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(54) **Heat-dissipating assembly of LED lamp holder**

Wärmeableitende Anordnung eines LED-Lampenhalters

Ensemble à dissipation de chaleur de support de lampe à DEL

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a LED lamp, and in particular to a heat-dissipating assembly of a LED lamp holder. An assembly according to the preamble of claim 1 is disclosed in DE 10 2007 042 978.

2. Description of Prior Art

[0002] Light-emitting diodes (LED) are widely used as light sources in lighting. However, since the LED is an electronic element, it has to be waterproof and dust-proof when being applied to an outdoor lamp. Further, the heat-dissipating performance of the LED has to be also taken into consideration.

[0003] The current heat-dissipating assembly in a LED lamp holder continues using a heat sink or heat-dissipating device in a computer host. A heat-conducting plate is brought into contact with a heat source. Then, heat pipes are connected to transmit the heat to the lamp cover or heat-dissipating fins, thereby cooling the heat source. However, the above-mentioned members have to be fixedly connected to each other with a superior heat-conducting effect, such as by means of tin paste or adhesive heat-conducting paste. Therefore, it is impossible to detach these members after being assembled together, which makes more difficult to replace the damaged components in the future. Since it is unable to replace the damaged components, the whole lamp holder should be replaced, which causes the waste in cost.

[0004] Therefore, in order to overcome the above problems, the present Inventor proposes a reasonable and novel structure based on his delicate researches and expert experiments.

SUMMARY OF THE INVENTION

[0005] The present invention is to provide an assembly of a LED lamp holder. Without affecting the contact between a heat-dissipating device and a heat source of a LED unit, a detachable assembly is provided, so that the components within the LED lamp holder can be replaced. Especially, after being detached, the contact between the heat-dissipating device and the heat source of the LED unit will not be affected.

[0006] The present invention is to provide an assembly of a LED lamp holder, which includes a lamp cover and a heat-dissipating device provided in the lamp cover. An accommodating inlet is provided on the lamp cover. A LED unit is provided below the lamp cover. A cover plate covers the accommodating inlet. The heat-dissipating device comprises a heat-absorbing plate, a heat-dissipating plate and a heat pipe connected between the heat-absorbing plate and the heat-dissipating plate. The heat-

absorbing plate is brought into contact with the LED unit, while the heat-dissipating plate is brought into contact with the cover plate. The cover plate is penetrated by a plurality of screw elements. Each of the screw elements is screwed to the heat-absorbing plate. The length of each screw element exactly makes the heat-absorbing plate to abut and contact the LED unit, and the respective screw elements can keep this state. The heat-dissipating device is assembled with the cover plate to form a detachable assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

Fig. 1 is a partially exploded perspective view of the present invention;

Fig. 2 is an assembled view showing the internal structure of the present invention;

Fig. 3 is an assembled view showing the heat-dissipating structure of the present invention; and

Fig. 4 is a cross-sectional view of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0008] In order to make the Examiner to better understand the characteristics and technical contents of the present invention, a detailed description relating thereto will be made with reference to the accompanying drawings. However, the drawings are illustrative only but not used to limit the present invention.

[0009] Please refer to Figs. 1 and 2. Fig. 1 is an exploded perspective view of the present invention, and Fig. 2 is an assembled view showing the internal structure of the present invention. The present invention provides an assembly of a LED lamp holder, which includes a lamp cover 1 and a heat-dissipating device 2 provided in the lamp cover 1.

[0010] The lamp cover 1 is constituted of a base 10 and an upper cover 11. A LED unit 3 is disposed below the base 10. The LED unit 3 comprises a circuit board 30 and a plurality of light-emitting diodes 31 provided on the circuit board 30, so that the light emitted by each of the light-emitting diodes 31 of the LED unit 3 can project toward the underside of the lamp cover 1 (Fig. 4). Each of the front and rear sides of the base 10 is formed with an upright shielding plate 12. The slightly-curved upper cover 11 spans between the two shielding plates 12. Air holes 120 are provided on the shielding plate 12.

[0011] Please also refer to Fig. 3. The heat-dissipating device 2 is provided in the lamp cover 1 and comprises a heat-absorbing plate 20, at least one heat pipe 21 and a heat-dissipating plate 22. The heat-absorbing plate 20 is brought into contact with the back surface of the LED unit 3 to facilitate the heat dissipation of the LED unit 3. In the present embodiment shown in Fig. 4, on the back surface of the LED unit 3, a heat-conducting substrate

32 is adhered. The bottom surface of the heat-conducting substrate 32 is provided with a trough 320 for allowing the LED unit 3 to be accommodated in the trough 320.

[0012] According to the above, the heat-absorbing plate 20 is provided with at least one groove 200 for allowing one end of the heat pipe 21 to be embedded therein. The groove 200 is preferably located on the bottom surface of the heat-absorbing plate 20, so that it can be adhered to the heat source of the LED unit 3 more closely. Further, the heat-dissipating plate 22 is provided with at least one groove 220 for allowing the other end of the heat pipe 21 to be embedded therein. The groove 220 is preferably located on the top surface of the heat-dissipating plate 22, so that it can be further distant from the heat source of the LED unit 3. On the other hand, as shown in Fig. 1, the upper cover 11 of the lamp cover 1 is provided with an accommodating inlet 110 that is positioned to correspond to the heat-dissipating device 2 for allowing the heat-dissipating device 2 to pass through. A cover plate 13 covers the accommodating inlet 110. The heat-dissipating plate 22 of the heat-dissipating device 2 is adhered to the underside of the cover plate 13.

[0013] According to the present invention, the cover plate 13 is assembled to the upside of the heat-dissipating device 2. Then, via the accommodating inlet 2, the heat-dissipating device 2 is assembled in the lamp cover 1, so that the underside of the heat-dissipating device 2 can be brought into contact with the heat source of the LED unit 3. At this time, a plurality of screw elements 14 such as bolts are used to penetrate the cover plate 13 to be screwed on the heat-absorbing plate 20. In the present embodiment, the cover plate 13 is provided with through-holes 130 for allowing the screw elements 14 to pass through. Further, the heat-absorbing plate 20 is provided with screw holes 201 for allowing the screw elements 14 to be screwed therein. In addition, the cover plate 13 is provided with through-holes 131 for allowing screws 15 to pass through. The through-holes 131 are positioned to correspond to the screw holes 221 on the heat-dissipating plate 22, so that the cover plate 13 and the heat-dissipating plate 22 can be brought into contact with each other via the screws. Further, when the cover plate 13 covers the accommodating inlet 110, screws 16 may pass through the through-holes 132 to fasten the upper cover 11 to screw holes 111 near the periphery of the accommodating inlet 110, thereby completing the assembly.

[0014] According to the above, as shown in Fig. 4, the length of the screw element 14 is preset to make the heat-absorbing plate 20 abut the back surface of the LED unit 3 or contact the top surface of the heat-conducting substrate 32. In this way, when the heat-dissipating device 2 and the cover plate 13 are assembled on the upper cover 11, the heat-absorbing plate 20 of the heat-dissipating device 2 can be brought into contact with the heat source of the LED unit 3 surely. Also, the present invention forms a detachable assembly, so that it is convenient to replace the components within this assembly in the

future.

[0015] According to the above, via the above constitution, the assembly of LED lamp holder of the present invention can be achieved.

[0016] Therefore, according to the assembly of the LED lamp holder of the present invention, since each of the screw elements 14 has an exact length to make the heat-absorbing plate 20 of the heat-dissipating device 2 abut and contact the LED unit 3. Further, via the respective screw elements 14, the above-mentioned state can be kept. Thus, the heat-dissipating device 2 is assembled with the cover plate 13 to form a detachable assembly. Even after detachment and re-assembly, the respective screw elements 14 can still maintain the contact between the heat-absorbing plate 20 and the LED unit 3. Alternatively, a layer of heat-conducting medium such as heat-conducting paste (not shown) can be applied between the heat-absorbing plate 20 and the back surface of the LED unit 3 (or the top surface of the heat-conducting substrate 32). Further, the heat-dissipating device 2 is additionally provided with other heat-dissipating members 23 on the inner periphery of the lamp cover 1.

[0017] According to the above, the present invention already achieves the desired objects and overcomes the problems of prior art.

Claims

1. An assembly of LED lamp holder, comprising:

a lamp cover (1) with an accommodating inlet (110) on a upside thereof and a LED unit (3) on a underside thereof, a cover plate (13) covering the accommodating inlet (110); and
a heat-dissipating device (2) provided in the lamp cover (1) and having a heat-absorbing plate (20), a heat-dissipating plate (22) and a heat pipe (21) connected between the heat-absorbing plate (20) and the heat-dissipating plate (22), the heat-absorbing plate (20) being brought into contact with the LED unit (3), and the heat-dissipating plate (22) being brought into contact with the cover plate (13); **characterized in that**

the cover plate (13) is penetrated by a plurality of screw elements (14), the screw elements (14) are screwed on the heat-absorbing plate (20), and a length of each screw element (14) exactly makes the heat-absorbing plate (20) to abut and contact the LED unit (3) and keeps this state.

2. The assembly of LED lamp holder according to claim 1, wherein the lamp cover (1) is constituted of a base (10) and an upper cover (11), the LED unit (3) is provided under the base (10), and the accommodating inlet (110) is located on the upper cover (11).

3. The assembly of LED lamp holder according to claim 2, wherein each of front and rear sides of the base (10) is formed with an upright shielding plate (12), and the upper cover (11) is curved and spans two shielding plates (12) of the front and rear sides of the base (10). 5
4. The assembly of LED lamp holder according to claim 3, wherein air holes (120) are provided on the two shielding plates (12). 10
5. The assembly of LED lamp holder according to claim 1, wherein the LED unit (3) comprises a circuit board (30) and a plurality of light-emitting diodes (31) on the circuit board (30), a back surface of the circuit board (30) is adhered with a heat-conducting substrate (32), and the heat-absorbing plate (20) is adhered to the heat-conducting substrate (32) and is brought into contact with the LED unit (3). 15
6. The assembly of LED lamp holder according to claim 5, wherein a bottom surface of the heat-conducting substrate (32) is provided with a trough (320) for allowing the LED unit (3) to be embedded therein. 20
7. The assembly of LED lamp holder according to claim 1, wherein the cover plate (13) is provided with through-holes (130) for allowing respective screw elements (14) to pass through, and the heat-absorbing plate (20) is provided with screw holes (201) for allowing the respective screw elements (14) to be screwed therein. 25
8. The assembly of LED lamp holder according to claim 7, wherein the screw element (14) is a bolt. 30
9. The assembly of LED lamp holder according to claim 1, wherein the screw element (14) is a bolt. 35

Patentansprüche

1. Anordnung eines LED-Lampenhalters, umfassend:

- eine Lampenabdeckung (1) mit einem Aufnahmezugang (110) an ihrer Oberseite und einer LED-Einheit an ihrer Unterseite, wobei eine Abdeckplatte (13) den Aufnahmezugang (110) bedeckt; und
- eine wärmeableitende Vorrichtung (2), die innerhalb der Lampenabdeckung (1) bereitgestellt ist, und die eine wärmeabsorbierende Platte (20), eine wärmeableitende Platte (22) und eine Wärmeleitung (21), die zwischen die wärmeabsorbierende Platte (20) und die wärmeableitende Platte (22) angeschlossen ist, aufweist, wobei die wärmeabsorbierende Platte (20) mit der LED-Einheit (3) und die wärmea-

bleitende Platte (22) mit der Abdeckplatte (13) in Kontakt ist;

dadurch gekennzeichnet, dass

die Abdeckplatte (13) von mehreren Schraubenelementen (14) durchdrungen ist, wobei die Schraubenelemente (14) an der wärmeabsorbierenden Platte (20) angeschraubt sind, und wobei eine Länge eines jeden Schraubenelements (14) genau ausgelegt ist, um die wärmeabsorbierende Platte (20) an die LED-Einheit (3) zur Anlage zu bringen und sie mit dieser in Kontakt zu bringen, sowie diesen Zustand aufrecht zu erhalten.

2. Anordnung eines LED-Lampenhalters nach Anspruch 1, wobei die Lampenabdeckung (1) aus einer Basis (10) und einer oberen Abdeckung (11) gebildet ist, die LED-Einheit (3) unterhalb der Basis (10) angeordnet ist, und sich der Aufnahmezugang (110) an der oberen Abdeckung (11) befindet. 20
3. Anordnung eines LED-Lampenhalters nach Anspruch 2, wobei jede der Vorder- und Rückseiten der Basis (10) mit einer aufrechten Abschirmplatte (12) ausgebildet ist, und die obere Abdeckung (11) gekrümmt ist und die zwei Abschirmplatten (12) der Vorder- und Rückseiten der Basis (10) umfasst. 25
4. Anordnung eines LED-Lampenhalters nach Anspruch 3, wobei die beiden Abschirmplatten (12) mit Luftlöchern (120) versehen sind. 30
5. Anordnung eines LED-Lampenhalters nach Anspruch 1, wobei die LED-Einheit (3) eine Leiterplatte (30) und mehrere lichtemittierende Dioden (31) auf der Leiterplatte (30) umfasst, eine Rückseite der Leiterplatte (30) mit einem wärmeleitenden Substrat (32) verklebt ist, und wobei die wärmeabsorbierende Platte (20) mit dem wärmeleitenden Substrat (32) verklebt und in Kontakt mit der LED-Einheit (3) ist. 35
6. Anordnung eines LED-Lampenhalters nach Anspruch 5, wobei eine Unterseite des wärmeleitenden Substrats (32) mit einer Mulde (320) versehen ist, die zur Aufnahme der LED-Einheit (3) vorgesehen ist. 40
7. Anordnung eines LED-Lampenhalters nach Anspruch 1, wobei die Abdeckplatte (13) mit Durchgangslöchern (130) versehen ist, die einen Durchgang entsprechender Schraubenelemente (14) erlauben, und die wärmeabsorbierende Platte (20) mit Schraubenlöchern (201) versehen ist, so dass die entsprechenden Schraubenelemente (14) darin eingeschraubt werden können. 45
8. Anordnung eines LED-Lampenhalters nach Anspruch 7, wobei das Schraubenelement (14) ein Bol-

zen ist.

9. Anordnung eines LED-Lampenhalters nach Anspruch 1, wobei das Schraubenelement (14) ein Bolzen ist.

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Revendications

1. Assemblage de porte-lampes à diodes électroluminescentes (DEL), comprenant :

un couvre-lampe (1) avec une entrée de réception (110) sur une face supérieure de lui-même et une unité à DEL (3) sur une face inférieure de lui-même, une plaque de couverture (13) qui couvre l'entrée de réception (110) ; et un dispositif de dissipation de chaleur (2) prévu dans le couvre-lampe (1) et ayant une plaque d'absorption de chaleur (20), une plaque de dissipation de chaleur (22) et un tube caloporteur (21) connecté entre la plaque d'absorption de chaleur (20) et la plaque de dissipation de chaleur (22), la plaque d'absorption de chaleur (20) étant amenée en contact avec l'unité à DEL (3), et la plaque de dissipation de chaleur (22) étant amenée en contact avec la plaque de couverture (13) ;

caractérisé en ce que la plaque de couverture (13) est pénétrée par une pluralité d'éléments à vis (14), les éléments à vis (14) sont vissés sur la plaque d'absorption de chaleur (20), et une longueur de chaque élément à vis (14) amène exactement la plaque d'absorption de chaleur (20) à venir en butée et en contact avec l'unité à DEL (3) et à maintenir cette situation.

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2. Assemblage de porte-lampes à DEL selon la revendication 1, dans lequel le couvre-lampe (1) est constitué d'une base (10) et d'un couvercle supérieur (11), l'unité à DEL (3) est prévue sous la base (10), et l'entrée de réception (110) est située sur le couvercle supérieur (11).

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3. Assemblage de porte-lampes à DEL selon la revendication 2, dans lequel chacun des côtés avant et arrière de la base (10) est formé avec une plaque-écran verticale (12), et le couvercle supérieur (11) est incurvé et coiffe deux plaques-écrans (12) des côtés avant et arrière de la base (10).

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4. Assemblage de porte-lampes à DEL selon la revendication 3, dans lequel des trous à air (120) sont prévus sur les deux plaques-écrans (12).

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5. Assemblage de porte-lampes à DEL selon la revendication 1, dans lequel l'unité à DEL (3) comprend

une carte à circuits (30) et une pluralité de diodes électroluminescentes (31) sur la carte à circuits (30), une surface postérieure de la carte à circuits (30) est assemblée par adhérence avec un substrat thermoconducteur (32), et la plaque d'absorption de chaleur (20) est assemblée par adhérence avec le substrat thermoconducteur (32) et est amenée en contact avec l'unité à DEL (3).

6. Assemblage de porte-lampes à DEL selon la revendication 5, dans lequel une surface inférieure du substrat thermoconducteur (32) est pourvue d'une auge (320) pour permettre d'y noyer l'unité à DEL (3).

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7. Assemblage de porte-lampes à DEL selon la revendication 1, dans lequel la plaque de couverture (13) est pourvue de trous traversants (130) pour permettre la traversée d'éléments à vis (14) respectifs, et la plaque d'absorption de chaleur (20) est pourvue de trous à vis (201) pour permettre d'y visser les éléments à vis (14) respectifs.

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8. Assemblage de porte-lampes à DEL selon la revendication 7, dans lequel l'élément à vis (14) est un boulon.

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9. Assemblage de porte-lampes à DEL selon la revendication 1, dans lequel l'élément à vis (14) est un boulon.

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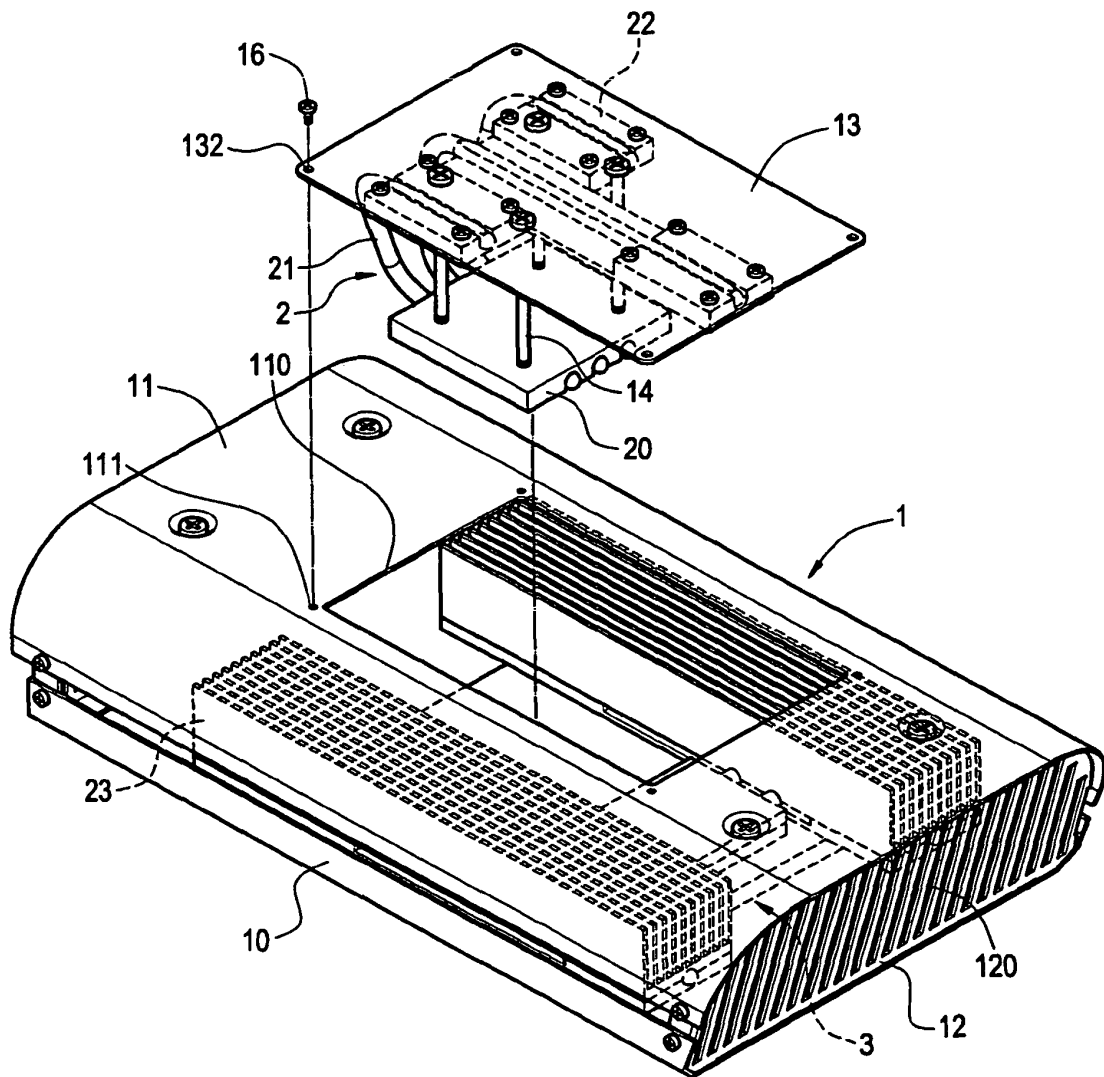


FIG.1

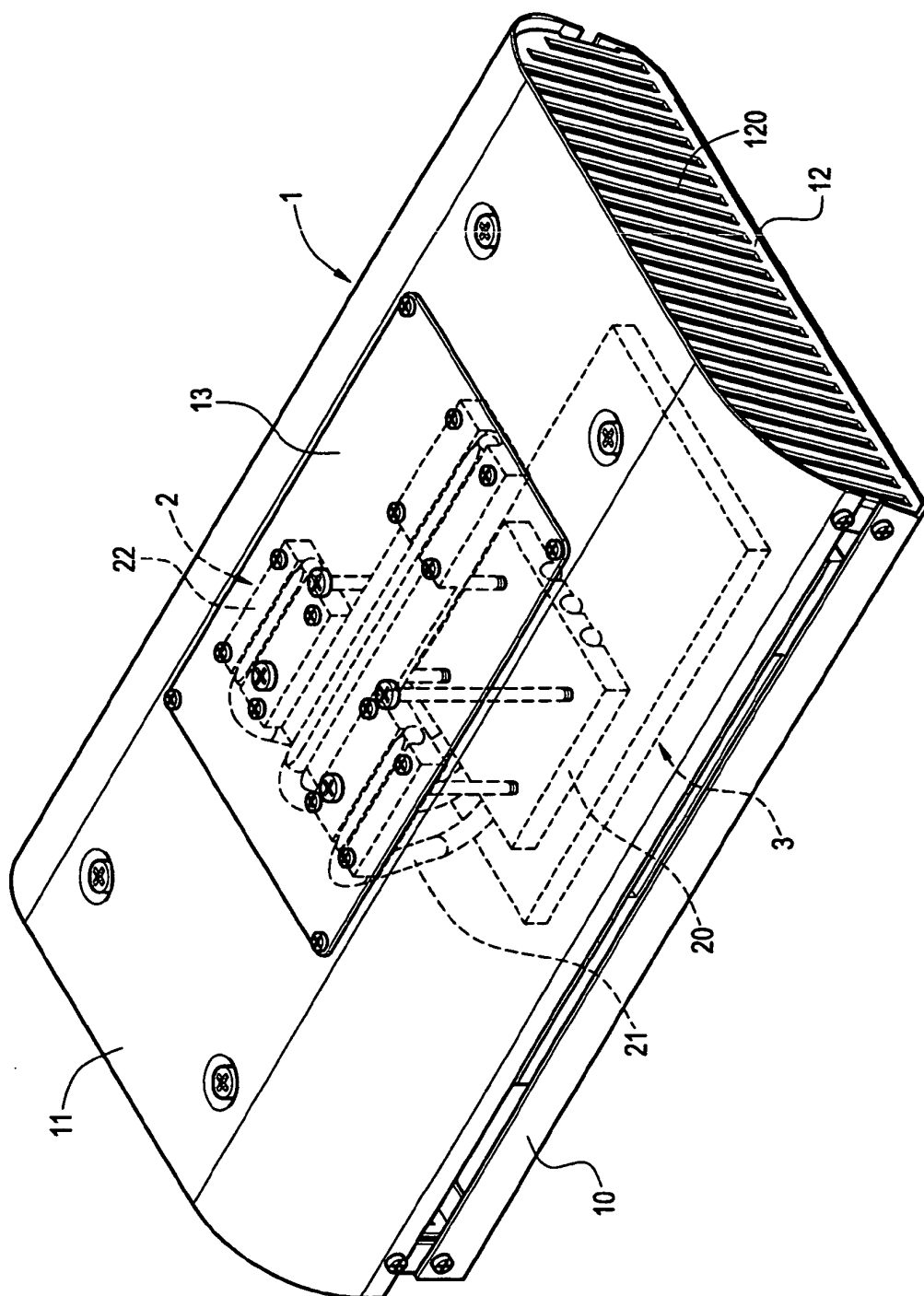


FIG.2

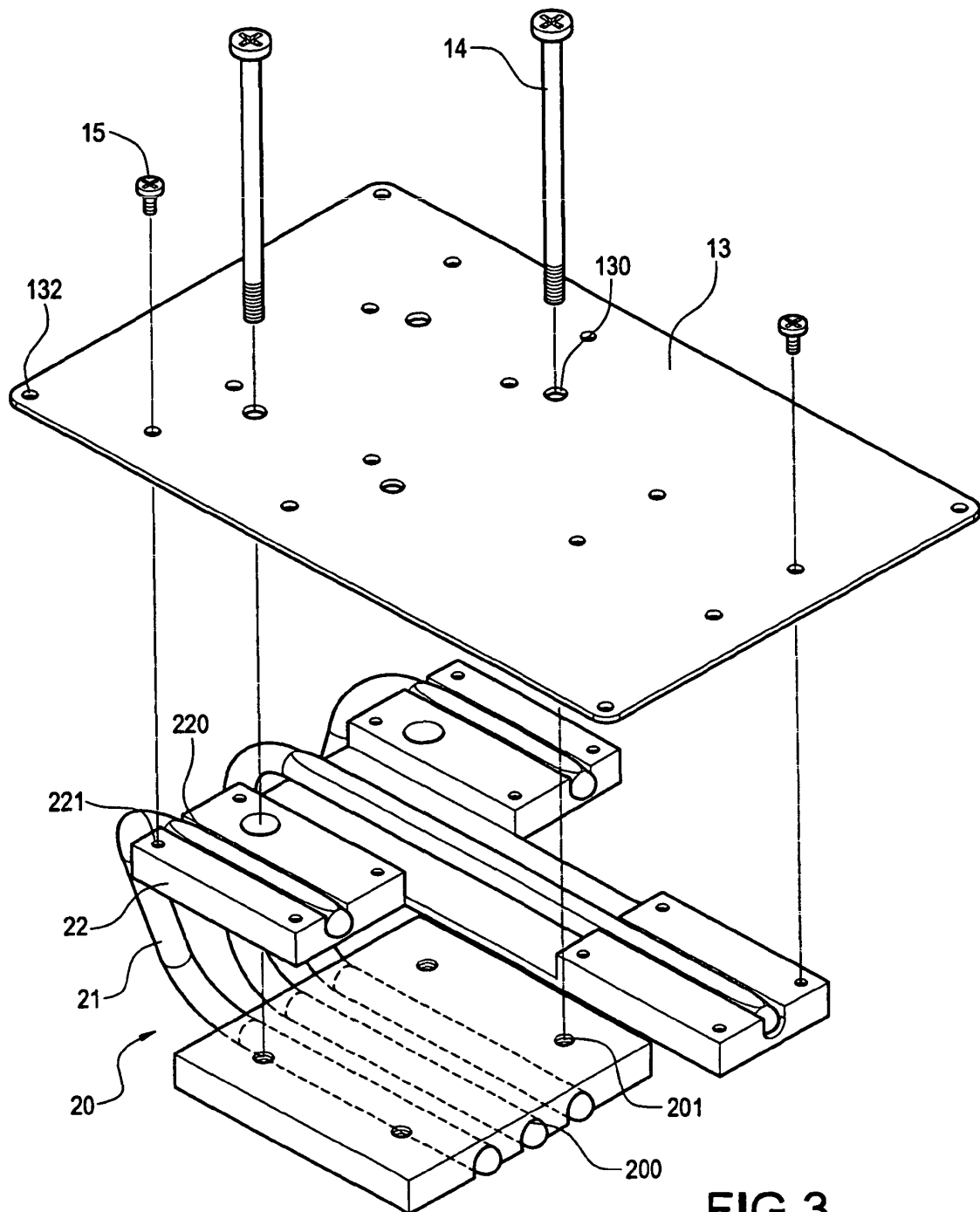


FIG.3

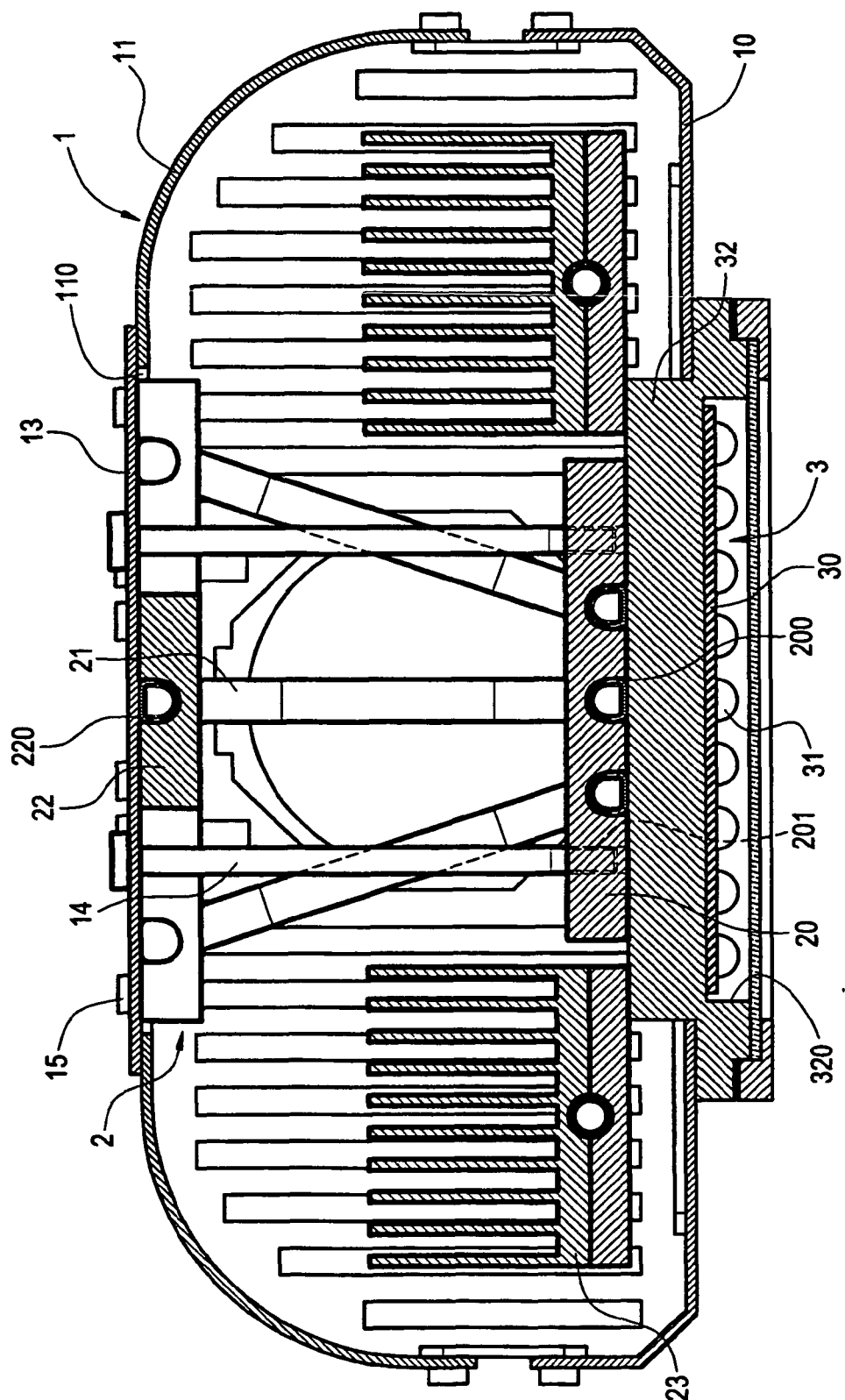


FIG.4

REFERENCES CITED IN THE DESCRIPTION

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