Two or more, for example, four rotors may be disposed at one end of the main body part (10), or two rotors may be disposed on each of both the ends of the main body part (10). The rotors need not have the same shapes and equal sizes, and all the rotors may have shapes different from each other and sizes different from each other. Or, the two pairs of rotors may have shapes different from each other and sizes different from each other.

[0021]

The beautification roller (1) according to the embodiment includes a chargeable battery disposed in the main body part (10). The beautification roller (1) is configured such that, when the beautification roller (1) is placed on a charging table (2) shown in FIG. 2, the charging terminals (not shown) of the main body part (10) are in contact with contact points (not shown) of the charging table (2) to electrically charge the chargeable battery. Furthermore, the charging table (2) is configured such that a power adapter (not shown) or the like is connected to the beatification roller (1) to supply electric power thereto.

[0022]

The internal mechanisms of each of the roller bodies (20) and (21) will be described below with reference to FIG. 3 and FIG. 4. Although the explanation will be executed by using the roller body (20) on one side, the other roller body (21) has the same internal mechanism.

An outer shell configuring a large part of the outer peripheral surface of the roller body (20) includes a first outer shell part (204), a second outer shell part (205), and a third outer shell part (206). A seam between the first outer shell (204) and the second outer shell (205) is fixed by the second ring part (203), and a seam between the second outer shell part (205) and the third outer shell part (206) is fixed by the first ring part (202).

[0023]

On the joint side of the roller body (20) formed as described above, a hole (206a) in which a rotating shaft (110) protruding from a rotatable support part (11) or (12) of the main body part (10) is fitted is formed. A bearing member (130) as shown in FIG. 4 is fitted in the hole (206a). The bearing member (130) is fitted and then fixed in the roller body (20) such that the distal end portion is screwed into the second ring part (203) by a screw (131).

[0024]

The bearing member (130) has a cylindrical inside. A first bearing (132), a bearing stopper (133), a spacer (134), a contact point fixing member (135), and a second bearing (136) are sequentially inserted into the bearing member (130) from the distal end thereof. Finally, the bearing member (130) is screwed with a sealing screw (137). In this manner, the roller body (20) is freely rotatable with respect to the rotating shaft (110), and is not detached from the rotating shaft (110).

[0025]

In the embodiment, the rotating shafts of the roller bodies (20) and (21) are decentered. This configuration will be described below. As shown in FIG. 3, an axial direction (L1) of the rotating shaft (110) is not arranged at the central axis of the roller body (20), but is inclined from an axial direction (L2) of the rotating shaft (110). Usually, the rotating shaft is aligned to the central

axis to rotate the outer periphery of the roller body (20) at a predetermined position in a rotation state. Also in a conventional beautification roller, a rotating shaft is aligned to a central axis, and the uneven surface of a roller body gives a stimulus to a skin surface.

[0026]

On the other hand, in the beatification roller according to the embodiment, since the rotating shaft is inclined from the central axis, when the beautification roller is rolled on a skin surface, twisting motion occurs in the roller body (20), and a gap between the two roller bodies (20) and (21) periodically changes to nip the skin and to cause a stretching effect to intermittently occur. In this configuration, without using a vibration device or a driving device, the roller bodies naturally irregularly vibrate with rolling by a user so as to contribute to the easy handling and the light weight of the beautification roller.

[0027]

When the outer periphery of the roller body (20), as described above, includes pleated uneven surfaces (200) and (201) parallel with the rotating shaft, the roller body (20) gives fine vibration to the skin surface a number of times which is equal to the number of pleats while the roller body (20) rotates once, and large twist can be given while the roller body (20) rotates once. In the beautification roller, stimulus to a skin surface is a very important function and shows a characteristic behavior which cannot be achieved by a conventional beautification roller. For example, since large twist exerts an effect which lifts up a skin, a massage effect for a skin or a muscle at a problem area such as a sagging area can be improved.

[0028]

The embodiment shows a configuration in which the axial direction of the rotating shaft is inclined from the central axis of the roller body. However, the central position on a section vertical to the axial direction of the rotating shaft can also be disposed to be partially at least decentered from the position of the rotating shaft.

For example, a configuration in which the axial direction of the rotating shaft is made parallel with the central axis to decenter the positions from each other may also be used.

[0029]

According to the present invention, the beautification roller including at least two rotors as described above is characterized in that a high-frequency current is applied from the electrode parts disposed on the rotors to the skin surface of a user. FIG. 5 shows a block diagram of the beautification roller. A power supply part (50) configured by the power adapter described above or the like electrically charges a chargeable battery (51) in the main body part (10). Power supply from the chargeable battery (51) causes a high-frequency generating circuit (52) serving as a high-frequency generating means in the main body (10) to generate a high-frequency current.

As a matter of course, the chargeable battery (51) need not be used in the present invention, and electric power may be directly supplied from an external power supply part (50) to the high-frequency generating circuit (52). Moreover, a solar panel may be disposed on the main body part (10) to supply electric power by photovoltaic generation.

[0030]

A high-frequency current is conducted from the high-frequency generating circuit (53) to the rotating shaft (110) through rotatable support parts (11) and (12). Obviously, contact portions between the rotatable support parts (11), (12) and at least the rotating shafts (110), and the rotating shafts (110) are made of a conductive material.

A contact point member (140) fixed by a contact point fixing member (135) of the bearing member (130) is in contact with the outer peripheral surface of the rotating shaft (110). The contact point member (140) is a conductive leaf-spring-shaped member, a contact part (140a) presses the rotating shaft (110) by the elasticity of the spring, and a proximal-end part (140b) is electrically connected to the bearing member (130). For this reason, even though the rotor rotates relatively to the rotating shaft (110), electricity can be conducted from the rotating shaft (110) to the bearing member (130).

[0031]

Since the bearing member (130) is further electrically connected to the second ring part (203) fixed by a screw (131), a high-frequency current can be applied from the second ring part (203). Since the high-frequency current is conducted between one of the roller body (203) serving as one of the roller bodies and the other roller body through the skin surface, the high-frequency current can act on a skin between the electrodes.

[0032]

The conducting means according to the present invention optimally has the configuration of the contact point member (140) as described above in consideration of a reactance for a high-frequency current. However, a conductive bearing or a brush-like contact point may be used.

A configuration in which the high-frequency generating circuit (52) is disposed inside the roller body to supply electric power from the main body part (10) to the roller body (20) may be used.

[0033]

The electrode part according to the present invention is not limited to the second ring part (203), and may be the first ring part (202) or the entire outer peripheral surface of the roller body (20). The configuration for conducting is not limited to the configuration in which electricity is conducted between the roller bodies (20) and (21) and may be a configuration in which electricity is conducted between the first ring part (202) and the second ring part (203). In addition, disposition places of the electrode parts and an electric conducting section are arbitrarily set.

[0034]

(Another Embodiment)

The beautification roller according to the present invention can also further include a conductivity control part (53) and a rotation detecting part (54). In this embodiment, the rotation detecting part (54) is disposed in the roller body (20), and the conductivity control part (53) is disposed in the main body part (10).

The rotation detecting part (54) is configured by a known rotation sensor detecting relative rotational motion between the bearing member (130) of the roller body (20) and the rotating shaft (110). As the detecting method, in addition to a method in which a small electric generator is attached to the rotating shaft to detect a current obtained by electric generation, arbitrary methods such as a known electromagnetic-type method, a magnet-type method, an optical sensor, and a gyro sensor can be used.

[0035]

When the rotation detecting part (54) detects rotation, the conductivity control part (53) controls turning on/off of a high-frequency current depending on the detection results. Turning on/off of an output from the high-frequency generating circuit may be controlled, or turning on/off of power supply itself to the high-frequency generating circuit may be controlled.

The conductivity control part (53) may be disposed in the roller body (20) to control an output from the electrode part (140) only when the rotation detecting part (54) detects the rotation.

A light-emitting means may be configured to be disposed in the main body part (10) or the roller body (20) to emit light only when a high-frequency current is conducted.

[0036]

As described above, by using the rotation detecting part (54), the high-frequency current can be conducted when the roller bodies (20) and (21) rotate. It is known that, when the high-frequency current is applied on a skin surface, a current-conducting portion is heated. Therefore, if the current is excessively continuously conducted, a user may become uncomfortable. Thus, in the present invention, a current is conducted only when a user uses the beatification roller by rotating the roller bodies (20) and (21) to contribute to improvement on usability.

This configuration has a special advantage of avoiding a current from being locally conducted because contact portions of the skin surface change when the roller bodies rotate.

[0037]

In place of the rotating detecting means, vibration of the main body part (10) may be detected to apply a high-frequency current only when the vibration is detected. For vibration detection, a know vibration sensor can be used. Also in this case, since a current is conducted by detecting vibration when the beautification roller is in use, the current can be avoided from being continuously conducted when the beautification roller is not in use.

[0038]

In the present invention, with respect to a high-frequency current to be applied from the beautification roller, preferable frequencies and preferable outputs were obtained by an experiment. Experimental examples will be described below.

(Experimental Example 1)

The beautification roller shown in the embodiment described above was used, and a high-frequency current conventionally usually used and having a frequency of 1.0 MHz was applied at each of the following outputs. Ten examinees performed sensory evaluation at outputs of 2 W to 40 W and ranked the beautification rollers as inappropriate (0 point), appropriate (1 point), and optimum (2 points). Zero point to less than 1 point of an average point was evaluated as △, 1 point to less than 1.5 points was evaluated as ○, and 1.5 points to less than 2 points was evaluated as ◎. The results were compiled to obtain the following table.

[0039]

[Table 1]

(Sensory evaluation results depending on outputs)

Output (W)	Evaluation
2	△
5	○
10	◎
15	◎
20	○
25	○
30	○
35	○
40	△

[0040]

According to the above experiment, a sufficient effect could not be obtained when the output is 2 W, and stimulus was excessively strong when the output was 40 W. Thus, in the beautification roller according to the present invention, it was understood that the output of the high-frequency current to be applied was optimally 10 W to 15 W and a range of 5 W to 35 W was a preferable output range.

Thus, in the present invention, the output of the high-frequency current is preferably set within the range of 5 W to 35 W.

[0041]

(Experimental Example 2)

The beautification roller shown in the embodiment was sequentially used, and a high-frequency current having an output of 10 W determined as an optimum output in Experimental Example 1 was applied at each of the following frequencies. Ten examinees performed sensory evaluation at frequencies of 0.1 MHz to 10.0 MHz and ranked the beautification rollers as inappropriate (0 point), appropriate (1 point), and optimum (2 points). Zero point to less than 1 point of an average point was evaluated as △, 1 point to less than 1.5 points was evaluated as ○, and 1.5 points to less than 2 points was evaluated as ◎. The results were compiled to obtain the following table.

[0042]

[Table 2]

(Sensory evaluation results depending on frequencies)

Frequency (MHz)	Evaluation
0.1	△
0.3	○
0.5	◎
1.0	◎
2.0	◎
3.0	◎

4.0	○
5.0	○
10.0	△

[0043]

According to the above experiment, a sufficient effect could not be obtained when the frequency is 0.1 MHz, and the effect at the frequency of 10.0 MHz was not sufficient. Thus, in the beautification roller according to the present invention, it was understood that the frequency of the high-frequency current to be applied was optimally 0.5 MHz to 3.0 MHz and a range of 0.5 MHz to 5.0 MHz was a preferable frequency range.

Thus, in the present invention, the output of the high-frequency current is preferably set within the range of 0.5 MHz to 5.0 MHz.

List of Reference Signs

[0044]

1 ... beautification roller

10 ... main body part

11 ... rotatable support part

110 ... rotating shaft

202 ... first ring part

203 ... second ring part

12 ... rotatable support part

120 ... rotating shaft

212 ... first ring part

213 ... second ring part

20 ... roller body

21 ... roller body

CLAIMS

1. A beautification roller which brings a rotor into contact with a skin surface and rotates the rotor and applies a current in the frequency of 0.5 MHz to 3.0 MHz and the current of 10 W to 35 W to perform beautification, comprising:

a substantially rod-like main body part which includes rotatable support parts rotatably supporting rotating shafts of at least two rotors and disposed near an end portion and formed so that a longitudinal outer periphery can be gripped;

two rotating shafts of the rotors protruding from the longitudinal direction of the main body in different directions with a predetermined opening angle;

at least two rotors which have electrode parts freely rotating about the rotating shafts, respectively, and applying a high-frequency current to at least a portion brought into contact with the skin surface; and

a generating means electrically connected to the electrode parts to generate a the current; said high frequency generating means provided in the main body for energizing the electrode unit to generate a high-frequency current, and comprising a conduction part that supplies the high-frequency current from the main unit to the rotating shaft in the shaft support unit; the electrode is portion formed in a ring shape on the outer periphery along the rotation direction of the rotating body;

wherein a fold-shaped uneven surface is formed on a surface of the rotating body in parallel with a direction of a rotation shaft.

2. The beautification roller as claimed in claim 1, wherein the roller is disposed of ring like first ring parts are disposed on outer peripheries of an equatorial portion of the roller bodies, and the frequency current can be applied from the first ring parts.

3. The beautification roller as claimed in claim 1, wherein the roller is disposed of ring like second ring parts are disposed on an outer peripheries of an equatorial portion of the roller bodies, and the frequency current can be applied from the second ring parts.

4. The beautification roller as claimed in any one of claims 1 to 3, wherein in the beautification roller, rotation sensor or vibration sensor, which detect rotation of the rotor is disposed as rotation detecting means, and turning on/off of the frequency current is controlled depending on detection results.

FIG. 1

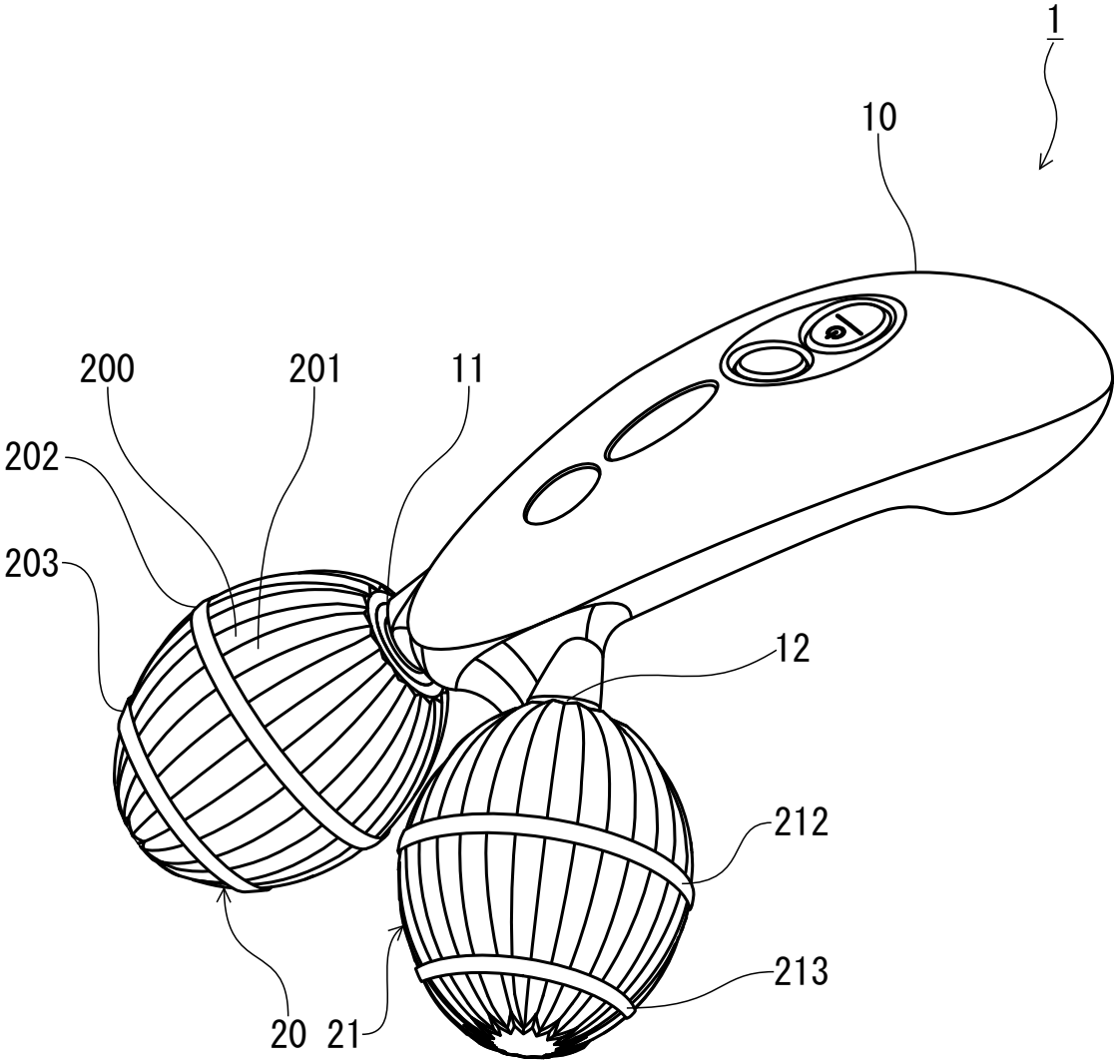


FIG. 2

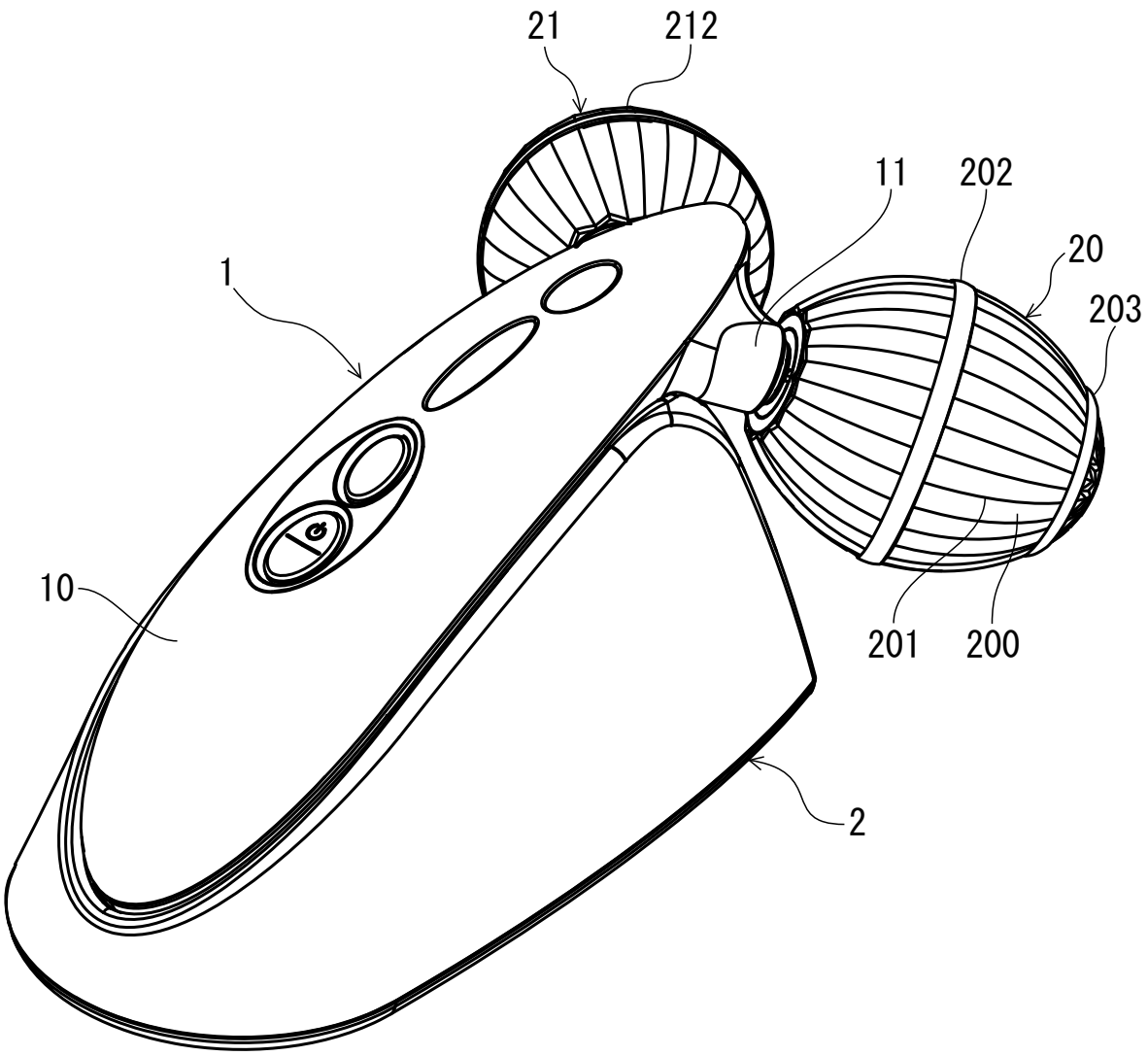


FIG. 3

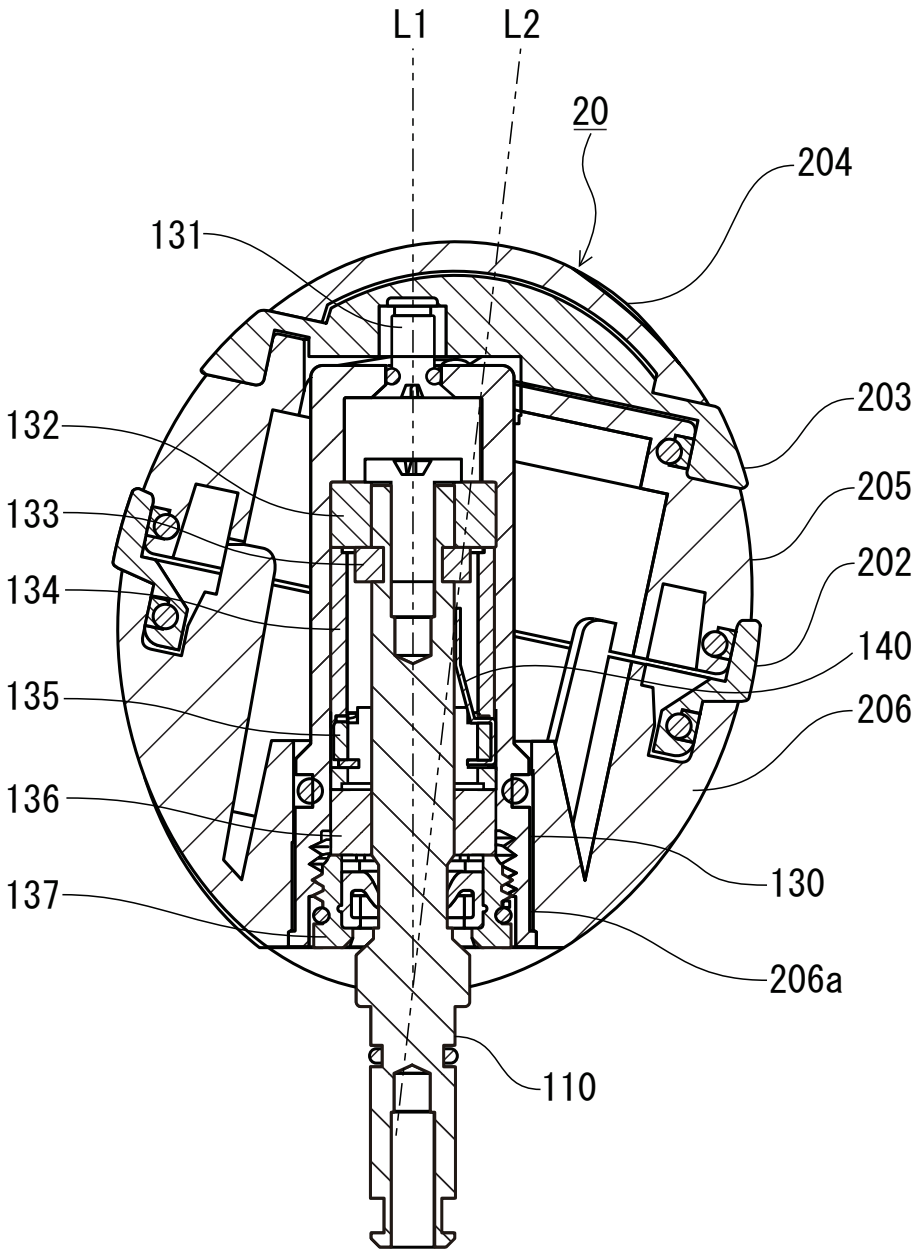

L1
L2
20
204
131
203
132
205
133
202
134
140
135
206
136
130
137
206a
110

FIG. 4

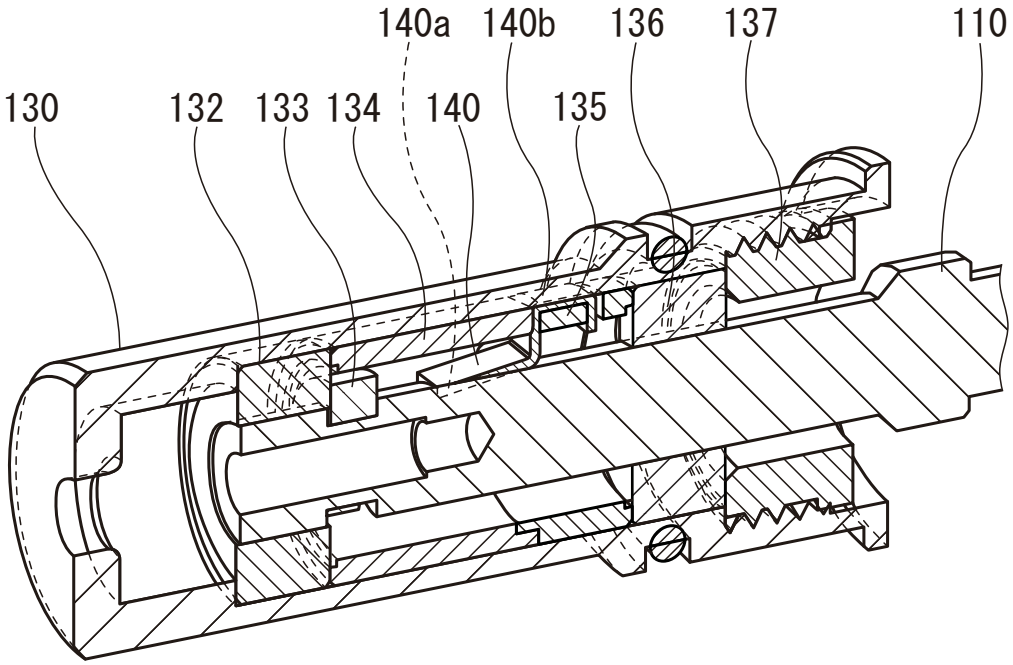
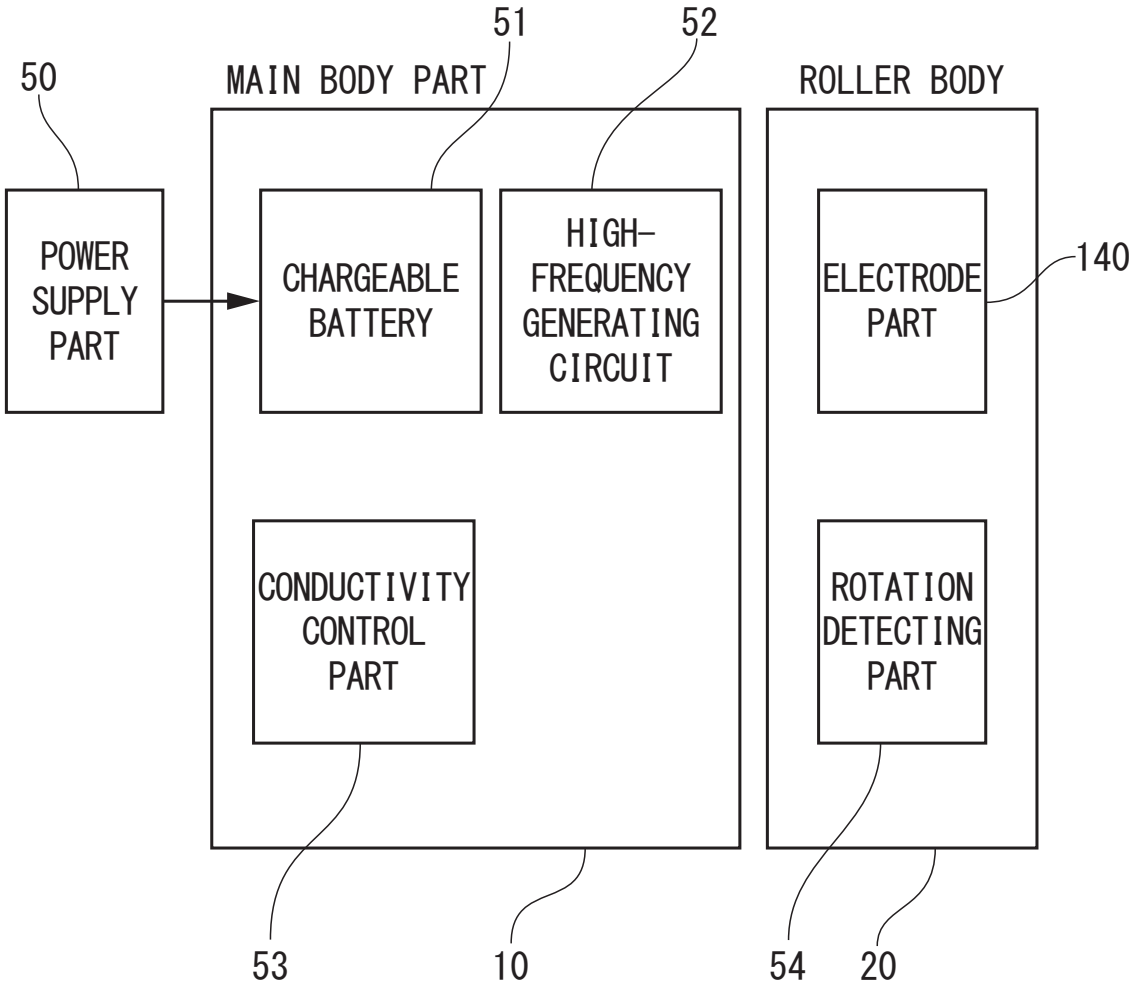


FIG. 5


50
MAIN BODY PART
51
52
ROLLER BODY
POWER SUPPLY PART
CHARGEABLE BATTERY
HIGH-FREQUENCY GENERATING CIRCUIT
ELECTRODE PART
140
CONDUCTIVITY CONTROL PART
ROTATION DETECTING PART
53
10
54
20