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(54) **LIGHT SOURCE MODULE**

LEUCHTMITTEL

MODULE FORMANT SOURCE DE LUMIÈRE

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(56) References cited:

EP-A1- 2 660 897

WO-A1-2013/112838

US-A1- 2007 236 920

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Description

BACKGROUND OF THE INVENTION

1. Field of the invention

[0001] The present invention relates to a light source module. More particularly, the assembly of a light source module is easier and more convenient, the bad connection or short circuit is not occurred, and the inner resistance and the power consumption are decreased, moreover, the material and the performance choice are more flexible and convenient, further decreasing the manufacture cost and increasing the utility.

2. Description of Related Art

[0002] The flashlight is a common illuminating tool in the people daily life for lighting a place which is narrow and poor visibility or dark. It is convenient for people looking for the items, walking, exercising, or doing anything. Accordingly, the flashlight is one of the necessary items in the people daily life.

[0003] The present common structure of all kinds of the flashlight comprises a shell and a lampshade base. A light source module is set in front of the shell and is covered by the lampshade base, and then the lampshade base and the shell is secured by the screws. A battery is put in the shell for providing the light source module the electric energy to illuminate. The positive electrode of the battery is conducted with the positive electrode of the light source module, and a switch is set in the lateral side of the shell, making the switch conducting with the negative electrode of the battery. When the switch is pushed, the switch is contacted to the reflector lamp cup of the lampshade base, which lampshade base is conducted to the negative electrode of the light source module, making the electric energy be a loop. Therefore, the illuminating function of the light source module is opened or closed via the control of the switch.

[0004] However, the foregoing flashlight can achieve the illuminating function by providing the necessary electric energy to the light source module, but the following disadvantages are discovered in actual use.

[0005] In the foregoing flashlight structure, the reflector lamp cup of the lampshade base is conducted to the negative electrode of the light source module to do power transmission, so it is appeared that the assembly is very inconvenient, and the bad connection or short circuit is occurred more easily, resulting that the light source module cannot illuminate; furthermore, it is consumed more electric energy due to the larger inner resistance of the reflector lamp cup.

[0006] In the foregoing flashlight structure, the reflector lamp cup of the lampshade base is conducted to the negative electrode of the light source module to do power transmission, so the reflector lamp cup needs to be made of metal material, not only making limit for the material

choice and the performance of the reflector lamp cup, but also the manufacture cost is increased.

[0007] Document US 2007/0236920 discloses a light source module according to the preamble of claim 1 of the invention.

SUMMARY OF THE INVENTION

[0008] Accordingly, the object of the present invention is to provide a light source module, of which the assembly is easier and more convenient, the bad connection or short circuit is not occurred, and the inner resistance and the power consumption are decreased, moreover, the material and the performance choice of the reflector lamp cup is more flexible and convenient, further decreasing the manufacture cost and increasing the utility.

[0009] For the above object, a light source module comprises a fixing plate, a substrate, a heat dissipation plate, a fixing base for elastic element, a positive electrode elastic element, and a negative electrode elastic element.

[0010] The fixing plate is formed with an aperture in the center.

[0011] The substrate is set at an inner side of the fixing plate, connected with an illuminate element at where corresponding to the aperture of the fixing plate, and formed with a positive electrode connecting portion and a negative electrode connecting portion to respectively electrically connect to a positive electrode and a negative electrode of the illuminate element.

[0012] The heat dissipation plate is closely set at an inner side of the substrate and formed with a positive electrode through hole and a negative electrode through hole respectively at where corresponding to the positive electrode connecting portion and the negative electrode connecting portion.

[0013] The fixing base for elastic element is set at an inner side of the heat dissipation plate, having an assembling portion and formed with a positive electrode perforation and a negative electrode perforation respectively at where corresponding to the positive and the negative electrode through holes of the heat dissipation plate.

[0014] The positive electrode elastic element is sleeved inside the assembling portion of the fixing base and formed with a positive electrode pin which connected with the positive electrode connecting portion of the substrate by passing through the positive electrode perforation of the fixing base and the positive electrode through hole of the heat dissipation plate.

[0015] The negative electrode elastic element is sleeved an outer edge of the assembling portion of the fixing base and formed with a negative electrode pin which connected with the negative electrode connecting portion of the substrate by passing through the negative electrode perforation of the fixing base and the negative electrode through hole of the heat dissipation plate.

[0016] According to an embodiment of the present invention, the fixing plate is formed of a plastic material.

[0017] According to an embodiment of the present invention, the fixing plate comprises a screw hole at an outer edge thereof, and the fixing base for elastic element comprises a screwing hole at where corresponding to the screw hole of the fixing plate, for fixing a screw in the screw hole and the screwing hole.

[0018] According to an embodiment of the present invention, the heat dissipation plate is formed of aluminum.

[0019] According to an embodiment of the present invention, the fixing base for elastic element is formed of a plastic material.

[0020] According to an embodiment of the present invention, the positive electrode pin of the positive electrode elastic element is welded on the positive electrode connecting portion of the substrate.

[0021] According to an embodiment of the present invention, the negative electrode pin of the negative electrode elastic element is welded on the negative electrode connecting portion of the substrate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Fig. 1 is a three-dimensional exploded view of a light source module according to an embodiment of the present invention;

Fig. 2 is a three-dimensional perspective of a light source module according to an embodiment of the present invention;

Fig. 3 is a side sectional view of a light source module according to an embodiment of the present invention; and

Fig. 4 is a side sectional view of a light source module in use according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Please refer to Fig. 1, which is a three-dimensional exploded view of a light source module according to an embodiment of the present invention. A light source module comprises a fixing plate 1, a substrate 2, a heat dissipation plate 3, a fixing base 4 for elastic element, a positive electrode elastic element 5, and a negative electrode elastic element 6.

[0024] The fixing plate 1 is formed of a plastic material and formed with an aperture 11 in the center. A screw hole 12 is in an outer edge of the fixing plate 1 for a screw 121 being screwed.

[0025] The substrate 2 is set at an inner side of the fixing plate 1, connected with an illuminate element 21 at where corresponding to the aperture 11 of the fixing plate 1, and formed with a positive electrode connecting portion 22 and a negative electrode connecting portion 23 to respectively electrically connect to a positive electrode and a negative electrode of the illuminate element

21.

[0026] The heat dissipation plate 3 is formed of aluminum, closely connected to an inner side of the substrate 2, and formed with a positive electrode through hole 31 and a negative electrode through hole 32 respectively at where corresponding to the positive electrode connecting portion 22 and the negative electrode connecting portion 23 of the substrate 2.

[0027] The fixing base 4 for elastic element is formed of plastic material at an inner side of the heat dissipation plate 3, having an assembling portion 41, and formed with a positive electrode perforation 42 and a negative electrode perforation 43 respectively at where corresponding to the positive electrode through hole 31 and the negative electrode through hole 32 of the heat dissipation plate 3. Furthermore, the fixing base 4 for elastic element comprises a screwing hole 44 at where corresponding to the screw hole 12 of the fixing plate 1 for a screw 121 being screwed.

[0028] The positive electrode elastic element 5 is sleeved inside the assembling portion 41 of the fixing base 4 and formed with a positive electrode pin 51 which is passed through the positive electrode perforation 42 of the fixing base 4 and the positive electrode through hole 31 of the heat dissipation plate 3 to weld on the positive electrode connecting portion 22 of the substrate 2.

[0029] The negative electrode elastic element 6 is sleeved an outer edge of the assembling portion 41 of the fixing base 4 and formed with a negative electrode pin 61 which is passed through the negative electrode perforation 43 of the fixing base 4 and the negative electrode through hole 32 of the heat dissipation plate 3 to weld on the negative electrode connecting portion 23 of the substrate 2.

[0030] Please refer to Fig. 2 and Fig. 3, which are a three-dimensional perspective and a side sectional view of a light source module according to an embodiment of the present invention. When the light source module of the present invention is assembled, the heat dissipation plate 3 is contacted and connected to the inner side of the substrate 2, and the fixing base 4 for elastic element is set at the inner side of the heat dissipation plate 3. The positive electrode elastic element 5 is sleeved inside the assembling portion 41 of the fixing base 4, and the positive electrode pin 51 of the positive electrode elastic element 5 is passed through the positive electrode perforation 42 of the fixing base 4 and the positive electrode through hole 31 of the heat dissipation plate 3 to weld on the positive electrode connecting portion 22 of the substrate 2, meanwhile, the negative electrode elastic element 6 is sleeved the outer edge of the assembling portion 41 of the fixing base 4, and the negative electrode pin 61 of the negative electrode elastic element 6 is passed through the negative electrode perforation 43 of the fixing base 4 and the negative electrode through hole 32 of the heat dissipation plate 3 to weld on the negative electrode connecting portion 23 of the substrate 2. Then,

the fixing plate 1 is set at the outer side of the substrate 2 and is screwed by the screw 121 passing through the screw hole 12 of the fixing plate 1 and the screwing hole 44 of the fixing base 4 for elastic element, completing the assembly of the light source module.

[0031] Please refer to Fig. 4, which is a side sectional view of a light source module in use according to an embodiment of the present invention. The assembled light source module, comprising the fixing plate 1, the substrate 2, the heat dissipation plate 3, the fixing base 4 for elastic element, the positive electrode elastic element 5, and the negative electrode elastic element 6, is set inside a flashlight shell 7, and a battery 8 is put into the flashlight shell 7, making the positive electrode elastic element 5 contact the positive electrode of the battery 8 and making the negative electrode elastic element 6 contact the negative electrode of the battery 8, thereby making the illuminate element 21 of the substrate 2 light using the energy provided by the battery 8.

[0032] According to the above description and embodiments, comparison with the existing structure of the light source module, the light source module of the present invention has the advantage as following:

In the light source module of the present invention, the positive and negative electrode elastic elements is conducted by contacting the battery via directly connecting the positive and negative electrode pins to the positive and negative connecting portion of the substrate, so the assembly of the light source module of the present invention is easier and more convenient, the bad connection or short circuit is not occurred, and the inner resistance and the power consumption are decreased.

[0033] In the light source module of the present invention, the positive and negative electrode elastic elements are conducted by contacting the battery via directly connecting the positive and negative electrode pins to the positive and negative connecting portion of the substrate, so the power is transmitted without passing the reflector lamp cup, not only the material and the performance choice of the reflector lamp cup is more flexible and convenient, further decreasing the manufacture cost and increasing the utility.

Claims

1. A light source module, comprising:

a fixing plate (1), formed with an aperture (11) in the center;

a substrate (2), set at an inner side of the fixing plate (1), connected with an illuminate element (21) at where corresponding to the aperture (11) of the fixing plate (1), and formed with a positive electrode connecting portion (22) and a negative electrode connecting portion (23) to respectively electrically connect to a positive electrode and a negative electrode of the illuminate element

(21);

a heat dissipation plate (3), set at an inner side of the substrate (2) and formed with a positive electrode through hole (31) and a negative electrode through hole (32) respectively at where corresponding to the positive electrode connecting portion (22) and the negative electrode connecting portion (23); **characterised by**

a fixing base (4) for elastic element, set at an inner side of the heat dissipation plate (3), having an assembling portion (41), and formed with a positive electrode perforation (42) and a negative electrode perforation (43) respectively at where corresponding to the positive and the negative electrode through holes (31, 32) of the heat dissipation plate (3);

a positive electrode elastic element (5), sleeved inside the assembling portion (41) of the fixing base (4) and formed with a positive electrode pin (51) which connected with the positive electrode connecting portion (22) of the substrate (2) by passing through the positive electrode perforation (42) of the fixing base (4) and the positive electrode through hole (31) of the heat dissipation plate (3); and

a negative electrode elastic element (6), sleeved at an outer edge of the assembling portion (41) of the fixing base (4) and formed with a negative electrode pin (61) which connected with the negative electrode connecting portion (23) of the substrate (2) by passing through the negative electrode perforation (43) of the fixing base (4) and the negative electrode through hole (32) of the heat dissipation plate (3).

2. The light source module according to claim 1, wherein the fixing plate (1) is formed of a plastic material.

3. The light source module according to claim 1, wherein the fixing plate (1) comprises a screw hole (12) at an outer edge thereof, and the fixing base (4) for elastic element comprises a screwing hole (44) at where corresponding to the screw hole (12) of the fixing plate (1), for fixing a screw (121) in the screw hole (12) and the screwing hole (44).

4. The light source module according to claim 1, wherein the heat dissipation plate (3) is formed of aluminum.

5. The light source module according to claim 1, wherein the fixing base (4) for elastic element is formed of a plastic material.

6. The light source module according to claim 1, wherein the positive electrode pin (51) of the positive electrode elastic element (5) is welded on the positive electrode connecting portion (22) of the substrate

(2).

7. The light source module according to claim 1, wherein the negative electrode pin (61) of the negative electrode elastic element (6) is welded on the negative electrode connecting portion (23) of the substrate (2).

Patentansprüche

1. Lichtquellenmodul, aufweisend:

eine Befestigungsplatte (1), die mittig mit einem Lichtübertragungsloch (11) versehen ist;
ein Substrat (2), das auf der Innenseite der Fixierplatte (1) angeordnet ist, wobei das Substrat (2) im Bereich des Lichtübertragungslochs (11) der Befestigungsplatte (1) mit einem Licht emittierendes Element (21) versehen ist, und wobei das Substrat (2) einen mit einem Pluspol elektrisch verbundenen Pluspolanschluss (22) und einen mit einem Minuspol elektrisch verbundenen Minuspolanschluss (23) aufweist;

eine wärmeableitende Platte (3), die in Kontakt mit der Innenseite des Substrats (2) angeordnet ist, wobei die wärmeableitende Platte (3) eine dem Pluspolanschluss (22) entsprechende Pluspol-Bohrung (31) und eine dem Minuspolanschluss (23) entsprechende Minuspol-Bohrung (32) aufweist,

dadurch gekennzeichnet,

dass ein Federelement-Befestigungssitz (4) an der Innenseite der Wärmeableitungsplatte (3) angeordnet und mit einem Ringvorsprung (41) versehen ist, wobei der Federelement-Befestigungssitz (4) eine der Pluspol-Bohrung (31) entsprechende Befestigungssitz-Pluspolbohrung (42) und eine der Minuspol-Bohrung (32) entsprechende Befestigungssitz-Minuspolbohrung (43) aufweist;

dass ein Pluspol-Federelement (5) in einen von dem Ringvorsprung (41) begrenzten Innenraum eingebaut ist, wobei das Pluspol-Federelement (5) einen Pluspol-Kontaktschenkel (51) aufweist, der durch die Befestigungssitz-Pluspolbohrung (42) des Federelement-Befestigungssitzes (4) und die Pluspol-Bohrung (31) der wärmeableitenden Platte (3) hindurchgeht und im Pluspolanschluss (22) des Substrats (2) befestigt ist; und

dass ein Minuspol-Federelement (6) auf dem Außenumfang des Ringvorsprungs (41) montiert ist, wobei das Minuspol-Federelement (6) einen Minuspol-Kontaktschenkel (61) aufweist, der durch die Befestigungssitz-Minuspolbohrung (43) des Federelement-Befestigungssitzes (4) und die Minuspol-Bohrung (32) der wärme-

ableitenden Platte (3) hindurchgeht und im Minuspolanschluss (23) des Substrats (2) befestigt ist.

2. Lichtquellenmodul nach Anspruch 1, **dadurch gekennzeichnet, dass** die Befestigungsplatte (1) aus Kunststoff hergestellt ist.
3. Lichtquellenmodul nach Anspruch 1, **dadurch gekennzeichnet, dass** die Befestigungsplatte (1) außenumfangsseitig ein Schraubenloch (12) aufweist, wobei der Federelement-Befestigungssitz (4) eine dem Schraubenloch (12) der Befestigungsplatte (1) entsprechende Schraubenbohrung (44) besitzt, in die ein Schraubelement (121) einschraubbar ist.
4. Lichtquellenmodul nach Anspruch 1, **dadurch gekennzeichnet, dass** die wärmeableitende Platte (3) aus Aluminium hergestellt ist.
5. Lichtquellenmodul nach Anspruch 1, **dadurch gekennzeichnet, dass** der Federelement-Befestigungssitz (4) aus Kunststoff hergestellt ist..
6. Lichtquellenmodul nach Anspruch 1, **dadurch gekennzeichnet, dass** der Pluspol-Kontaktschenkel (51) des Pluspol-Federelements (5) mit dem Pluspolanschluss (22) des Substrats (2) verschweißt ist.
7. Lichtquellenmodul nach Anspruch 1, **dadurch gekennzeichnet, dass** der Minuspol-Kontaktschenkel (61) des Minuspol-Federelements (6) mit dem Minuspolanschluss (23) des Substrats (2) verschweißt ist.

Revendications

1. Un module formant source de lumière, comprenant :

une plaque de fixation (1), formée avec une ouverture (11) au centre ;

un substrat (2), placé sur un côté intérieur de la plaque de fixation (1), relié à un élément d'éclairage (21) à l'endroit correspondant à l'ouverture (11) de la plaque de fixation (1), et formé avec une partie (22) de connexion d'électrode positive et une partie (23) de connexion d'électrode négative pour connecter électriquement respectivement une électrode positive et une électrode négative de l'élément d'éclairage (21) ;

une plaque (3) de dissipation de chaleur, placée sur un côté intérieur du substrat (2) et formée avec un trou traversant (31) d'électrode positive et un trou traversant (32) d'électrode négative respectivement à l'endroit correspondant à la partie (22) de connexion d'électrode positive et la partie (23) de connexion d'électrode

- négative ;
caractérisé par
 une embase de fixation (4) pour un élément élastique, fixé sur un côté intérieur de la plaque (3) de dissipation de chaleur, ayant une partie d'assemblage (41), et formé avec une perforation (42) d'électrode positive et une perforation (43) d'électrode négative respectivement à l'endroit correspondant aux trous traversants (31, 32) d'électrodes positive et négative de la plaque (3) de dissipation de chaleur ;
 un élément élastique (5) d'électrode positive, engagé étroitement à l'intérieur de la partie d'assemblage (41) de l'embase de fixation (4) et formé avec une broche (51) d'électrode positive qui est reliée à la partie (22) de connexion d'électrode positive du substrat (2) en passant à travers la perforation (42) d'électrode positive de l'embase de fixation (4) et le trou traversant (31) d'électrode positive de la plaque (3) de dissipation de chaleur, et
 un élément élastique (6) d'électrode négative, engagé étroitement au niveau d'un bord extérieur de la partie d'assemblage (41) de l'embase de fixation (4) et formé avec une broche (61) d'électrode négative qui est reliée à la partie (23) de connexion d'électrode négative du substrat (2) en passant à travers la perforation (43) d'électrode négative de l'embase de fixation (4) et le trou traversant (32) d'électrode négative de la plaque (3) de dissipation de chaleur.
2. Le module d'éclairage selon la revendication 1, dans lequel la plaque de fixation (1) est en matière plastique.
3. Le module d'éclairage selon la revendication 1, dans lequel la plaque de fixation (1) comprend un trou à vis (12) sur un de ses bords extérieurs, et l'embase de fixation (4) pour élément élastique comprend un trou de vissage (44) correspondant à l'emplacement du trou à vis (12) de la plaque de fixation (1), pour fixer une vis (121) dans le trou à vis (12) et le trou de vissage (44).
4. Le module formant source de lumière selon la revendication 1, dans lequel la plaque (3) de dissipation de chaleur est formée d'aluminium.
5. Le module d'éclairage selon la revendication 1, dans lequel l'embase de fixation (4) pour élément élastique est formée d'une matière plastique.
6. Le module formant source de lumière selon la revendication 1, dans lequel la broche (51) d'électrode positive de l'élément élastique (5) d'électrode positive est soudée sur la partie de connexion (22) de l'électrode positive du substrat (2).
7. Le module formant source de lumière selon la revendication 1, dans lequel la broche d'électrode négative (61) de l'élément élastique (6) d'électrode négative est soudée sur la partie (23) de connexion d'électrode négative du substrat (2).

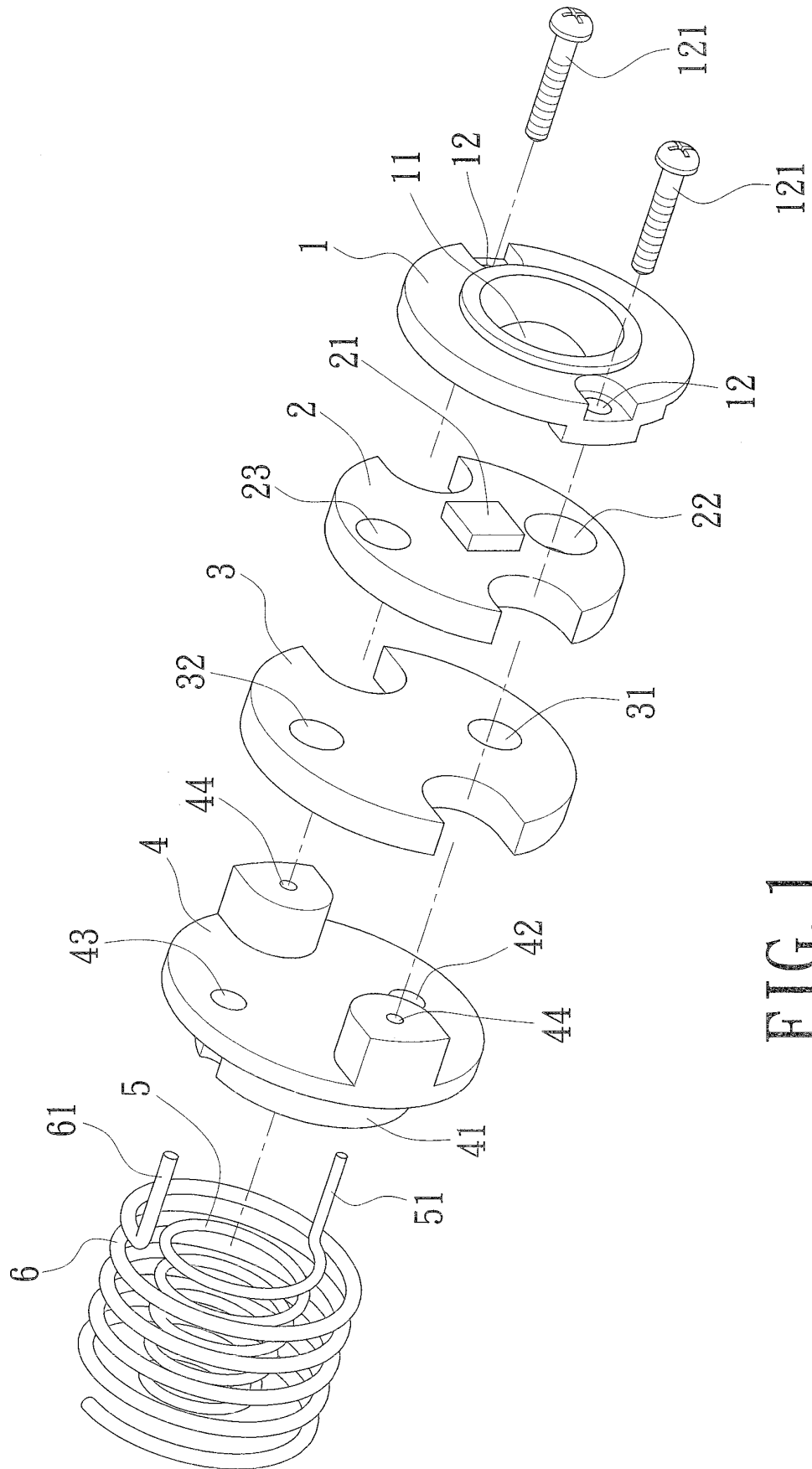


FIG. 1

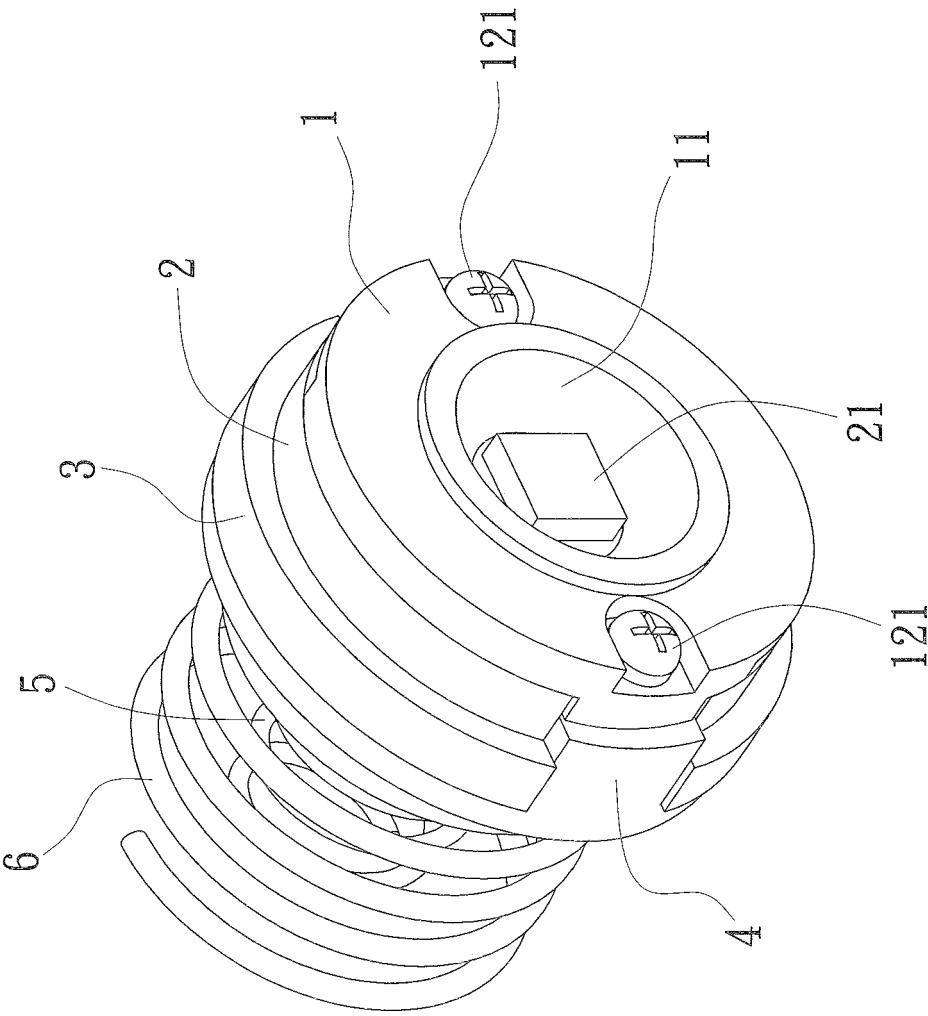


FIG. 2

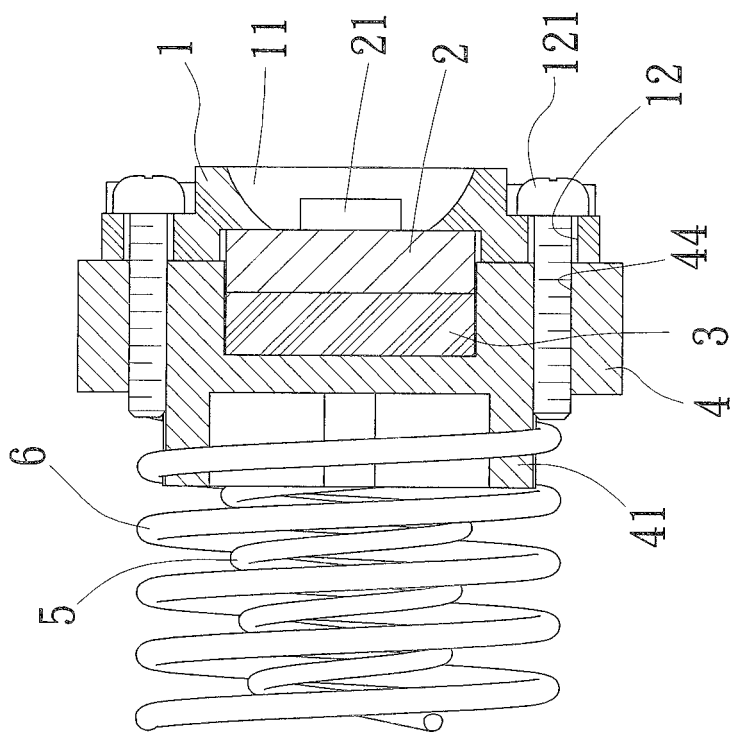


FIG. 3

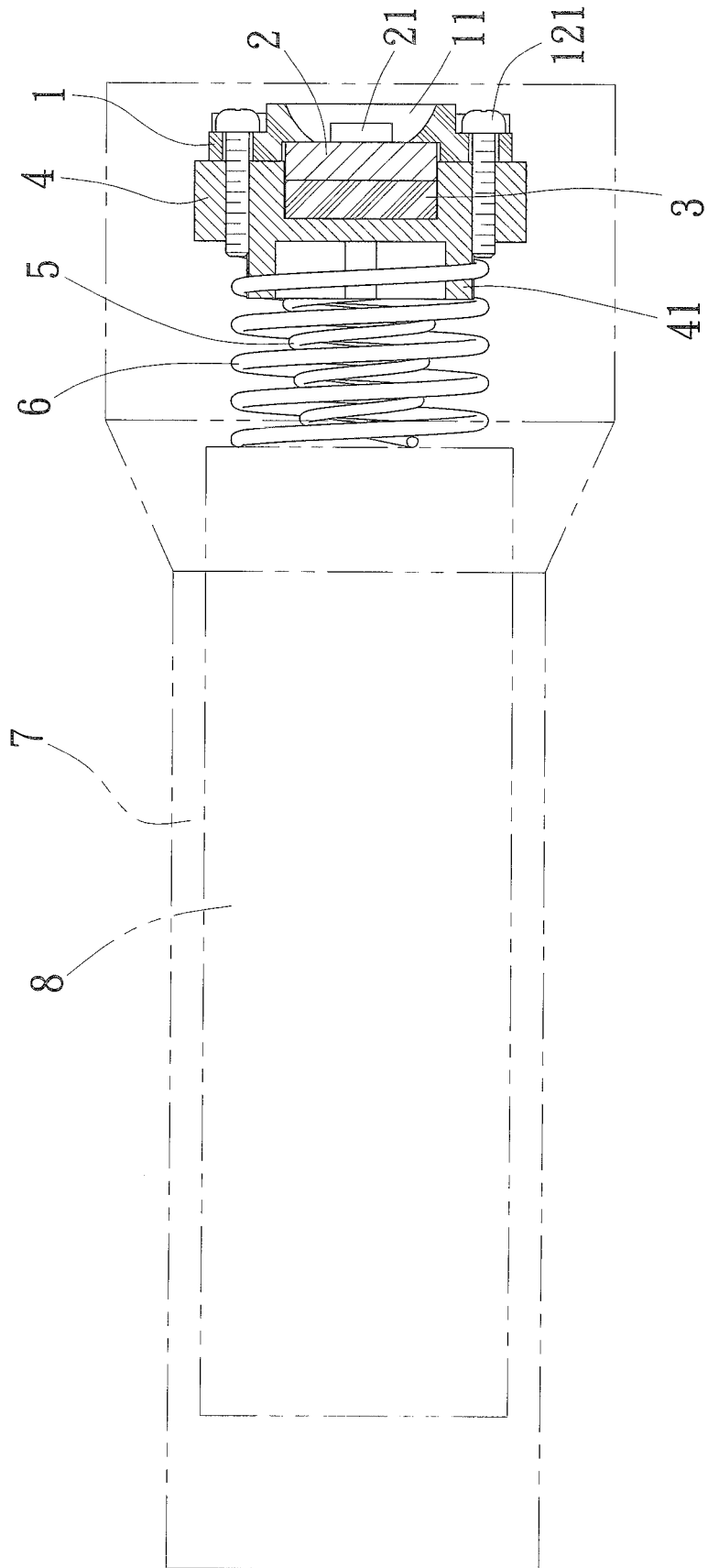


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20070236920 A [0007]