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(54) **Showerhead structure having functions of temperature sensing and micro-hydro-electric power generating**

Duschkopfstruktur mit Funktionen der Temperaturmessung und Erzeugung von mikro-hydroelektrischem Strom

Structure de pommeau de douche doté de fonctionnalités de détection de la température et de génération d'énergie micro-hydroélectrique

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## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

[0001] The invention relates to a showerhead structure having functions of temperature sensing and micro-hydro-electric power generating, and more particularly, to a showerhead structure having functions of temperature sensing and micro-hydro-electric power generating making use of the water-flow to drive the dynamic element to generate electricity for making the light-emitting elements illuminate different colors of light to achieve the objectives of having the functions of temperature warning and intensifying the visual effect.

#### 2. Description of the Prior Art

[0002] In general, most of the conventional showerhead structure has the design variation on the water outlet mouth making it generate various water sprays. Thereafter, due to the development of technology, the showerhead structure evolves into various massage (spa) showerheads that are capable of controlling the variation on the water flow and water pressure. However, when it comes to using the showerhead, depending on whether or not it is in normal operation, the water heater will generate different instantaneous water temperature. If the instantaneous water temperature is too high, the user is apt to be scalded with the hot water. Therefore, the idea of having the function of temperature sensing is generated.

[0003] The US patent application No. 11/980,944 (laid-open publication US 2008/0061557A1) and the US patent application No. 11/981,353 (laid-open publication US 2008/0061558A1) respectively disclose the generation of power source by making use of a micro-hydro-electric power generating device and utilizing the power source on the water quality filtering structure of water screening program. The prior art stresses mainly on the improvement of the turbine blade structure of the micro-hydro-electric power generating structure and is used on the screening program connected to the general faucet, and is not used on the water temperature sensing and warning. What is more, this idea of micro-hydro-electric power generating is a commonly seen technology.

[0004] The Taiwan's Utility Model Patent No.95212225 "Light-effect Accessory Structure of the Showerhead" (US patent application No. 11/469,490, laid-open publication US 2008/0052820A1) discloses another case of generation of power source by making use of a micro-hydro-electric power generating device and utilizing the power source for water temperature sensing elements and a multiplicity of light-emitting elements that make use of the sensing element to sense various water temperatures to drive different colors of light-emitting elements to illuminate so as to achieve the

efficacy of calling the user's attention to watch the variation of the water temperature.

[0005] The PCT (Patent Cooperation Treaty) Patent No. PCT/ KR2003/002747 "Light-emitting Device of Water-flow Feedback Driving Power Source Water Temperature Sensing" discloses further a case of generation of power source by making use of a micro-hydro-electric power generating device and utilizing the power source on the structures of water temperature sensing water faucet, and showerhead, as well as light-emitting elements for warning the variation of water temperature.

[0006] EP 1 958 700 A2 describes a shower head with luminous and multicolored water jet, lighted by means of high-intensity LEDs in different colors that are switched on in sequence, powered by an internal generator that is set in motion by the water output pressure.

[0007] EP 1 531 204 A1 describes a shower head comprising at least one light-emitting element in the area of the water being expelled. To enable an evaluation of the water temperature a device is provided which realizes a color change of the emitted light dependent from the water temperature.

[0008] WO 2007/129174 A1 and DE 20 2007 015 029 U1 describe an integrated system for hydro-thermosanitary apparatuses comprising electric current generating means, a control board, water temperature sensors and LEDs or strips of LEDs arranged near the water outlet section for indicating the dispensed water temperature according to the color with which the light of the LEDs is emitted. An acoustic-vocal indicator may also be provided.

[0009] However, the above-mentioned structures of the prior art that make use of micro-hydro-electric power generating are all different. These structures of the prior art are unable to have mass production to become formal merchandise due to the immaturity in use or in structure or owing to the bulky structure or other reasons except the Taiwan's Utility Model Patent No.95212225 "Light-effect Accessory Structure of the Showerhead" (US patent application No. 11/469,490, laid-open publication US 2008/0052820A1).

### SUMMARY OF THE INVENTION

[0010] In light of the above-mentioned demerits of the showerhead structure of the prior art, the invention aims to ameliorate at least some of the disadvantages of the prior art or to provide a useful alternative.

[0011] The primary objective of the invention is to provide a showerhead structure having functions of temperature sensing and micro-hydro-electric power generating, by making use of the water-flow to drive the dynamic element, the showerhead structure of the invention is capable of generating electricity for making the light-emitting elements illuminate, and in association with the sensing element to drive the light-emitting elements for illuminating different colors of light after sensing the water temperature to achieve the objectives of having the func-

tions of temperature warning and intensifying the visual effect.

**[0012]** To achieve the above-mentioned objective, a showerhead structure having functions of temperature sensing and micro-hydro-electric power generating of the invention including a main body, a bearing seat, a power generating portion, an assembling seat cap, a circuit board, and a cover, has the following characteristics:

**[0013]** The main body has a containing space furnished at the top end thereof and a catch channel recessed at the periphery of the top end thereof where the containing space has a channel seat and a plurality of fastening portions furnished therein. A handle being positioned at the other end of the main body has a water outlet channel penetrated therein. The water outlet channel has a water outlet mouth furnished near the channel seat at one end of the handle, a filter placed at the opening of the other end of the handle, as well as a washer placed within the containing space;

**[0014]** The bearing seat which is a seat body appeared in circular shape, has a fastening seat, which appears rectangular frame, furnished at one side thereof. The fastening seat has a multiplicity of fastening portions furnished at the periphery thereof, and each of the fastening portions has a screw hole. The fastening seat has a first shaft channel furnished on each side thereof, and these first shaft channels are opposite each other in position. In addition, the fastening seat also has at least a second shaft channel furnished on each side thereof, which is adjacent to the first shaft channel, and these second shaft channels are also opposite each other in position. A gear and a pinion are connected by having a shaft penetrated through them and are mounted on the first shaft channel with the gear positioned out of the a side of the fastening seat while the pinion positioned in between the two sides of the fastening seat. A multiplicity of fastening elements are used to screw in the screw holes of the fastening portions;

**[0015]** The power generating portion further includes a pair of coil seats and an electromagnetic set where each of the coil seats having a coil surround thereof has a containing chamber while each side of the coil seat has a semi-circular shaft channel. The electromagnetic set includes a magnet, a securing socket with a shaft rod, a securing cap, and a gear. The magnet has the securing socket furnished at one end and the securing cap furnished at the other end. The electromagnetic set, after being assembled, is placed in the containing chamber of the pair of the connecting seats and has its shaft rod securing on the shaft channel, and also has the gear position on the outer side thereof;

**[0016]** The assembling seat cap has a multiplicity of lugs, each of which has a screw hole, furnished at the periphery thereof, and a pair of salient portions furnished on each side thereof respectively, and are in opposite position each other. The assembling seat cap has a slot provided at the center thereof. The slot has a pair of triangular shaft flanges furnished at the center section of

the side edges thereof and each of the shaft flanges has a penetrating shaft hole. A dynamic element having a teeth portion furnished at the periphery and blades furnished on each side thereof is mounted on the shaft flange through a rotating shaft penetrated through the shaft hole and the shaft hole at the center of the dynamic element. A sensing element is placed in a penetrating hole which is furnished on a slant surface of a protuberant block provided at the lower part of the assembling seat cap.

**[0017]** The circuit board has a multiplicity of light-emitting elements furnished thereon.

**[0018]** The cover has a multiplicity of transparent portions disposed in equal spaces and furnished on the inner side surface on the periphery thereof, and a multiplicity of catching portions at the side edge, as well as a washer for placing therein;

**[0019]** When it comes to assembling, the power generating portion is first placed in the fastening seat of the bearing seat making the shaft rod of the power generating portion mount on the second shaft channels. Afterwards, the fastening seat is covered by the assembling seat cap having the salient post thereof plug in the open end of the second shaft channels to secure the shaft rod mounting in the second shaft channels in position, then the whole thing is placed into the containing space of the main body with the protuberant block plugging in the channel seat making the fastening portions fasten to the corresponding lugs by tightening the fastening elements into the screw holes to secure with the fastening portions. Thereafter, the circuit board is placed in and is electrically connected to the power generating portion and the sensing element. Finally, the cover is covered and fastened by tightening the catching portions and the catch channel of the main body. By making use of the water-flow to drive the dynamic element, the showerhead structure of the invention is capable of generating electricity for making the light-emitting elements illuminate, and in association with the sensing element to drive the light-emitting elements for illuminating different colors of light after sensing the water temperature. In this way, the showerhead structure of the invention is capable of achieving the objectives of having the functions of temperature warning and intensifying the visual effect.

**[0020]** The accomplishment of this and other objectives of the invention will become apparent from the following description and its accompanying drawings of which:

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0021]**

FIG. 1 is a front outward appearance of the preferred embodiment of the showerhead structure of the invention;

FIG. 2 is an exploded view of the preferred embodi-

ment of the showerhead structure of the invention;

FIG. 3 is a cross-sectional side view of the showerhead structure of the invention;

FIG. 4 is a rear outward appearance of the showerhead structure of the invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] FIG. 1 is a front outward appearance of the preferred embodiment of the showerhead structure of the invention; FIG. 2 is an exploded view of the preferred embodiment of the showerhead structure of the invention; FIG. 3 is a cross-sectional side view of the showerhead structure of the invention. As shown in FIG. 1, FIG. 2, and FIG. 3, the showerhead structure of the invention includes a main body (1), a bearing seat (2), a power generating portion (3), an assembling seat cap (4), a circuit board (5), and a cover (6).

[0023] Among them, the main body (1) has a containing space (10) furnished at the top end thereof and a catch channel (11) recessed at the periphery of the top end thereof. The containing space (10) has a channel seat (12) and a plurality of fastening portions (13) furnished therein. A handle (14) being positioned at the other end of the main body (1) has a water outlet channel (141) penetrated therein. The water outlet channel (141) has a water outlet mouth (142) furnished near the channel seat (12) at one end of the handle (14), a filter (15) placed at the opening of the other end of the handle (14), as well as a washer (16) placed within the containing space (10).

[0024] The bearing seat (2), which is a seat body appeared in circular shape, has a fastening seat (21), which appears rectangular frame, furnished at one side thereof. The fastening seat (21) has a multiplicity of fastening portions (22) furnished at the periphery thereof, and each of the fastening portions (22) has a screw hole (221). The fastening seat (21) has a first shaft channel (211) furnished on each side thereof, and these first shaft channels (211) are opposite each other in position. Moreover, the fastening seat (21) also has at least a second shaft channel (212) furnished on each side thereof, which is adjacent to the first shaft channel (211), and these second shaft channels (212) are also opposite each other in position. A gear (24) and a pinion (25) are connected by having a shaft (23) penetrating through them and are mounted on the first shaft channel (211) with the gear (24) positioned out of the a side of the fastening seat (21) while the pinion (25) positioned in between the two sides of the fastening seat (21). What is more, a multiplicity of fastening elements (26) are used to screw in the screw holes (221) of the fastening portions (22).

[0025] The power generating portion (3) consists of a pair of coil seats (31) and an electromagnetic set (32). Each of the coil seats (31) having a coil (not shown in

the Figure) surround thereof has a containing chamber (310) while each side of the coil seat (31) has a semi-circular shaft channel (311). The electromagnetic set (32) includes a magnet (321), a securing socket (322) with a shaft rod (3221), a securing cap (323), and a gear (324). The magnet (321) has the securing socket (322) furnished at one end and the securing cap (323) furnished at the other end. The electromagnetic set (32), after being assembled, is placed in the containing chamber (310) of the pair of the connecting seats (21) and has its shaft rod (3221) securing on the shaft channel (311), and also has the gear (324) position on the outer side thereof.

[0026] The assembling seat cap (4) has a multiplicity of lugs (41), each of which has a screw hole (411), furnished at the periphery thereof, and a pair of salient portions (42) furnished on each side thereof respectively and in opposite position each other. Moreover, the assembling seat cap, (4) has a slot (40) provided at the center thereof. The slot (40) has a pair of triangular shaft flanges (43) furnished at the center section of the side edges thereof. Each of the shaft flanges (43) has a penetrating shaft hole (431). A dynamic element (45) having a teeth portion (451) furnished at the periphery and blades (452) furnished on each side thereof is mounted on the shaft flange (43) through a rotating shaft (44) penetrating through the shaft hole (431) and the shaft hole at the center of the dynamic element (45). A sensing element (47) is placed in a penetrating hole (461) which is furnished on an slant surface of a protuberant block (46) provided at the lower part of the assembling seat cap (4).

[0027] The circuit board (5) has a multiplicity of light-emitting elements (51) furnished thereon, and the light-emitting elements (51) are light-emitting diodes (LEDs).

[0028] The cover (6) has a multiplicity of transparent portions (61) disposed in equal spaces and furnished on the inner side surface on the periphery thereof, and has a multiplicity of catching portions (62) at the side edge, as well as a washer (63) for placing therein.

[0029] When it comes to assembling, the power generating portion (3) is first placed in the fastening seat (21) of the bearing seat (2) making the shaft rod (3221) of the power generating portion (3) mount on the second shaft channels (212). Afterwards, the fastening seat (21) is covered by the assembling seat cap (4) having the salient post (42) thereof plug in the open end of the second shaft channels (212) to secure the shaft rod (3221) mounting in the second shaft channels (212) in position, then place the whole thing into the containing space (10) of the main body (1) with the protuberant block (46) plugging in the channel seat (12) making the fastening portions (13) fasten to the corresponding lugs (41) by tightening the fastening elements (26) into the screw holes (221), (411) to secure with the fastening portions (13). Thereafter, the circuit board (5) is placed in and is electrically connected to the power generating portion (3) and the sensing element (47). Finally, the cover (6) is covered and fastened by tightening the catching portions (62) and the catch channel (11) of the main body (1).

**[0030]** FIG. 3 is a cross-sectional side view of the showerhead structure of the invention while FIG. 4 is a rear outward appearance of the showerhead structure of the invention. As shown in FIG. 3, and FIG. 4, when the showerhead structure having functions of temperature sensing and micro-hydro-electric power generating of the invention is in service, water-flow passes the water outlet channel (141) through the filter (15) of the main body (1) and flows in the containing space (10) via the water outlet mouth (142). The sensing element (47) senses the water temperature to gain the signal that is transmitted to the circuit board (5). Moreover, the water flows through the blades (452) to make the dynamic element (45) rotate, and sequentially causes a series of gear train starting from the teeth portion (451), the pinion (25) on the bearing seat (2), to the gear (24), (324) resulting in the rotation of the electromagnetic set (32). Consequently, the magnet (321) in the electromagnetic set (32) and the coil surrounding the coil seat (31) generate electric power to provide the circuit board (5) with electricity which in sequence causing the light-emitting elements (51) to illuminate which is capable of being observed through the transparent portions (61) of the cover (6). Therefore, by making use of the water-flow to drive the dynamic element (45), the showerhead structure of the invention is capable of generating electricity for making the light-emitting elements (51) illuminate, and in association with the sensing element (47) to drive the light-emitting elements (51) for illuminating different colors of light after sensing the water temperature. If the water flowing in having the temperature less than 35°C, the light-emitting elements (51) will generate blue color, if the water flowing in having the temperature in the range of 35°C~ 45°C, the light-emitting elements (51) will generate yellow color, and if the water flowing in having the temperature greater than 45°C, the light-emitting elements (51) will generate red color. In this way, the showerhead structure of the invention is capable of achieving the objectives of having the functions of temperature warning and intensifying the visual effect.

**[0031]** It will become apparent to those people skilled in the art that various modifications and variations can be made to the structure of the invention without departing from the scope or spirit of the invention. In view of the foregoing description, it is intended that all the modifications and variation fall within the scope of the following appended claims and their equivalents.

## Claims

1. A showerhead structure having functions of temperature sensing and micro-hydro-electric power generating comprising:

(a) a main body (1) having a containing space (10) furnished at the top end thereof and a catch channel (11) recessed at the periphery of the

top end thereof where the containing space (10) has a channel seat (12) and a plurality of fastening portions (13) furnished therein; a handle (14) being positioned at the other end of the main body (1) has a water outlet channel (141) penetrated therein; the water outlet channel (141) has a water outlet mouth (142) furnished near the channel seat (12) at one end of the handle (14), a filter (15) placed at the opening of the other end of the handle (14), as well as a washer (16) placed within the containing space (10);

(b) a bearing seat (2) which is a seat body appeared in circular shape, has a fastening seat (21), which appears rectangular frame, furnished at one side thereof; the fastening seat (21) has a multiplicity of fastening portions (22) furnished at the periphery thereof, and each of the fastening portions (22) has a screw hole (221); the fastening seat (21) has a first shaft channel (211) furnished on each side thereof, and these first shaft channels (211) are opposite each other in position; the fastening seat (21) also has at least a second shaft channel (212) furnished on each side thereof, which is adjacent to the first shaft channel (211), and these second shaft channels (212) are also opposite each other in position; a gear (24) and a pinion (25) are connected by having a shaft (23) penetrating through them and are mounted on the first shaft channel (211) with the gear (24) positioned out of a side of the fastening seat (21) while the pinion (25) positioned in between the two sides of the fastening seat (21); a multiplicity of fastening elements (26) are used to screw in the screw holes (221) of the fastening portions (22);

(c) a power generating portion (3) further comprising a pair of coil seats (31) and an electromagnetic set (32); each of the coil seats (31) having a coil surround thereof has a containing chamber (310) while each side of the coil seat (31) has a semi-circular shaft channel (311); the electromagnetic set (32) including a magnet (321), a securing socket (322) with a shaft rod (3221), a securing cap (323), and a gear (324); the magnet (321) having the securing socket (322) furnished at one end and the securing cap (323) furnished at the other end; the electromagnetic set (32), after being assembled, being placed in the containing chamber (310) of the pair of the connecting seats and having its shaft rod (3221) securing on the shaft channel (311), and also having the gear position on the outer side thereof;

(d) an assembling seat cap (4) having a multiplicity of lugs (41), each of which has a screw hole (411), furnished at the periphery thereof, and a pair of salient portions (42) furnished on each side thereof respectively and being in op-

posite position each other; the assembling seat cap (4), having a slot (40) provided at the center thereof; the slot (40) having a pair of triangular shaft flanges (43) furnished at the center section of the side edges thereof; each of the shaft flanges (43) having a penetrating shaft hole (431); a dynamic element (45) having a teeth portion (451) furnished at the periphery and blades (452) furnished on each side thereof is mounted on the shaft flange (43) through a rotating shaft (44) penetrating through the shaft hole (431) and the shaft hole at the center of the dynamic element (45); a sensing element (47) is placed in a penetrating hole (461) which is furnished on an slant surface of a protuberant block (46) provided at the lower part of the assembling seat cap (4);

(e) a circuit board (5) having a multiplicity of light-emitting elements (51) furnished thereon; and (f) a cover (6) having a multiplicity of transparent portions (61) disposed in equal spaces and furnished on the inner side surface on the periphery thereof, and a multiplicity of catching portions (62) at the side edge, as well as a washer (63) for placing therein;

wherein, when it comes to assembling, the power generating portion (3) is first placed in the fastening seat (21) of the bearing seat (2) making the shaft rod (3221) of the power generating portion (3) mount on the second shaft channels (212), afterwards, the fastening seat (21) is covered by the assembling seat cap (4) having the salient portion thereof plug in the open end of the second shaft channels (212) to secure the shaft rod (3221) mounting in the second shaft channels (212) in position, then place the whole thing into the containing space (10) of the main body (1) with the protuberant block (46) plugging in the channel seat (12) making the fastening portions (22) fasten to the corresponding lugs (41) by tightening the fastening elements (26) into the screw holes (221), to secure with the fastening portions (22); thereafter, the circuit board (5) is placed in and is electrically connected to the power generating portion (3) and the sensing element (47); finally, the cover (6) is covered and fastened by tightening the catching portions (62) and the catch channel (11) of the main body (1).

2. The showerhead structure having functions of temperature sensing and micro-hydro-electric power generating as claimed in claim 1, wherein the light-emitting elements- (51) are light-emitting diodes (LEDs).
3. The showerhead structure having functions of temperature sensing and micro-hydro-electric power generating as claimed in claim 1, wherein if the water

flowing in having the temperature less than 35°C, the light-emitting elements (51) will generate blue color.

4. The showerhead structure having functions of temperature sensing and micro-hydro-electric power generating as claimed in claim 1, wherein if the water flowing in having the temperature in the range of 35°C~ 45°C, the light-emitting elements (51) will generate yellow color.
5. The showerhead structure having functions of temperature sensing and micro-hydro-electric power generating as claimed in claim 1, wherein if the water flowing in having the temperature greater than 45°C, the light-emitting elements (51) will generate red color.

#### Patentansprüche

1. Eine Duschkopfstruktur mit Funktionen der Temperaturmessung und Erzeugung von mikro-hydroelektrischem Strom, umfassend:

(a) einen Hauptkörper (1), welcher einen Aufnahmeraum (10), der an dem oberen Ende davon angeordnet ist, und eine Auffangrinne (11), welche als Aussparung an dem Umfang des oberen Endes davon ausgebildet ist, aufweist, wobei der Aufnahmeraum (10) einen Kanalsitz (12) und eine Vielzahl von darin angeordneten Befestigungsabschnitten (13) aufweist; ein Griff (14), welcher an dem anderen Ende des Hauptkörpers (1) angeordnet ist, weist einen diesen durchdringenden Wasserauslasskanal (141) auf; der Wasserauslasskanal (141) weist eine Wasserauslassöffnung (142), welche in der Nähe des Kanalsitzes (12) an einem Ende des Griffes (14) ausgebildet ist, einen Filter (15), welcher an der Öffnung an dem anderen Ende des Griffes (14) ausgebildet ist, und einen Dichtring (16), welcher innerhalb des Aufnahmeraumes (10) angeordnet ist, auf;

(b) einen Lagersitz (2), welcher als ein kreisrunder Sitz ausgebildet ist, welcher einen an einer Seite angeordneten Befestigungssitz (21), der als ein rechteckförmiger Rahmen ausgebildet ist, aufweist; der Befestigungssitz (21) weist eine Vielzahl von um den Umfang davon angeordneten Befestigungsabschnitten (22) auf, wobei jeder der Befestigungsabschnitte (22) ein Schraubenloch (221) aufweist; der Befestigungssitz (21) weist an jeder Seite einen ersten Wellenkanal (211) auf, wobei diese ersten Wellenkanäle (211) sich gegenüberliegend angeordnet sind; der Befestigungssitz (21) weist ferner mindestens einen zweiten an jeder Seite angeordneten Wellenkanal (212) auf, welcher be-

nachbart zu dem ersten Wellenkanal (211) angeordnet ist, wobei die zweiten Wellenkanäle (212) ebenfalls sich gegenüberliegend angeordnet sind; ein Zahnrad (24) und ein Ritzel (25) sind über eine durch diese hindurchgeführte Welle (23) miteinander verbunden und sind an dem ersten Wellenkanal (211) befestigt, wobei das Zahnrad (24) außerhalb des Befestigungssitzes (21) angeordnet ist und das Ritzel (25) zwischen den beiden Seiten des Befestigungssitzes (21) angeordnet ist; eine Vielzahl von Befestigungselementen (26) werden dazu verwendet in die Schraubenlöcher (221) der Befestigungsabschnitte (22) eingeschraubt zu werden; (c) einen Energieerzeugungsabschnitt (3), welcher ferner ein Paar von Spulensitzen (31) und eine elektromagnetische Anordnung (32) umfasst; jeder der Spulensitze (31), welcher eine umlaufende Spule aufweist, weist eine Aufnahmekammer (310) auf, wobei jede Seite des Spulensitzes (31) einen halbkreisförmigen Wellenkanal (311) aufweist; die elektromagnetische Anordnung (32) umfasst einen Magneten (321), eine Sicherungsbuchse (322) mit einem Wellenstab (3221), einen Sicherungsdeckel (323), und ein Zahnrad (324); der Magnet (321) hat die Sicherungsbuchse (322) an einem Ende und den Sicherungsdeckel (323) an dem anderen Ende angeordnet; die elektromagnetische Anordnung (32) wird, nachdem diese zusammengesetzt ist, in der Aufnahmekammer (310) der Paar von Befestigungssitzen angeordnet, wobei ihr Wellenstab (3221) an dem Wellenkanal (311) gesichert wird und das Zahnrad außerhalb angeordnet wird; (d) einen Montagesitzdeckel (4), welcher eine Vielzahl an seinem Umfang angeordnete Anschlussstücke (41), wobei jedes davon ein Schraubenloch (411) aufweist, und welcher ein Paar von jeweils an jeder Seite gegenüberliegend angeordnete Vorsprungsabschnitte (42) aufweist; der Montagesitzdeckel (4) weist einen mittig angeordneten Schlitz (40) auf; der Schlitz (40) weist ein Paar von dreieckig ausgebildeten Wellenflanschen (43) auf, die in dem mittleren Abschnitt der Seitenränder angeordnet sind; jeder der Wellenflansche (43) weist ein Durchgangswellenloch (431) auf; ein dynamisches Element (45), welches einen an dem Umfang angeordneten gezahnten Abschnitt (451) und an beiden Seiten davon angeordnete Schaufeln (452) aufweist, ist an dem Wellenflansch (43) mittels einer Rotationswelle (44), welche durch das Wellenloch (431) und das Wellenloch in der Mitte des dynamischen Elements (45) hindurchgeführt ist, befestigt; ein Messfühler (47) ist in einem Durchgangsloch (461), welches an einer geeigneten Fläche eines hervorstehenden Block-

kes (46), welcher an einem unteren Teil des Montagesitzdeckels (4) vorgesehen ist, ausgebildet ist, positioniert;

(e) eine Platine (5), welche eine Vielzahl daran angeordneter Leuchtelemente (51) aufweist; und

(f) eine Abdeckung (6), welche eine Vielzahl von in gleichen Abständen zueinander, an der Innenseitenfläche des Umfangs angeordnete transparente Abschnitte (61), und eine Vielzahl von Einrastabschnitten (62) an dem Seitenrand sowie einen darin anordbaren Dichtungsring (63) aufweist;

wobei, bei einer Montage, zuerst der Energieerzeugungsabschnitt (3) in dem Befestigungssitz (21) des Lagersitzes (2) angeordnet wird, indem der Wellenstab (3221) des Energieerzeugungsabschnittes (3) an den zweiten Wellenkanälen (212) befestigt wird, anschließend der Befestigungssitz (21) durch den Montagesitzdeckel (4) abgedeckt wird, wobei der Vorsprungsabschnitt davon in das offene Ende der zweiten Wellenkanäle (212) eingesteckt wird, um den in den zweiten Wellenkanälen (212) befestigten Wellenstab (3221) in seiner Position zu sichern, dieses alles dann in dem Aufnahmeraum (10) des Hauptkörpers (1) angeordnet wird, wobei zum Sichern mit den Befestigungsabschnitten (22) der in dem Kanalsitz (12) eingesteckte hervorstehende Block (46) die Befestigungsabschnitte (22) an den entsprechenden Anschlussstücken (41) durch Festziehen der Befestigungselemente (26) in den Schraubenlöchern (221) befestigt; danach die Platine (5) angeordnet wird und mit dem Energieerzeugungsabschnitt (3) und dem Messfühler (47) elektrisch verbunden wird; abschließend die Abdeckung (6) angeordnet wird und durch Spannen der Einrastabschnitte (62) in der Auffangrinne (11) des Hauptkörpers (1) befestigt wird.

2. Die Duschkopfstruktur mit Funktionen der Temperaturmessung und Erzeugung von mikro-hydroelektrischem Strom nach Anspruch 1, wobei die Leuchtelemente (51) Leuchtdioden (LEDs) sind.
3. Die Duschkopfstruktur mit Funktionen der Temperaturmessung und Erzeugung von mikro-hydroelektrischem Strom nach Anspruch 1, wobei, wenn das einfließende Wasser eine Temperatur weniger als 35 °C aufweist, die Leuchtelemente (51) eine blaue Farbe erzeugen.
4. Die Duschkopfstruktur mit Funktionen der Temperaturmessung und Erzeugung von mikro-hydroelektrischem Strom nach Anspruch 1, wobei, wenn das einfließende Wasser eine Temperatur im Bereich zwischen 35 °C ~ 45 °C aufweist, die Leuchtelemente (51) eine gelbe Farbe erzeugen.

5. Die Duschkopfstruktur mit Funktionen der Temperaturmessung und Erzeugung von mikro-hydroelektrischem Strom nach Anspruch 1, wobei, wenn das einfließende Wasser eine Temperatur von mehr als 45 °C aufweist, die Leuchtelemente (51) eine rote Farbe erzeugen.

## Revendications

1. Structure de pommeau de douche ayant des fonctions de détection de température et de génération d'énergie micro-hydroélectrique comprenant :
  - (a) un corps principal (1) ayant un espace de confinement (10) prévu au niveau de son extrémité supérieure et un canal de capture (11) évité au niveau de la périphérie de son extrémité supérieure où l'espace de confinement (10) a un siège de canal (12) et une pluralité de parties de fixation (13) prévues à l'intérieur de ce dernier ; une poignée (14) étant positionnée au niveau de l'autre extrémité du corps principal (1) a un canal de sortie d'eau (141) qui pénètre à l'intérieur de ce dernier ; le canal de sortie d'eau (141) a une entrée de sortie d'eau (142) prévue à proximité du siège de canal (12) au niveau d'une extrémité de la poignée (14), un filtre (15) placé au niveau de l'ouverture de l'autre extrémité de la poignée (14), ainsi qu'une rondelle (16) placée à l'intérieur de l'espace de confinement (10) ;
  - (b) un siège de palier (2) qui est un corps de siège se présentant sous une forme circulaire, a un siège de fixation (21), qui apparaît sous la forme d'un châssis rectangulaire, prévu au niveau de l'un de ses côtés ; le siège de fixation (21) a une pluralité de parties de fixation (22) prévues au niveau de sa périphérie, et chacune des parties de fixation (22) a un trou de vis (221) ; le siège de fixation (21) a un premier canal de tige (211) prévu au niveau de chacun de ses côtés, et ces premiers canaux de tige (211) sont opposés entre eux du point de vue de la position ; le siège de fixation (21) a également au moins un deuxième canal de tige (212) prévu sur chacun de ses côtés, qui est adjacent au premier canal de tige (211), et ces deuxièmes canaux de tige (212) sont également opposés entre eux du point de vue de la position ; un engrenage (24) et un pignon (25) sont raccordés en ayant une tige (23) qui pénètre à travers ces derniers, et sont montés sur le premier canal de tige (211) avec l'engrenage (24) positionné hors d'un côté du siège de fixation (21) alors que le pignon (25) est positionné entre les deux côtés du siège de fixation (21) ; on utilise une pluralité d'éléments de fixation (26) pour le vissage dans

les trous de vis (221) des parties de fixation (22) ;

(c) une partie de génération d'énergie (3) comprenant en outre une paire de sièges de bobine (31) et un ensemble électromagnétique (32) ; chacun des sièges de bobine (31) ayant son environnement de bobine qui a une chambre de confinement (310) alors que chaque côté du siège de bobine (31) a un canal de tige semi-circulaire (311) ; l'ensemble électromagnétique (32) comprenant un aimant (321), une douille de fixation (322) avec une barre de tige (3221), un capuchon de fixation (323), et un engrenage (324) ; l'aimant (321) ayant la douille de fixation (322) prévue au niveau d'une extrémité et le capuchon de fixation (323) prévu au niveau de l'autre extrémité ; l'ensemble électromagnétique (32), après avoir été assemblé, est placé dans la chambre de confinement (310) de la paire de sièges de raccordement et a sa barre de tige (3221) fixée sur le canal de tige (311), et a également l'engrenage positionné sur son côté externe ;

(d) un capuchon de siège d'assemblage (4) ayant une pluralité de pattes (41), dont chacune a un trou de vis (411), prévu au niveau de sa périphérie, et une paire de parties saillantes (42) prévues sur chacun de ses côtés respectivement, et étant positionnées de manière opposée entre elles ; le capuchon de siège d'assemblage (4) ayant une fente (40) prévue au niveau de son centre ; la fente (40) ayant une paire de rebords de tige triangulaire (43) prévus au niveau de la section centrale de ses bords latéraux ; chacun des rebords de tige (43) ayant un trou de tige de pénétration (431) un élément dynamique (45) ayant une partie de dents (451) prévue au niveau de la périphérie et des lames (452) prévues sur chacun de ses côtés est monté sur le rebord de tige (43) par le biais d'une tige rotative (44) pénétrant à travers le trou de tige (431) et le trou de tige au centre de l'élément dynamique (45) ; un élément de détection (47) est placé dans un trou de pénétration (461) qui est prévu sur une surface inclinée d'un bloc en saillie (46) prévu au niveau de la partie inférieure du capuchon de siège d'assemblage (4) ;

(e) une carte de circuit imprimé (5) ayant une pluralité d'éléments d'émission de lumière (51) prévus sur cette dernière ; et

(f) un couvercle (6) ayant une pluralité de parties transparentes (61) disposées dans des espaces identiques et prévues sur la surface latérale interne sur sa périphérie, et une pluralité de parties de capture (62) au niveau du côté latéral, ainsi qu'une rondelle (63) destinée à être placée à l'intérieur de ce dernier ;

dans laquelle, lors de l'assemblage, la partie de gé-



nération d'énergie (3) est tout d'abord placée dans le siège de fixation (21) du siège de palier (2) permettant de monter la barre de tige (3221) de la partie de génération d'énergie (3) sur les deuxièmes canaux de tige (212), ensuite, le siège de fixation (21) est recouvert par le capuchon de siège d'assemblage (4) ayant sa partie saillant raccordé dans l'extrémité ouverte des deuxièmes canaux de tige (212) pour fixer la barre de tige (3221) qui est montée dans les deuxièmes canaux de tige (212) en position, placer ensuite la totalité de la structure dans l'espace de confinement (10) du corps principal (1) avec le bloc en saillie (46) qui se raccorde dans le siège de canal (12) permettant aux parties de fixation (22) de se fixer aux pattes (41) correspondantes en serrant les éléments de fixation (26) dans les trous de vis (221), afin de se fixer avec les parties de fixation (22) ; ensuite la carte de circuit imprimé (5) est placée à l'intérieur et est électriquement raccordée à la partie de génération d'énergie (3) et à l'élément de détection (47) ; finalement, le couvercle (6) est appliqué et fixé en serrant les parties de capture (62) et le canal de capture (11) du corps principal (1).

2. Structure de pommeau de douche ayant des fonctions de détection de température et de génération d'énergie micro-hydroélectrique selon la revendication 1, dans laquelle les éléments d'émission de lumière (51) sont des diodes électroluminescentes (LED).
3. Structure de pommeau de douche ayant des fonctions de détection de température et de génération de puissance micro-hydroélectrique selon la revendication 1, dans laquelle si l'eau qui s'écoule a une température inférieure à 35°C, les éléments d'émission de lumière (51) produisent une couleur bleue.
4. Structure de pommeau de douche ayant des fonctions de détection de température et de génération d'énergie micro-hydroélectrique selon la revendication 1, dans laquelle si l'eau qui s'écoule a une température de l'ordre de 35°C - 45°C, les éléments d'émission de lumière (51) produisent une couleur jaune.
5. Structure de pommeau de douche ayant des fonctions de détection de température et de génération d'énergie micro-hydroélectrique selon la revendication 1, dans laquelle si l'eau qui s'écoule a une température supérieure à 45°C, les éléments d'émission de lumière (51) produisent une couleur rouge.

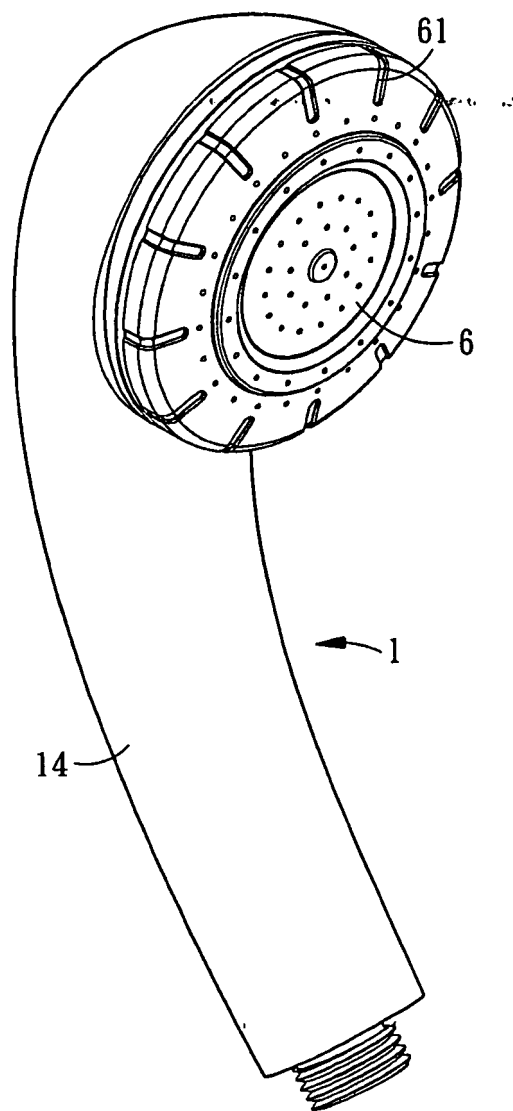


Fig. 1

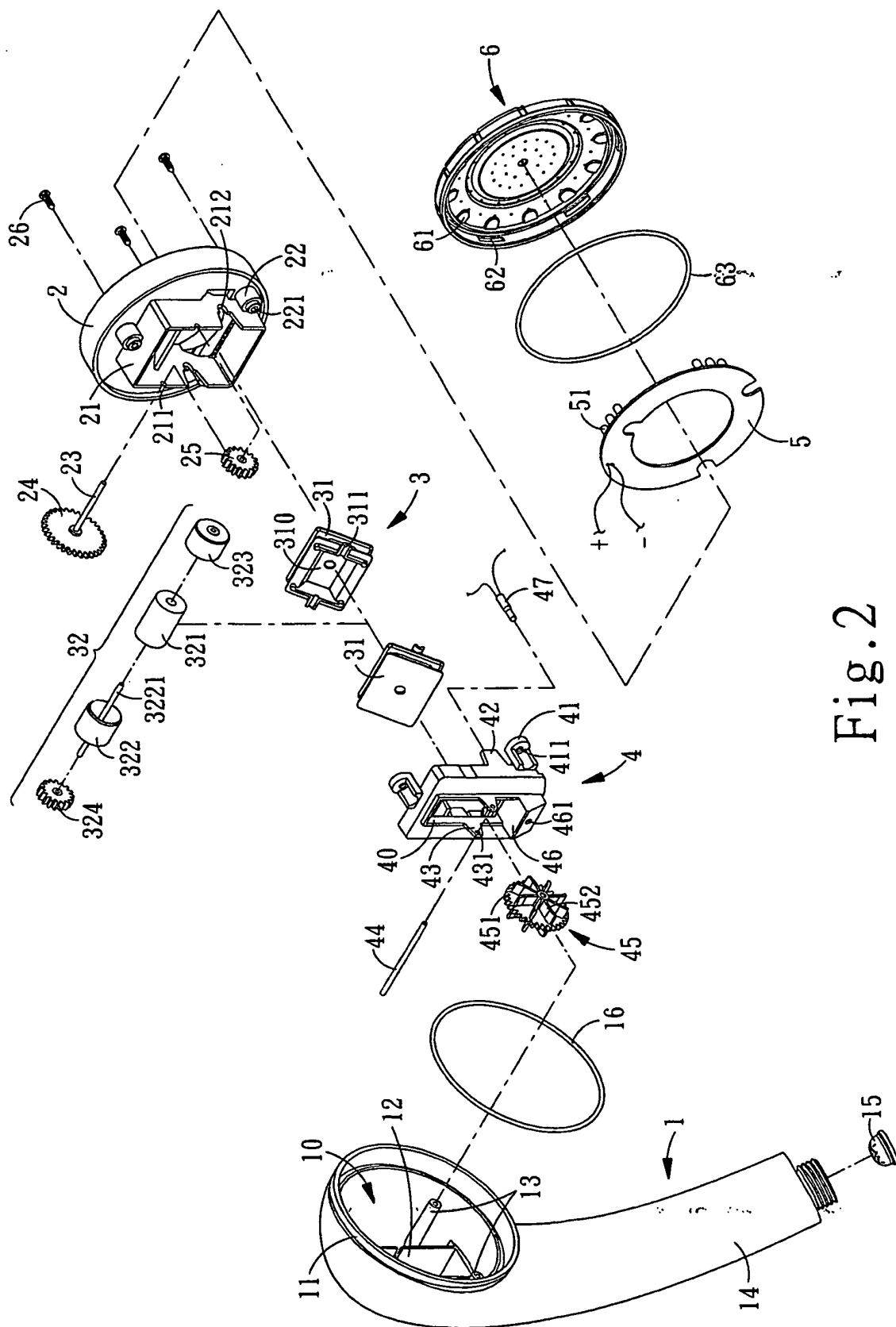


Fig. 2

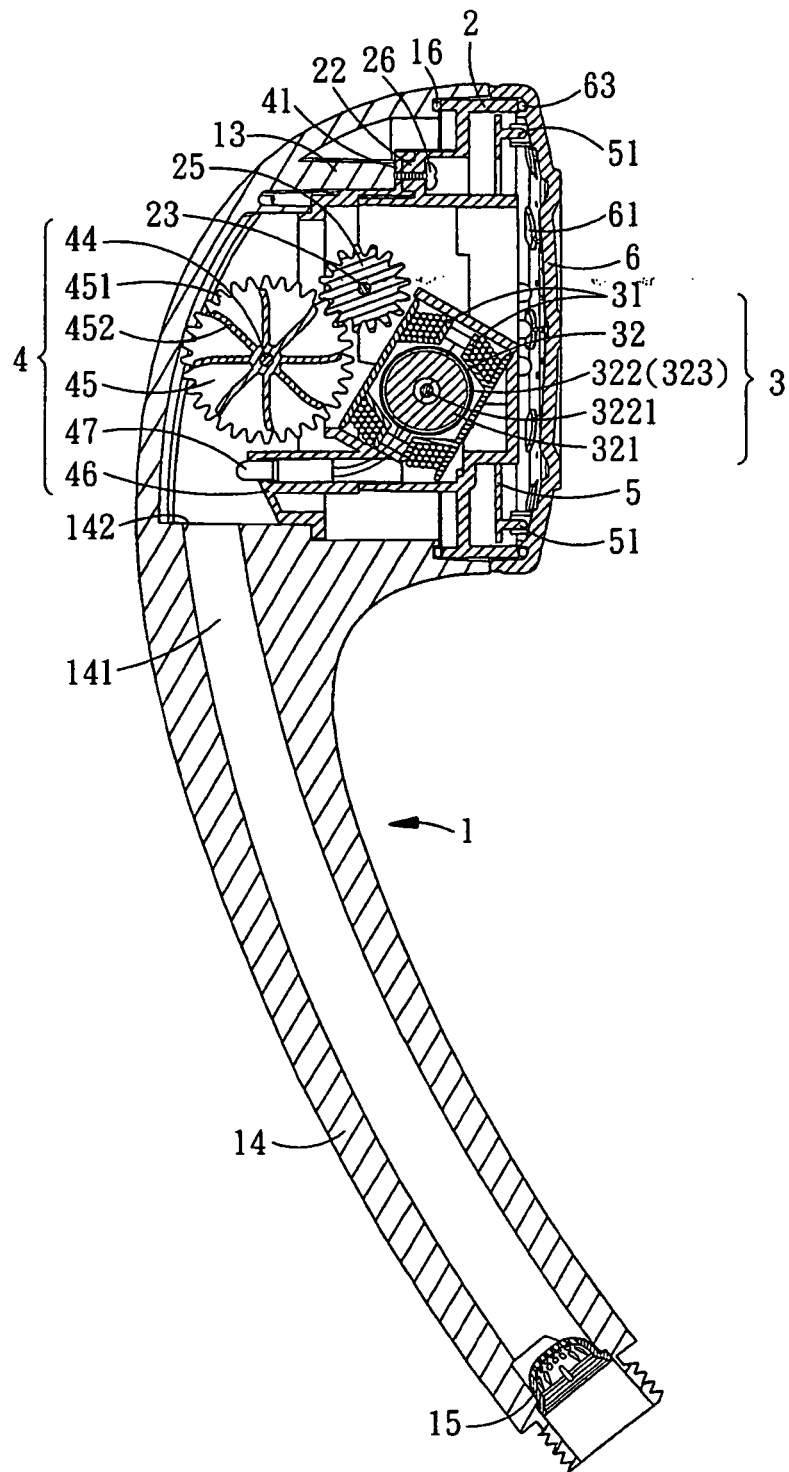


Fig.3

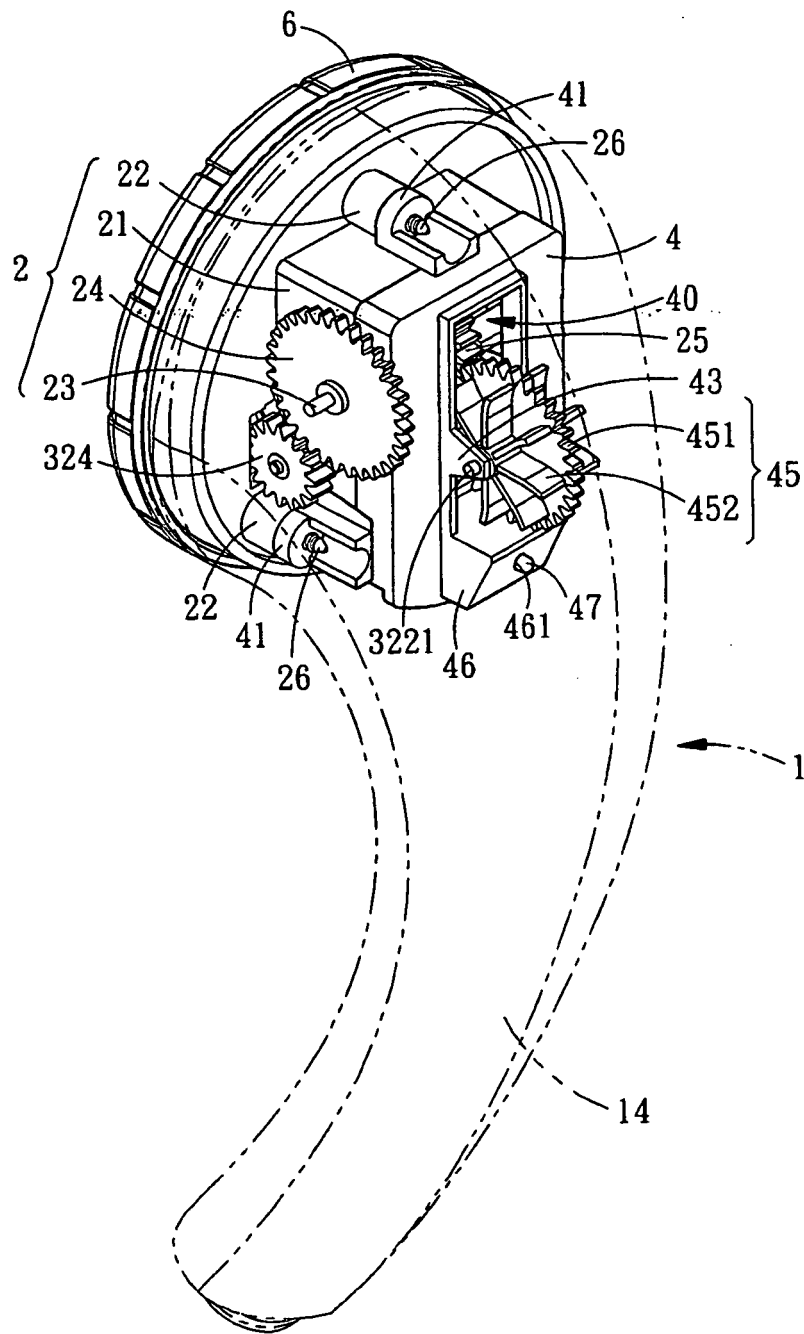


Fig.4

**REFERENCES CITED IN THE DESCRIPTION**

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