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(72) Inventor: **Chuan, Tang Shih**
Shulin City, Taipei County (TW)

(74) Representative: **Zeitler - Volpert - Kandlbinder**
Patentanwälte,
Postfach 26 02 51
80059 München (DE)

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(71) Applicants:
• **Chuan, Tang Shih**
Shulin City, Taipei County (TW)
• **TONS LIGHTOLOGY INC.**
Shulin City, Taipei County (TW)

Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) **Light-emitting diode (LED) lamp with a cooling seat**

(57) An improved cooling seat of LED lamp, of which LED lamp comprising: a main body (10), a LED baseplate (20), a light projector (30) and a cooling seat (40): a main body (10), which is provided with an inner space (11) forming an open end and an inner wall (13); a reducing through-hole (14), which is opened on the inner wall (13) of the inner space (11), while a front (15) and rear (16) stop edges are formed on the wall of the reducing through-hole (14); a LED baseplate (20), which is assembled in the inner space (11) of the main body (10), with its back side sustained by the front stop edge (15);

a cooling seat (40), one end of which is provided with an insertion portion (41) for plugging into the reducing through-hole (14) on the inner wall (13), and the end surface (42) of the cooling seat (40) is contacted sustained by the back side of LED baseplate (20); moreover, a retaining edge (43) is arranged around the other end of the cooling seat (40) for positioning at the rear stop edge; a light projector (30), which is assembled onto the open end of the inner space (11) of the main body (10); a locator (50), which is assembled on the LED baseplate (20) in alignment with the cooling seat (40), enabling the positioning of the LED baseplate (20) and cooling seat (40).

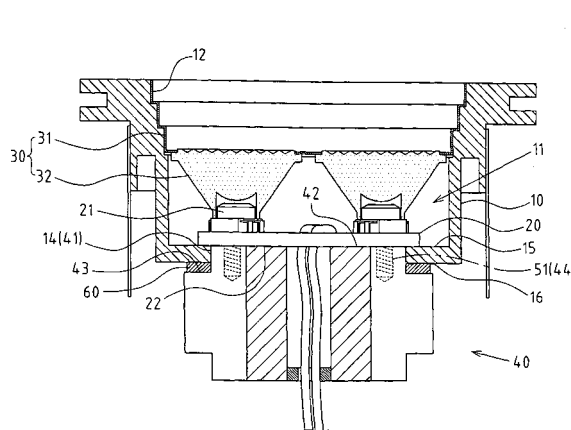


FIG. 4

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates generally to a light-emitting diode (LED) lamp, and more particularly to an innovative lamp with a combined cooling seat structure.

2. Description of Related Art Including Information Disclosed Under 37 CFR 1.97 and 37 CFR 1.98.

[0002] To reduce overheating during operation of an LED lamp, a cooling seat structure is incorporated into existing LED lamps for elimination of heat.

[0003] The addition of the cooling seat will lead to increases in assembly time and costs. A key technology issue is how to realize the combination and positioning of the cooling seat with the most simple structure.

[0004] As for a combined cooling seat of a typical LED lamp, the LED baseplate is first assembled onto the heating surface of the cooling seat. Then, the cooling seat is positioned onto the preset location of LED lamp body, but these two procedures will bring about time-consuming and expensive assembly, making it necessary to make improvements.

[0005] Thus, to overcome the aforementioned problems of the prior art, it would be an advancement in the art to provide an improved structure that can significantly improve efficacy.

[0006] Therefore, the inventor has provided the present invention of practicability after deliberate design and evaluation based on years of experience in the production, development and design of related products.

BRIEF SUMMARY OF THE INVENTION

[0007] There is enhanced efficacy of the present invention.

[0008] The cooling seat of an LED lamp of the present invention is assembled through a single locator, in combination with the front and rear stop edges on the inner wall of the main body for limitation of the LED baseplate and cooling seat. The cooling seat and main body of the LED lamp is assembled with the LED baseplate more simply and quickly through a single locator, thereby reducing the assembly cost and improving the economic efficiency with a better heat transfer effect.

[0009] There are improvements brought about by this invention.

[0010] Based on the structure of the soft pad being arranged between the retaining edge of the cooling seat and the rear stop edge of the main body, the cooling seat and LED baseplate are coupled more firmly and securely.

[0011] Although the invention has been explained in relation to its preferred embodiment, it is to be understood

that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

5 BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0012] FIG. 1 shows an assembled perspective view of the preferred embodiment of the present invention.

10 **[0013]** FIG. 2 shows an exploded perspective view of the preferred embodiment of the present invention.

[0014] FIG. 3 shows an exploded sectional view of the preferred embodiment of the present invention.

15 **[0015]** FIG. 4 shows an assembled sectional view of the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] The features and the advantages of the present invention will be more readily understood upon a thoughtful deliberation of the following detailed description of a preferred embodiment of the present invention with reference to the accompanying drawings.

20 **[0017]** FIGS. 1-4 depict preferred embodiments of a combined cooling seat of an LED lamp of the present invention. The embodiments are provided only for explanatory purposes with respect to the patent claims.

25 **[0018]** The LED lamp A comprises a main body 10, a LED baseplate 20, a light projector 30, and a cooling seat 40. The main body 10 is provided with an inner space 11, which forms an open end 12 and an inner wall 13. The LED baseplate 20 is mounted into the inner space 11, and some LEDs 21 are placed in front of the LED baseplate 20. The light projector 30 is assembled in the open end 12 of the inner space 11.

30 **[0019]** The inner wall 13 is provided with a reducing through-hole 14, while a front stop edge 15 and a rear stop edge 16 are formed on the wall of the reducing through-hole 14.

35 **[0020]** The back side 22 of LED baseplate 20 is sustained by the front stop edge 15.

40 **[0021]** One end of the cooling seat 40 is provided with an insertion portion 41 for plugging into the reducing through-hole 14 on the inner wall 13 of the inner space 11. One end surface 42 of the cooling seat 40 is sustained by the back side 22 of LED baseplate 20. Moreover, a retaining edge 43 is arranged around the other end of the cooling seat 40 for positioning at the rear stop edge 16.

45 **[0022]** The LED baseplate 20 and cooling seat 40 are positioned through a locator 50. As shown in the preferred embodiment, the locator 50 is made of a plurality of bolts 51, such that LED baseplate 20 and cooling seat 40 are separately provided with punch hole 23 and screw hole 44. The bolts 51 could be screwed into the screw hole 44 after passing the punch hole 23, thus enabling the positioning of LED baseplate 20 and cooling seat 40.

50 **[0023]** The light projector 30 comprises a light shield

31 and several refraction blocks 32. The light shield 31 is provided with several through-holes 33 for sleeving of the refraction block 32.

[0024] A soft pad 60 is arranged between the retaining edge 43 of cooling seat 40 and the rear stop edge 16 of the main body 10. The soft pad 60 is made of rubber or silica gel, which allows the cooling seat 40 and LED baseplate 20 to be coupled more firmly and securely.

[0025] Based upon above-specified structures, the present invention is operated as follows:

[0026] The LED lamp A of the present invention allows the cooling seat 40 to be integrated and assembled in a more simple way. Referring to FIGS. 3 and 4, when the cooling seat 40, the main body 10 and LED baseplate 20 are to be assembled together, the LED baseplate 20 is inserted into the inner space 11. The back side 22 is sustained by the front stop edge 15 of the reducing through-hole 14. On the other hand, one end of the main body 10 with inner wall 13 is adapted to the main body 10. Then, the insertion portion 41 of the cooling seat 40 is inserted into the reducing through-hole 14 of the inner wall 13. Meanwhile, the end surface 42 of the cooling seat 40 is sustained by the back side 22 of the LED baseplate 20, and the retaining edge 43 of the cooling seat 40 is sustained by the rear stop edge 16 formed on the wall of the reducing through-hole 14. Next, the bolts 51 of the locator 50 could be screwed into the screw hole 44 after passing the punch hole 23 of LED baseplate 20, thus enabling the positioning of LED baseplate 20, cooling seat 40 and main body 10.

[0027] The LED lamp A of the present invention is assembled through a single locator 50, in combination with the front and rear stop edges 15, 16 on the inner wall 13 of the main body 10 which are used for limitation of the LED baseplate 20 and cooling seat 40. Thus, the cooling seat 40 and main body 10 can be positioned quickly. Moreover, the end surface 42 of the cooling seat 40 could be directly sustained by the back side 22 of the LED baseplate 20, thus permitting fast heat radiation with better heat transfer and elimination effect.

Claims

1. An improved cooling seat of LED lamp, of which LED lamp comprising: a main body, a LED baseplate, a light projector and a cooling seat:

a main body, which is provided with an inner space forming an open end and an inner wall;
a reducing through-hole, which is opened on the inner wall of the inner space, while a front and rear stop edges are formed on the wall of the reducing through-hole;
a LED baseplate, which is assembled in the inner space of the main body, with its back side sustained by the front stop edge;
a cooling seat, one end of which is provided with

an insertion portion for plugging into the reducing through-hole on the inner wall, and the end surface of the cooling seat is sustained by the back side of LED baseplate; moreover, a retaining edge is arranged around the other end of the cooling seat for positioning at the rear stop edge; a light projector, which is assembled onto the open end of the inner space of the main body; a locator, which is assembled on the LED baseplate in alignment with the cooling seat, enabling the positioning of the LED baseplate and cooling seat.

2. The improved structure defined in Claim 1, wherein said light projector comprises a light shield and several refraction blocks, of which the light shield is provided with several through-holes for sleeving of the refraction block.
3. The improved structure defined in Claim 1, wherein a soft pad is arranged between the retaining edge of cooling seat and the rear stop edge of the main body.
4. The improved structure defined in Claim 1, wherein said locator is made of bolts, such that LED baseplate and cooling seat are separately provided with punch hole and screw hole; thus, the bolts could be screwed into the screw hole after passing the punch hole, thus enabling the positioning of LED baseplate and cooling seat.

Amended claims in accordance with Rule 137(2) EPC.

1. A LED lamp, which comprising: a main body, a LED baseplate, a light projector and a heat sink:

a main body, which is provided with an inner space forming an open end and an inner wall;
a reducing through-hole, which is opened on the inner wall of the inner space, while a front and rear stop edges are formed on the wall of the reducing through-hole;
a LED baseplate, which is assembled in the inner space of the main body, with its back side sustained by the front stop edge;
a heat sink, one end of which is provided with an insertion portion for plugging into the reducing through-hole on the inner wall, and the end surface of the heat sink is sustained by the back side of LED baseplate; moreover, a retaining edge is arranged around the other end of the heat sink for positioning at the rear stop edge;
a light projector, which is assembled onto the open end of the inner space of the main body;
said light projector comprises a light shield and

several refraction blocks, of which the light shield is provided with several through-holes for sleeving of the refraction block

a locator, which is assembled on the LED baseplate in alignment with the heat sink, enabling the positioning of the LED baseplate and heat sink 5

a soft pad, which is arranged between the retaining edge of heat sink and the rear stop edge of the main body. 10

2. The structure defined in Claim 1, wherein said locator is made of bolts, such that LED baseplate and heat sink are separately provided with punch hole and screw hole; thus, the bolts could be screwed into the screw hole after passing the punch hole, thus enabling the positioning of LED baseplate and heat sink. 15

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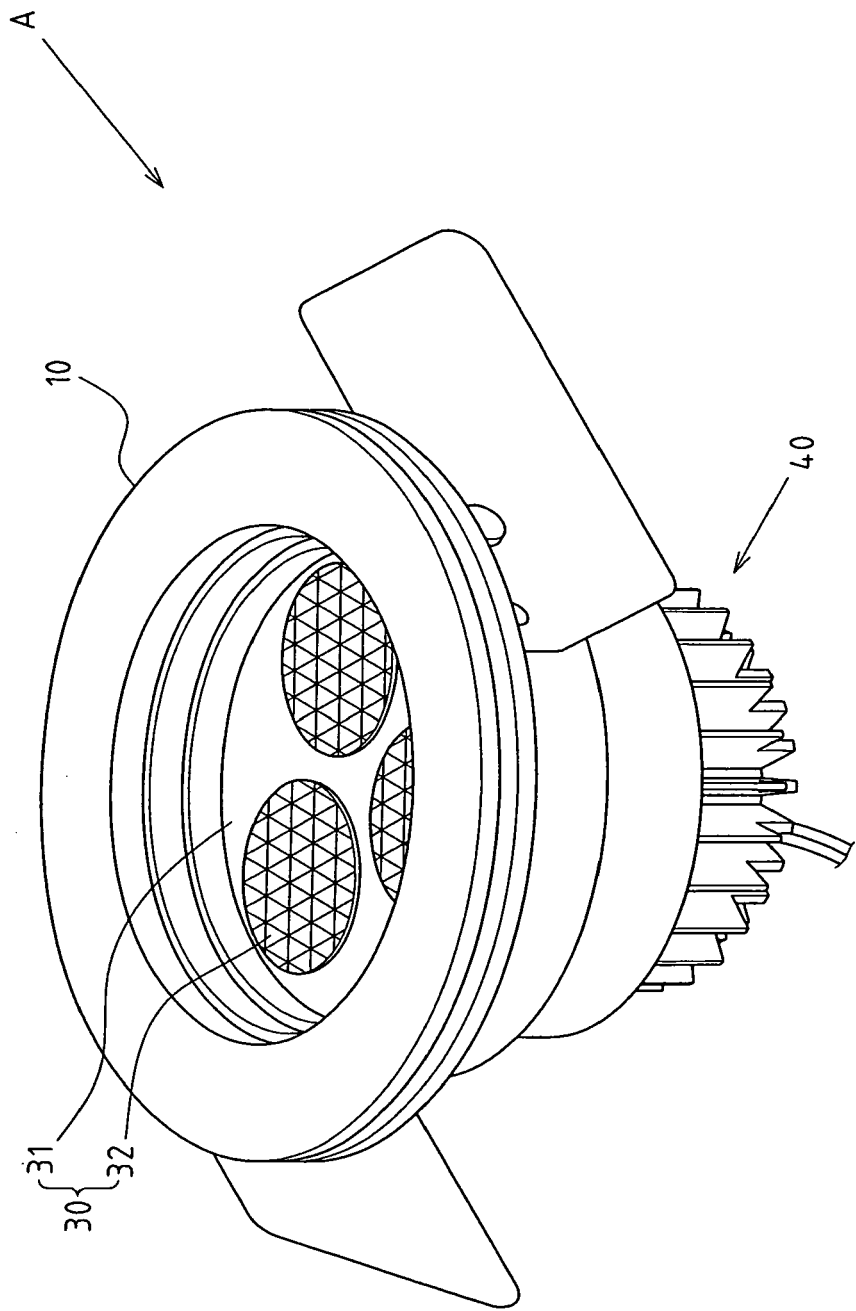


FIG.1

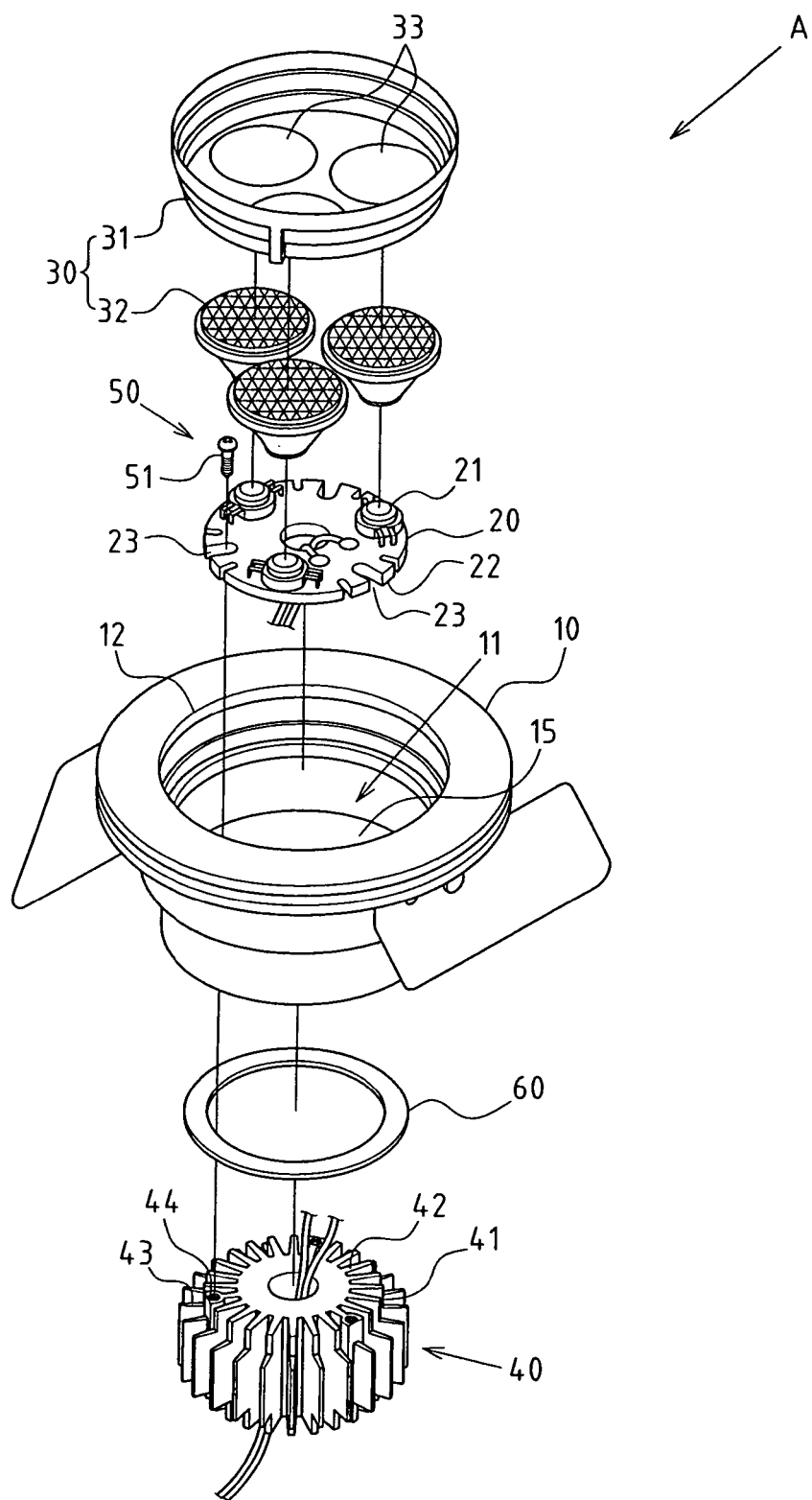


FIG.2

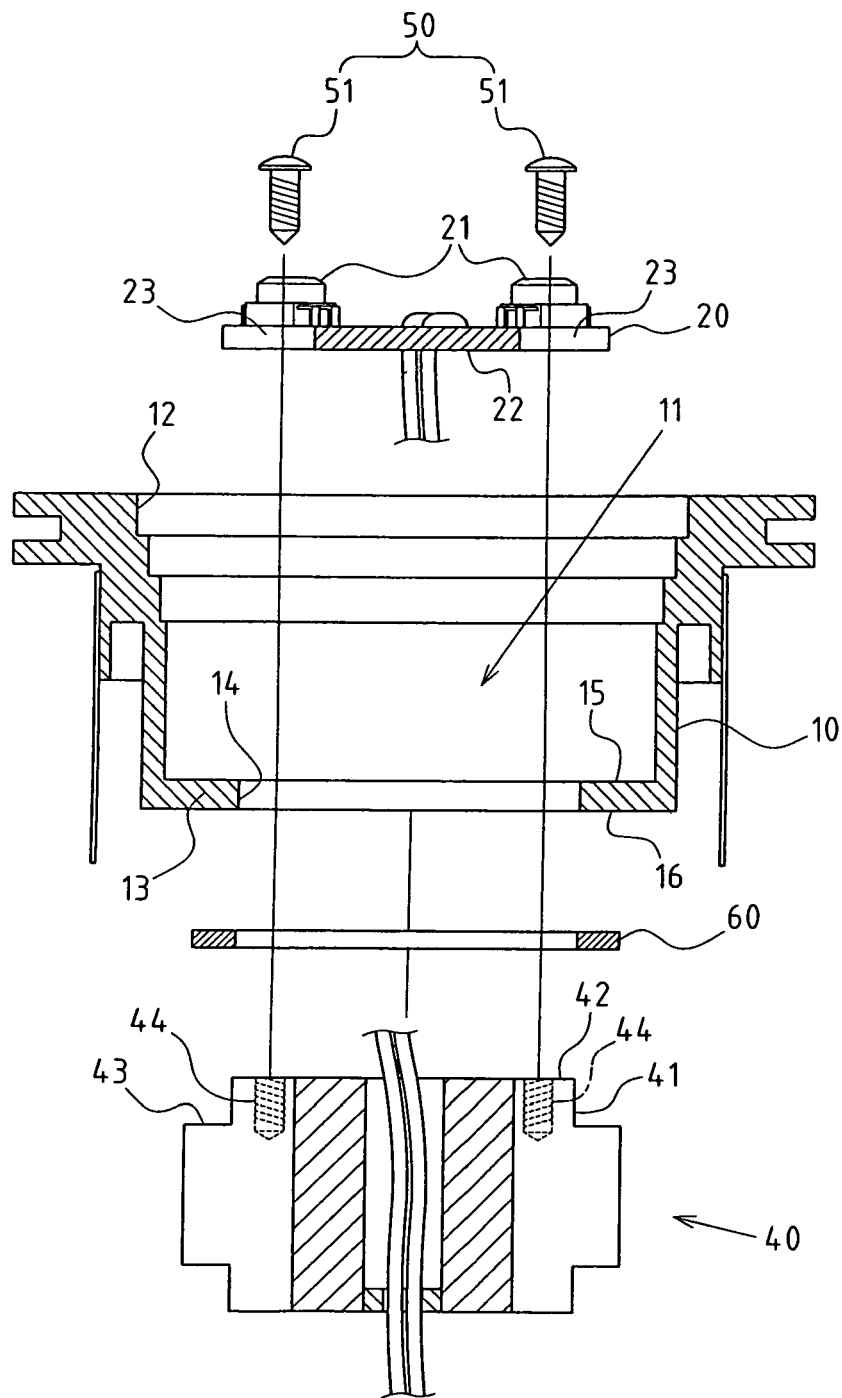


FIG.3

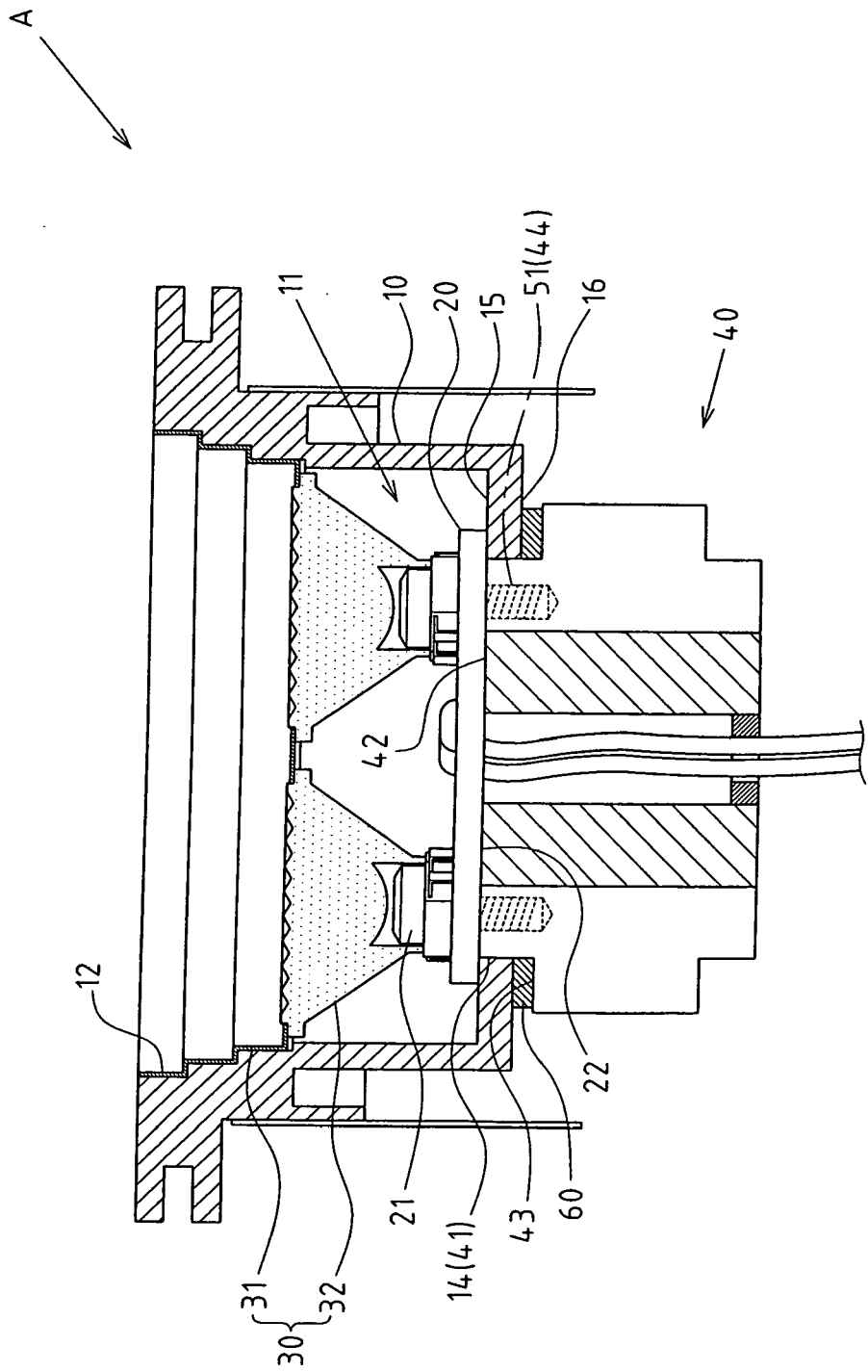


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 00 8954

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 705 421 A (NURIPLAN CO LTD [KR]) 27 September 2006 (2006-09-27) * paragraph [0015] - paragraph [0049] * * figures 2,4,5a *	1,4	INV. F21V29/00 ADD. F21Y101/02
A	DE 10 2006 017718 A1 (KROMBERG & SCHUBERT GMBH & CO [DE]) 16 May 2007 (2007-05-16) * paragraph [0021] - paragraph [0022] * * figure 9 *	1-4	
A	EP 1 577 613 A (CONRAD ELECTRONIC GMBH [DE]) 21 September 2005 (2005-09-21) * paragraph [0024] - paragraph [0035] * * figures 1,2 *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21V
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 August 2008	Examiner Blokland, Russell
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 00 8954

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-08-2008

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