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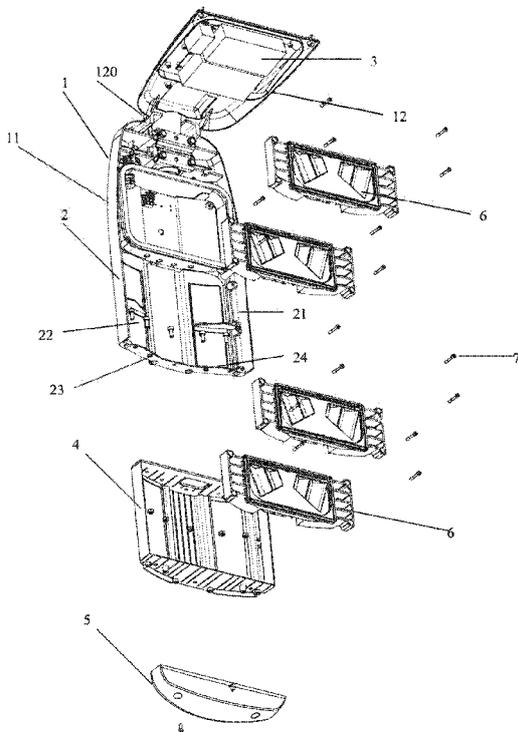


FIG.1

(57) Abstract: A modular illumination lamp comprises a base, wherein the lamp further comprises: a first frame integrally formed with the base; a second frame connected to the first frame or the base; at least one illumination module mounted on the first and second frames. By the specific design of the modular illumination lamp, the amount of the illumination modules can be increased or decreased as desired.

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## MODULAR ILLUSTRATION LAMP

### **Technical Field**

An embodiment of the present invention relates to a lamp, in particular, to a modular light-emitting diode (LED) lamp with the number of its modules being able to be increased or decreased as desired.

### **Background**

Currently, there has been a trend of using LED light sources to replace other kinds of light sources for energy saving. LED lamps are generally similar to traditional lamps in some aspects, and usually, the size of the LED lamp is fixed, and the power of the lamp can be adjusted by varying the amount of the LEDs. It is uneconomical to use a large lamp housing where small power is required.

Currently available modular LED lamps usually each have a detachable frame mounted on the base of the lamp. Frames with different lengths may be selected in accordance with the amount of LED illumination modules needed. However, such a lamp with a detachable frame is generally less aesthetic in appearance than those with a frame integral with the lamp base, since the detachable frame is normally made by extrusion, and is of poor flexibility.

### **Summary**

The technical problem to be solved by the disclosed technology is to overcome the drawbacks in the related technical field that the frame and base of the lamp can hardly be integrally formed and the lamp has poor flexibility. Hence, an embodiment of the present invention discloses a new modular illumination lamp.

To solve the above problem, an embodiment of the present invention provides a modular illumination lamp comprises a base, wherein the lamp further comprises: a first frame integrally formed with the base; a second frame connected to the first frame or the base; at least one illumination module mounted on the first and second frames.

By the specific design of the first and second frames, the amount of the illumination modules can be increased or decreased as desired.

As the first frame is formed integrally with the base of the lamp, the technical solution of the embodiments of the present invention ensures an aesthetic appearance of the lamp in its normal use state and the flexibility of the product. The second frame may be added under special requirements to lengthen the lamp structure, so as to achieve a good effect in use.

#### **Brief Description of the Drawings**

The contents, advantages of the present invention would be more apparent with reference to the accompany drawings of the illustrative embodiments of the invention.

Fig.1 shows a structural exploded view of a modular illumination lamp of an embodiment of the invention;

Fig.2 shows a structural view of a telescopic extrusion member of the modular illumination lamp of the embodiment of the invention;

Fig.3 shows a structural exploded view of the telescopic extrusion member of the modular illumination lamp of embodiment of the invention;

Fig.4 shows a frame view of a telescopic lamp housing of the modular illumination

lamp of the embodiment of the invention;

Fig.5 shows an elevation view of a light source module of the modular illumination lamp of the embodiment of the invention;

Fig.6 shows an exploded view of the light source module of the modular illumination lamp of the embodiment of the invention;

Fig.7 shows an elevation assembly view of the light source module of the modular illumination lamp of the embodiment of the invention; and

Fig.8 shows an elevation assembly view of the light source module of the modular illumination lamp of the embodiment of the invention from another angle of view.

### **Detailed Description**

An embodiment of the invention is shown in Fig.1-8, wherein Fig.1 shows a structural exploded view of a modular LED lamp, and said lamp comprises a base 1, a first frame 2, a power source case 3, a second frame 4, an end cap 5, and LED light source module(s) 6.

The base 1 comprises an upper housing 11 and a lower housing 12. The power source 3 is mounted in a space formed between the upper and lower housings. The lower housing 12 comprises a pivot shaft 120 on its rear side, which is mounted within respective hole or holes (not shown) on the rear side of the upper housing, such that the lower housing 12 can be pivotally mounted on the upper housing 11, and are fixed together with the upper housing 11 by a fixing means on the front of the lower housing 12. The power source case 3 mounted within the space formed between the upper and lower housing performs a conversion from alternating current (AC) to direct current (DC), i.e., converts alternating electric current AC to direct current.

The front portion of the base 1 further comprises a first frame 2, which is formed integral with the base 1 by casting so as to meet different requirements of the users and the forming of the different appearance. The first frame 2 comprises a support rod extending forwardly from the base 1, a cross beam 24, and a space 22 running through in the up-down direction. The support bar 21 and the cross beam 24 are respectively provided with threaded holes 23. The inside of the first frame 1 forms a receiving space for receiving the LED light source module(s) 6. A bolt 7 mates with each of the threaded holes in the support bar 21, so as to fit the LED light source 6 onto the first frame 2.

The length of the first frame 2 can be adjusted as desired. The present embodiment shows an arrangement with two LED modules, which is the one of the familiar arrangements in use. A section of the first frame 2 can be removed away when only one LED module is mounted.

With Reference to Figs 2-4, the second frame 4 is mounted on a side of the first frame. The second frame 4 comprises the support bars 41, which are extrusion members or stamping members, extending along an axis direction of the lamp, and a top face thereof is connected to cross beams 42 and 45 by self tapping screws 7. The cross beams 42, 45 and the support bar 41, the top face 43 together form a though space 40. The amount of the mounted optical modules is changed with the requirement of the lamp power, and thus the lengths of the support bar 41 and the top face 43 are also changed.

With reference to Figs 5-6, the LED module 6 comprises a radiator, the center of which forms a receiving portion 67 inside, and is provided with a DC-DC circuit (not shown ) on its back. There is a circuit board 68 inside the receiving portion 67. A LED light source 63 is mounted on the circuit board 68. Heat dispersion ridges 61 extend from the back of the receiving portion 67 to the two sides of the receiving portion, and

extend from the radiator vertically and upwardly. Through holes 62 are formed between heat dispersion ridges 61 so as to facilitate the dispersion of heat. As shown in Figs 7 and 8, when the LED module 6 are mounted on the first frame 2 and the second frame 4, at least a portion of the heat dispersion ridges 61 and the through holes 62 are disposed just below the through space 22 and 40, so as to facilitate the heat dispersion of the vertically extending heat dispersion ridges 61 and prevent accumulation of dirt and debris on the lamp.

A reflector 64 comprises two side portions 642 and a reflecting portion 641 connecting the two side portions 642 and forms a sector structure, and a receiving space is formed between the side portions 642 and reflector 641 and corresponds to the LED light sources 63. In the present embodiment, each LED module 6 comprises three reflectors 64, each corresponding to the LED light source 63 on the circuit board 68 respectively. When the LED module 6 is mounted on the circuit board 68, the LED light source 63 is located in the receiving space 640. The light source 63 emits light onto the reflector 64, and the light reflected from the reflector 64 is emitted to outside through lens 65. There is also a portion of the light emitted directly to outside without being reflected. The present embodiment adapts specific design of a sector shape reflector 64 adjacent to each LED light source 63, so as to achieve good optical effect. A press plate 66 fixes the lens 65 and reflector 64 on the LED module 6.

An end cap 5 is mounted on a side of the second frame 4. The end cap 5 may also be directly mounted on a side of the first frame 2, as the fixation structure is common to both the second frame 4 and the first frame 2. Therefore, a complete lamp is constructed. That is to say, the end cap 5 may be connected to the first frame 2 or the base, and is the same with the fixation means on the second frame 4 in structure.

The lamp of the embodiment of the present invention may use an arrangement with a base and a first frame integral with the base instead of the arrangement with an end cap; the lamp further comprises a second frame mounted to be connected with the first

frame or the base.

As the first frame 2 is formed integral with the base 1 of the lamp, the embodiment of the present invention ensures an aesthetic appearance of the lamp in its normal use state and the flexibility of the product. The second frame may be added under special requirements to lengthen the lamp structure, so as to achieve a good effect in use.

What is claimed is:

1. A modular illumination lamp comprising:
  - a base,
  - a first frame integrally formed with the base;
  - a second frame connected to the first frame or the base; and
  - at least one illumination module mounted on the first and second frames.
  
2. The modular illumination lamp as claimed in Claim 1, wherein the base comprises at least a chamber, and at least a power source is mounted within the chamber.
  
3. The modular illumination lamp as claimed in Claim 2, wherein the first frame is formed to extend forwardly from the base.
  
4. The modular illumination lamp as claimed in Claim 1, wherein the lamp comprises an end cap, which can be connected to the first frame or the base, and comprises same structure with a fixation means on the second frame.
  
5. The modular illumination lamp as claimed in Claim 4, wherein the second frame comprises at least a support bar comprising an extrusion member extending along the axial direction of the lamp.
  
6. The modular illumination lamp as claimed in Claim 4, wherein the second frame comprises at least a support bar comprising a stamping member extending along the axial direction of the lamp.
  
7. The modular illumination lamp as claimed in Claim 5, wherein the second frame comprises a fixing sheet, so as to be further fixed with the first frame.

8. The modular illumination lamp as claimed in Claim 1, wherein the power source in the base comprises an AC-DC module, and a DC-DC module may be provided on the illumination module.

9. The modular illumination lamp as claimed in Claim 1, wherein the at least one illumination module is a light emitting diode (LED) illumination module, and the illumination module further comprises a plurality of heat dispersion fins, which are vertically arranged with intervals therebetween, the first and second frames are provided with through holes correspondingly, and the heat dispersion fins are disposed below the through holes, and communicate with the space above the lamp.

10. The modular illumination lamp as claimed in Claim 1, wherein the at least one illumination module is a LED illumination module, and comprises a plurality rows of LED light sources, and a sector reflector is disposed on a side of the rows of LED light sources.

11. The modular illumination lamp as claimed in Claim 1, wherein the sector reflector comprises two side portions and a reflecting portion connecting the two side portions and forms a sector structure, and a receiving space is formed between the two side portions and reflector, and the rows of LED light sources are disposed in said receiving space.

12. The modular illumination lamp as claimed in Claim 3, wherein the lamp comprises an end cap, which can be connected to the first frame or the base, and comprises same structure with a fixation means on the second frame.

13. The modular illumination lamp as claimed in Claim 12, wherein the second frame comprises at least a support bar comprising an extrusion member extending along the axial direction of the lamp.

14. The modular illumination lamp as claimed in Claim 12, wherein the second frame comprises at least a support bar comprising a stamping member extending along the axial direction of the lamp.

15. The modular illumination lamp as claimed in Claim 13, wherein the second frame comprises a fixing sheet, so as to be further fixed with the first frame.

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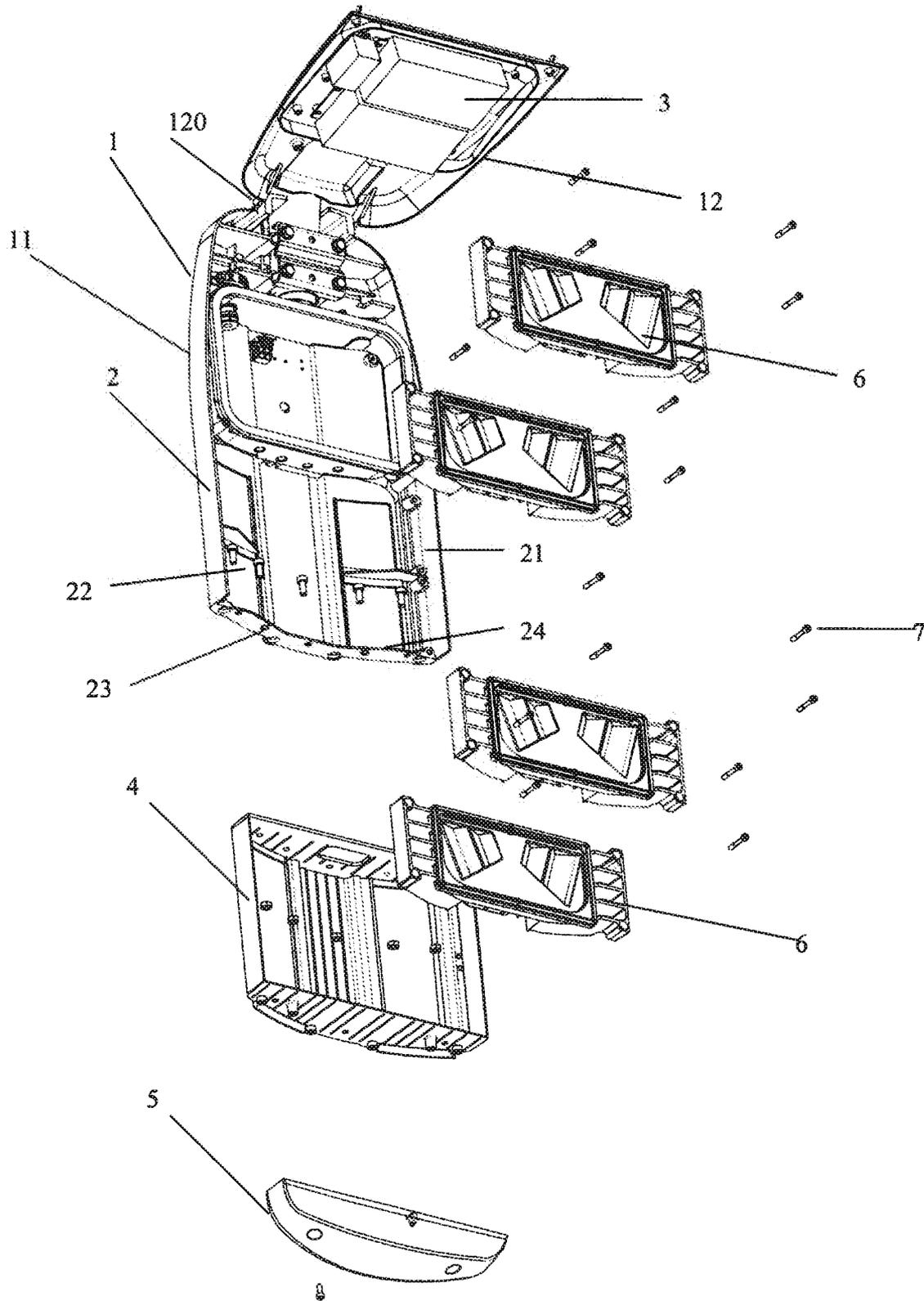


FIG.1

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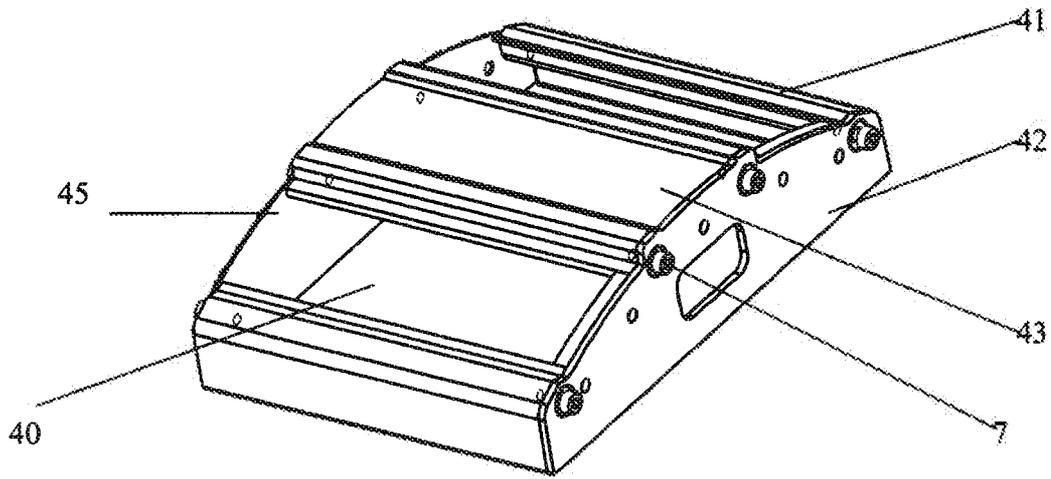


FIG. 2

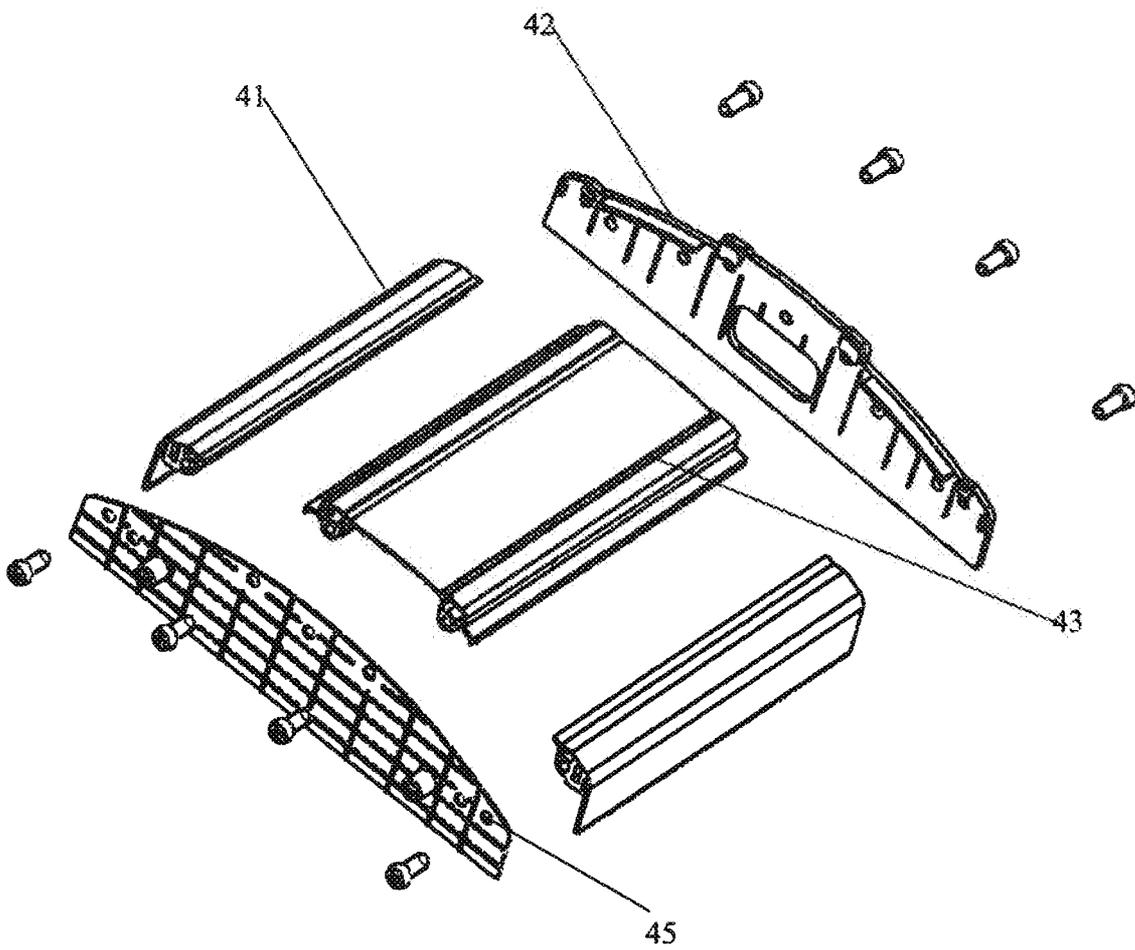


FIG. 3

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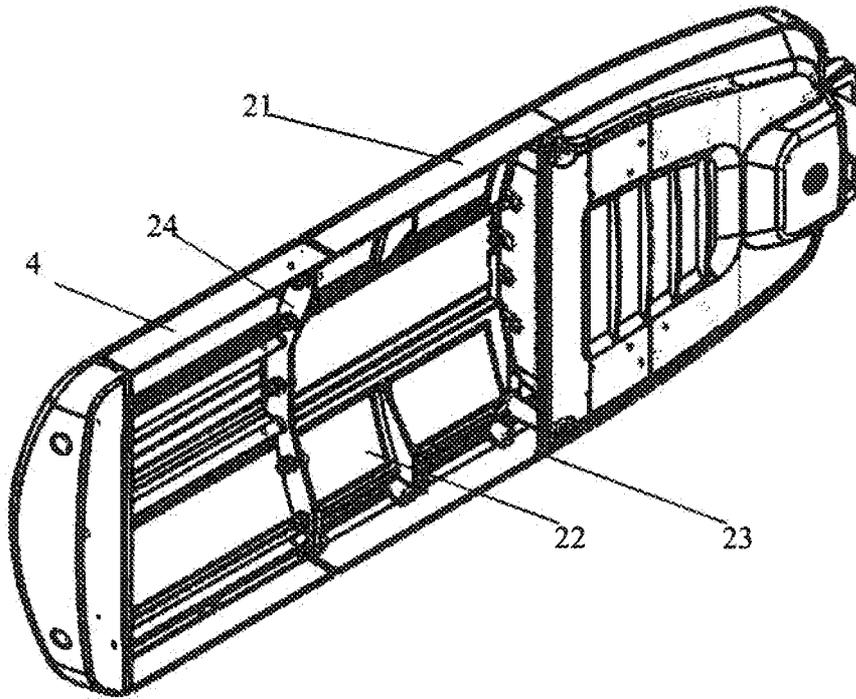


FIG. 4

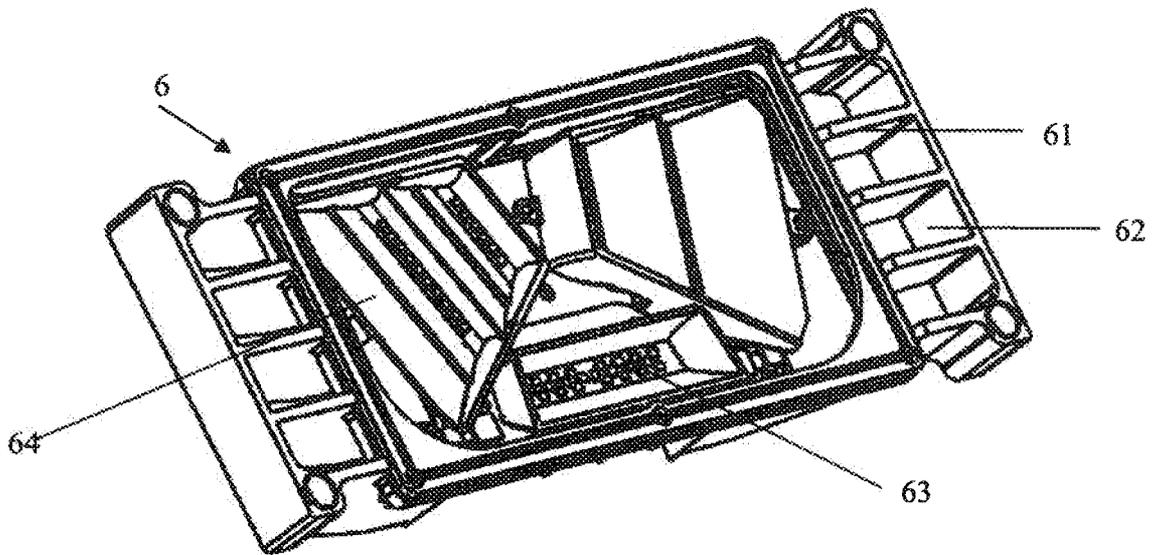


FIG. 5

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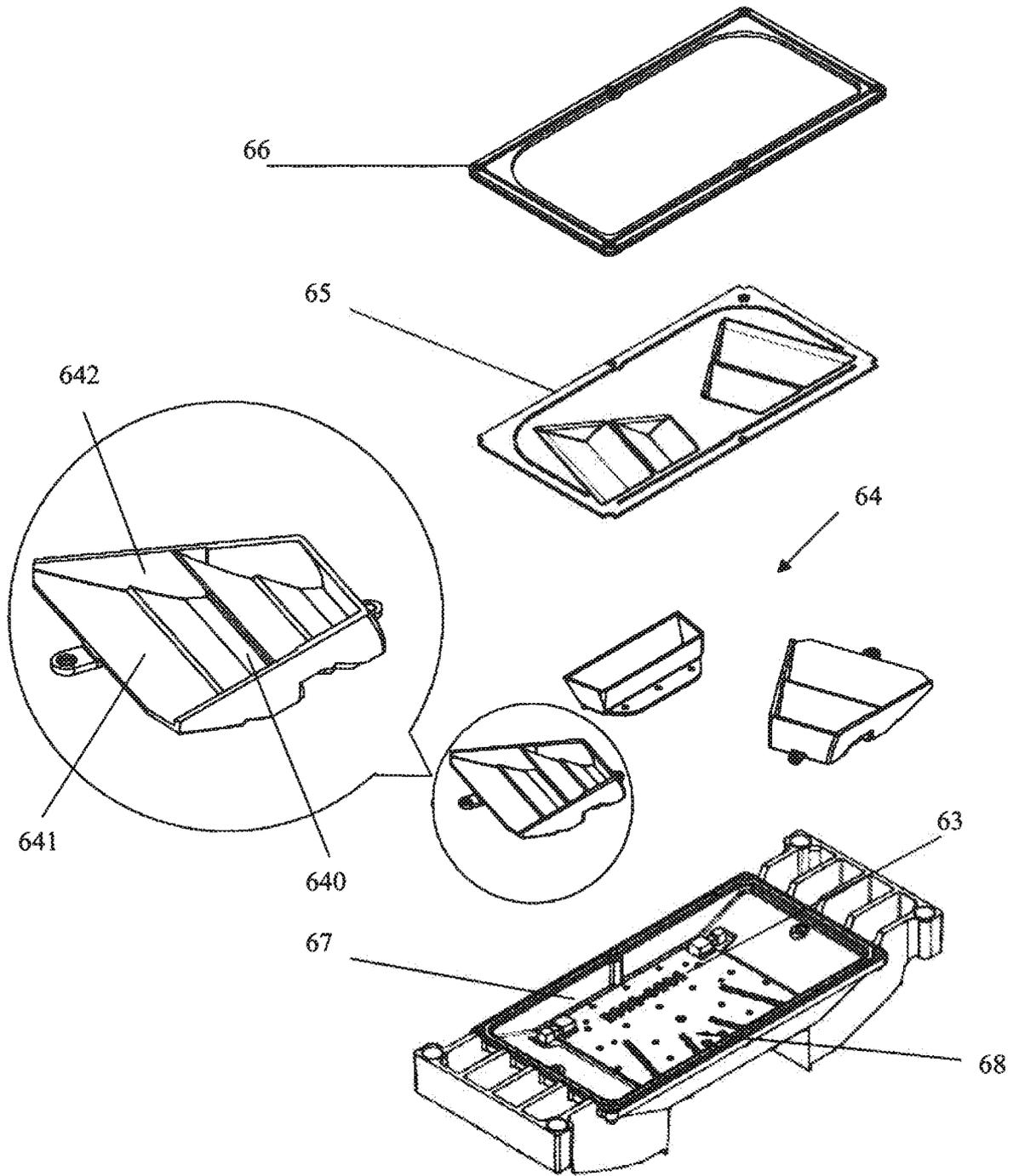


FIG.6

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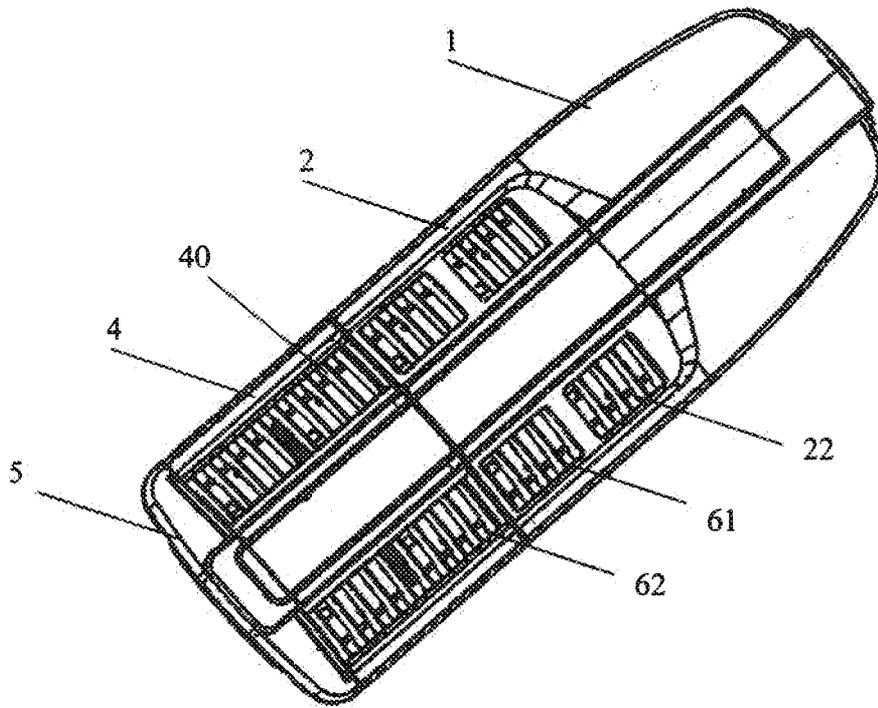


FIG. 7

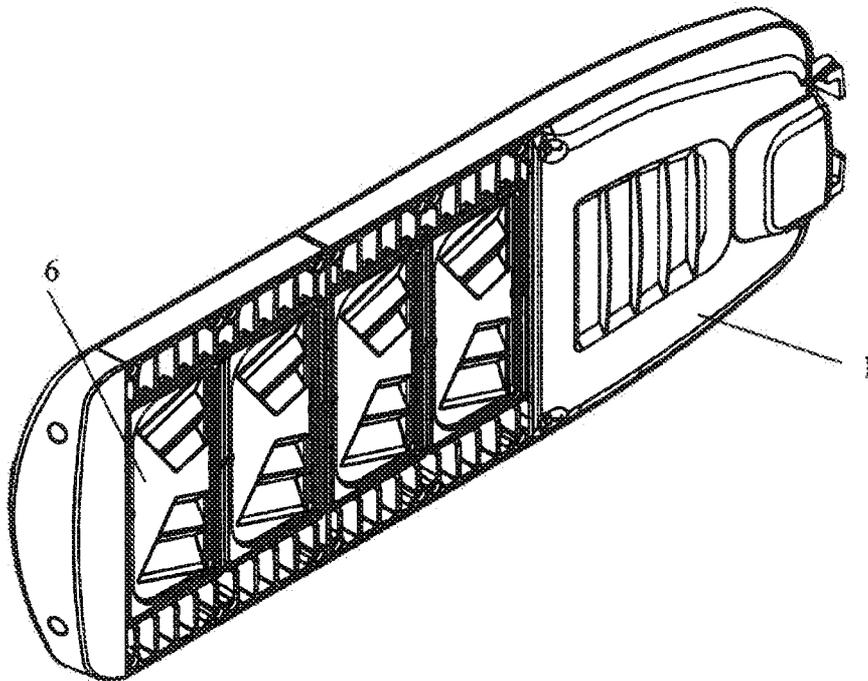


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No  
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A. CLASSIFICATION OF SUBJECT MATTER  
INV. F21W131/103 F21S8/08  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
F21S  
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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X,P	WO 2011/028773 A1 (BUDIKE LOTHAR E S [US]; BINA DAVE [US]) 10 March 2011 (2011-03-10) the whole document	1-15
X,P	KR 101 049 711 B1 (MSP CO LTD [KR]) 15 July 2011 (2011-07-15) abstract; figures	1-12
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Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

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Date of the actual completion of the international search  11 April 2012	Date of mailing of the international search report  19/04/2012
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Berthommé, Emmanuel
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## INTERNATIONAL SEARCH REPORT

International application No  
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