

Multiple Documents

Part	Description
1	5 pages
2	Exhibit EXHIBIT 1

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22 **IN THE UNITED STATES DISTRICT COURT
23 FOR THE NORTHERN DISTRICT OF CALIFORNIA**

24 HARVATEK CORPORATION

25 Plaintiff,

26 v.

27 CREE, INC., CREE HONG KONG
LIMITED and CREE SHANGHAI OPTO
DEVELOPMENT LIMITED,

Defendants.

Civil Action No. _____

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

1. Plaintiff Harvatek Corporation (“Harvatek” or “Plaintiff”), for its Complaint against Defendant Cree, Inc., Cree Hong Kong Limited, and Cree Shanghai Opto Development Limited (collectively referred to as “Defendants”), alleges the following:

1 **NATURE OF THE ACTION**

2 2. This is an action for patent infringement arising under the Patent Laws of the United
3 States, 35 U.S.C. § 1 *et seq.*

4 **THE PARTIES**

5 3. Plaintiff Harvatek is a company is organized under the laws of Taiwan and its
6 principal place of business is No. 18, Lane 522, Sec. 5, Chung Hwa Road, Hsinchu City 30094,
7 Taiwan (R.O.C.). A Harvatek affiliate, Inolux Corporation, d/b/a Harvatek Technologies,
8 maintains a place of business at 3350 Scott Blvd. Bldg. 41-01, Santa Clara, CA 95054.

9 4. Upon information and belief, Defendant Cree, Inc. is a corporation organized and
10 existing under the laws of North Carolina, with a place of business at 340 Storke Road, Goleta,
11 CA 93117 and a place of business at 4600 Silicon Drive, Durham, North Carolina 27703 U.S.A.
12 Upon information and belief, Defendant sells and offers to sell products and services throughout
13 the United States, including in this judicial district, and introduces products and services that
14 perform infringing processes into the stream of commerce knowing that they would be sold in
15 this judicial district and elsewhere in the United States.

16 5. Upon information and belief, Cree Hong Kong Limited is a corporation organized
17 and existing under the laws of Hong Kong, with a place of business at 12F, No.657, Bannan
18 Road, Zhonghe District, New Taipei City, Taiwan (R.O.C.) 235 and a place of business at 6th-
19 8th Floor, Green 18, 18 Science Park East Avenue, Hong Kong Science Park, Shatin, New
20 Territories, Hong Kong. Upon information and belief, Defendant sells and offers to sell products
21 and services throughout the United States, including in this judicial district, and introduces
22 products and services that perform infringing processes into the stream of commerce knowing
23 that they would be sold in this judicial district and elsewhere in the United States.

24 6. Upon information and belief, Cree Shanghai Opto Development Limited is a
25 corporation organized and existing under the laws of People's Republic of China, with a place of
26 business at 16/F, Block 1, Universal Hi-Tech Plaza No. 958 Zhenbei Road, Shanghai, 200333
27 and a place of business at Unit 2.3.4, 7/F, Huanggang Commercial Center No. 2028 Jintian

1 Road, Futian CBD, Shenzhen, 518033. Upon information and belief, Defendant sells and offers
2 to sell products and services throughout the United States, including in this judicial district, and
3 introduces products and services that perform infringing processes into the stream of commerce
4 knowing that they would be sold in this judicial district and elsewhere in the United States.

5 **JURISDICTION AND VENUE**

6 7. This is an action for patent infringement arising under the Patent Laws of the
7 United States, Title 35 of the United States Code.

8 8. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

9 9. Venue is proper in this judicial district under 28 U.S.C. §§ 1391(c) and 1400(b).

10 10. Upon information and belief, each Defendant conducts substantial business in this
11 forum, directly or through intermediaries, including: (i) at least a portion of the infringements
12 alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses
13 of conduct and/or deriving substantial revenue from goods and services provided to individuals
14 and business in California. Further, this Court has personal jurisdiction over Cree, Inc. because
15 it has purposely availed itself of the privileges and benefits of the laws of the State of California,
16 at least by maintaining a facility in Gotela, California.

17 **COUNT I – INFRINGEMENT OF U.S. PATENT NO. 8,079,737**

18 11. The allegations set forth in the foregoing paragraphs 1 through 10 are
19 incorporated into this First Claim for Relief.

20 12. On December 20, 2011, U.S. Patent No. 8,079,737 (“the ’737 patent”), entitled
21 “Reflection-Type Light-Emitting Module with High Heat-Dissipating and High Light-
22 Generating Efficiency,” was duly and legally issued by the United States Patent and Trademark
23 Office. A true and correct copy of the ’737 patent is attached as Exhibit 1.

24 13. Harvatek is the assignee and owner of all right, title and interest in and to the ’737
25 patent, including the right to assert all causes of action arising under said patent and the right to
26 any remedies for infringement of it.

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1 14. Upon information and belief, each Defendant has and continues to directly
2 infringe one or more claims of the '737 patent under 35 U.S.C. § 271, including at least claims 1,
3 2, 4, 5, 8, 9, 15, and 17, by making, using, selling, importing and/or providing and causing to be
4 used LED products such as the CREE LRP-28 series LED lamp.

5 15. Harvatek has been harmed by each Defendant's infringing activities.

6 **JURY DEMAND**

7 Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Harvatek demands a trial by
8 jury on all issues triable as such.

9 **PRAYER FOR RELIEF**

10 WHEREFORE, Plaintiff Harvatek demands judgment for itself and against Defendants as
11 follows:

12 A. An adjudication that each Defendant has infringed '737 patent;

13 B. An award of damages to be paid by Defendants adequate to compensate Harvatek
14 for each Defendant's past infringement of the '737 patent, and any continuing or future
15 infringement through the date such judgment is entered, including interest, costs, expenses and
16 an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

17 C. A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of
18 Plaintiff's reasonable attorneys' fees; and

19 D. An award to Harvatek of such further relief at law or in equity as the Court deems
20 just and proper.

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Dated: 12/5/2014

/s/ Seth W. Wiener

Seth W. Wiener

Attorneys for Plaintiff Harvatek Corp.

Exhibit 1



US008079737B2

(12) **United States Patent**
Wang et al.

(10) **Patent No.:** **US 8,079,737 B2**
 (45) **Date of Patent:** **Dec. 20, 2011**

(54) **REFLECTION-TYPE LIGHT-EMITTING MODULE WITH HIGH HEAT-DISSIPATING AND HIGH LIGHT-GENERATING EFFICIENCY**

(75) Inventors: **Bily Wang**, Hsinchu (TW); **Ping-Chou Yang**, Yonghe (TW); **Yu-Jen Cheng**, Tainan (TW)

(73) Assignee: **Harvatek Corporation**, Hsinchu (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 339 days.

(21) Appl. No.: **12/426,621**

(22) Filed: **Apr. 20, 2009**

(65) **Prior Publication Data**
 US 2010/0264797 A1 Oct. 21, 2010

(51) **Int. Cl.**
F21V 7/00 (2006.01)
 (52) **U.S. Cl.** **362/306**; 362/296.1; 362/310
 (58) **Field of Classification Search** 362/296.1, 362/306, 310

See application file for complete search history.

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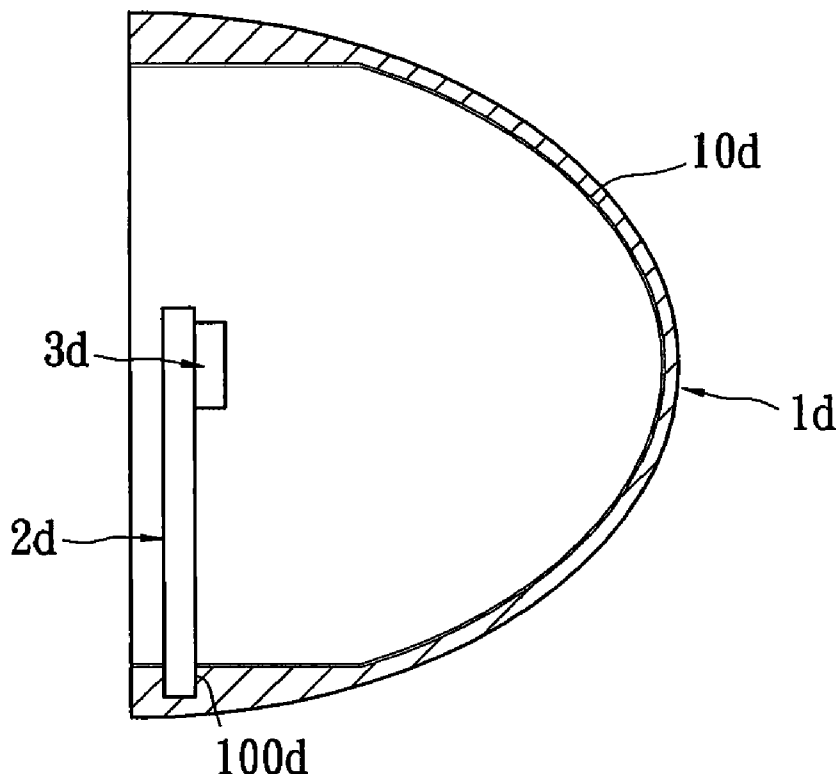
Primary Examiner — Laura Tso

(74) *Attorney, Agent, or Firm* — Muncy, Geissler, Olds & Lowe, PLLC

(57) **ABSTRACT**

A reflection-type light-emitting module with high heat-dissipating and high light-generating efficiency includes a reflection-type lampshade unit, a heat pipe unit and a light-emitting unit. The reflection-type lampshade unit has an open casing, a receiving space formed in the open casing, and a first reflective structure is disposed in the receiving space and on an inner surface of the open casing. The heat pipe unit is received in the receiving space and is disposed on the open casing. The light-emitting unit is disposed on the heat pipe unit, and the light-emitting unit has a light-emitting face facing the inner surface of the open casing.

17 Claims, 7 Drawing Sheets



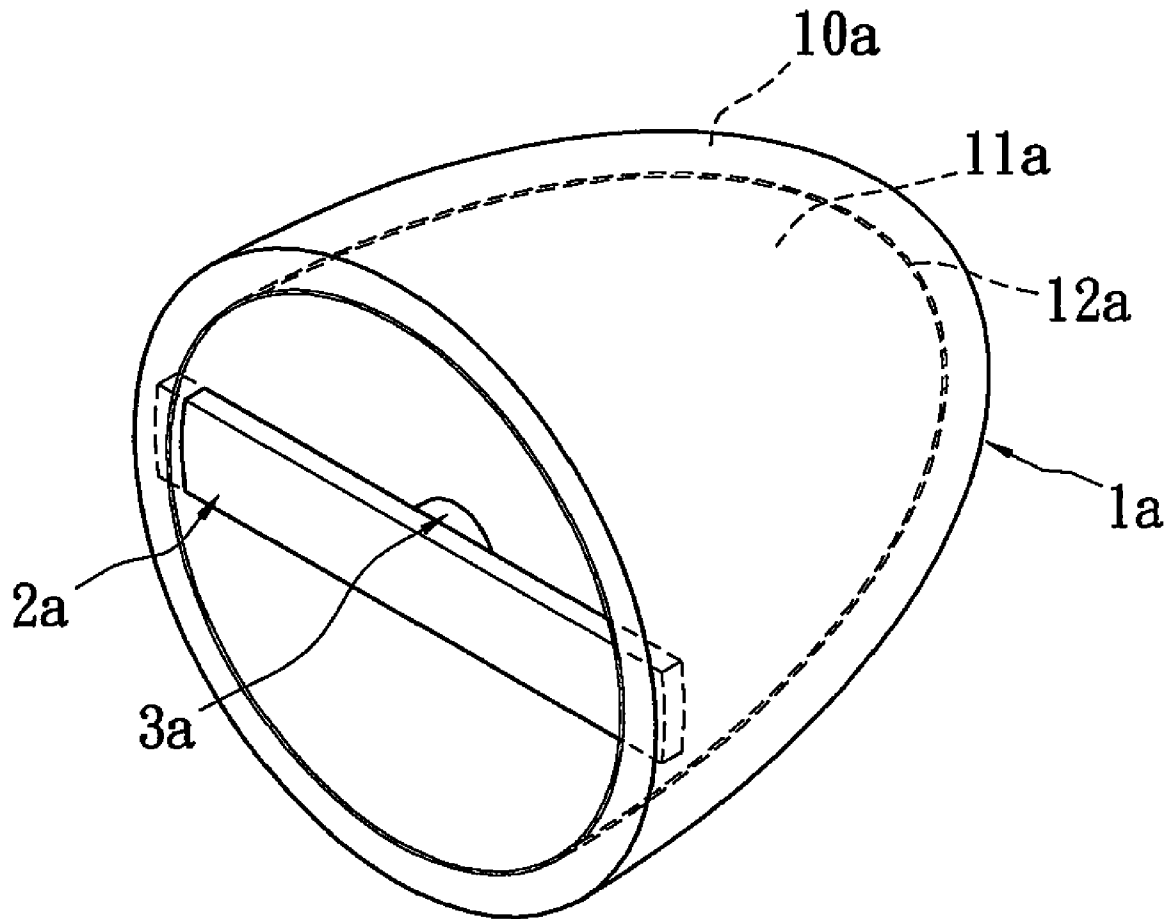


FIG. 1A

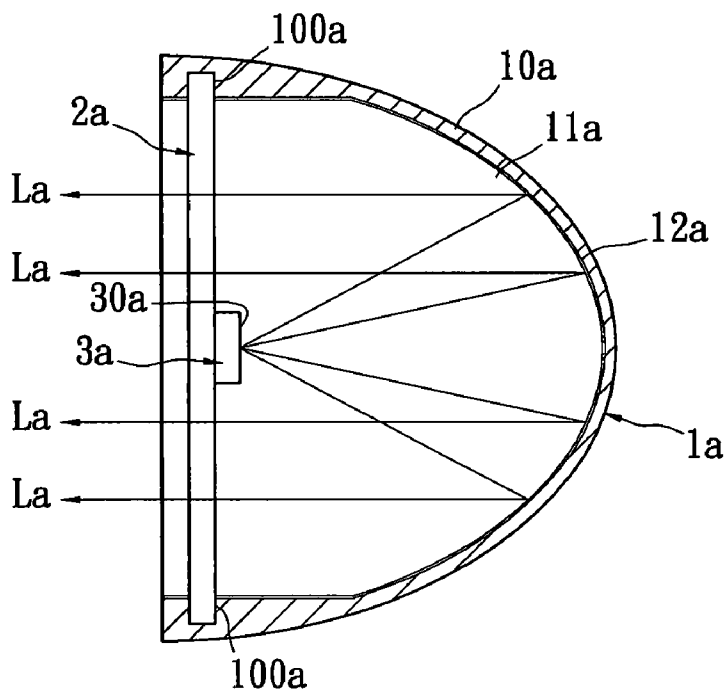


FIG. 1B

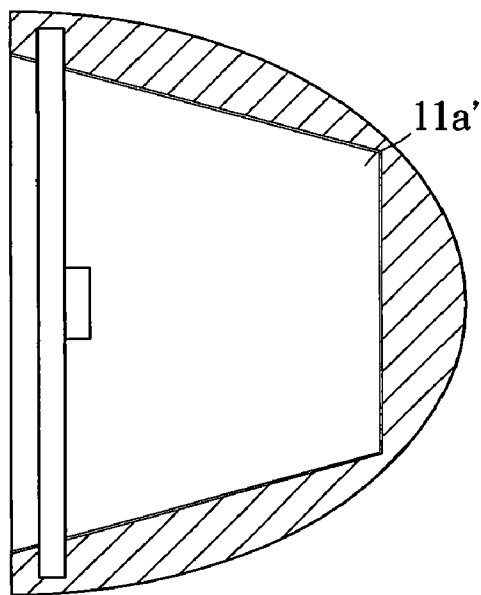


FIG. 1C

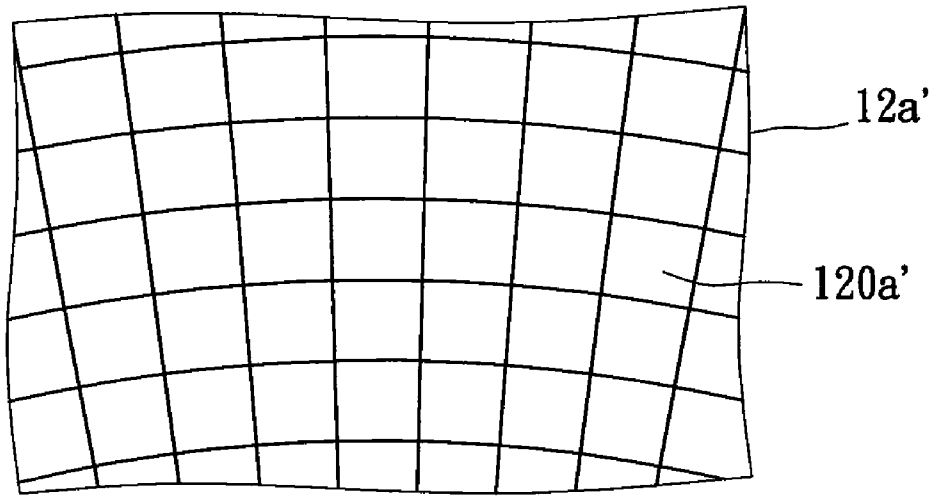


FIG. 1D

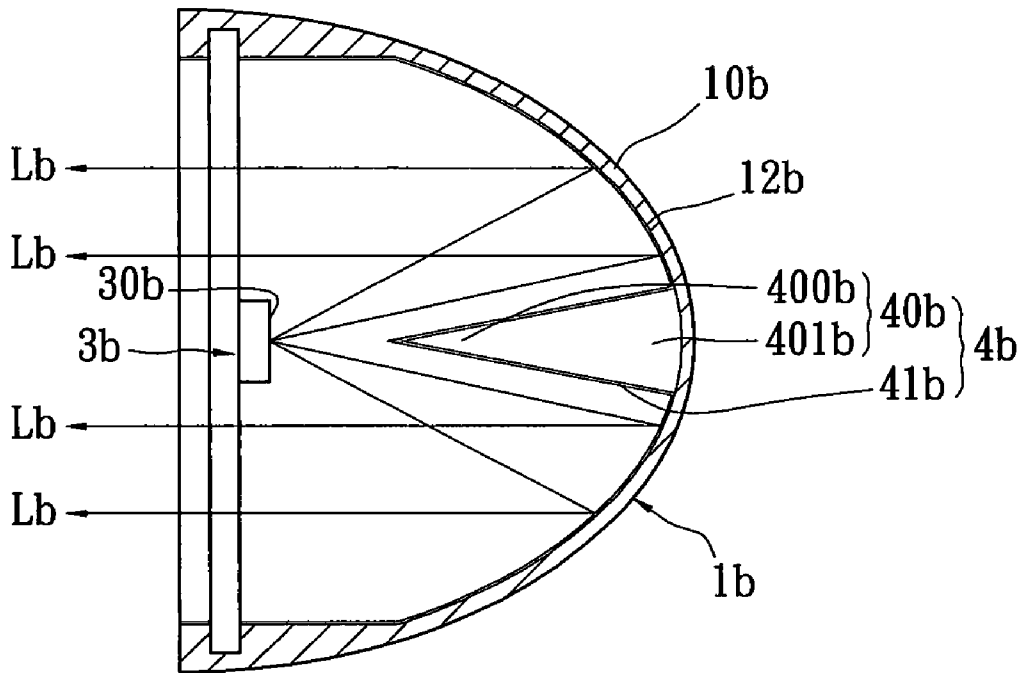


FIG. 2

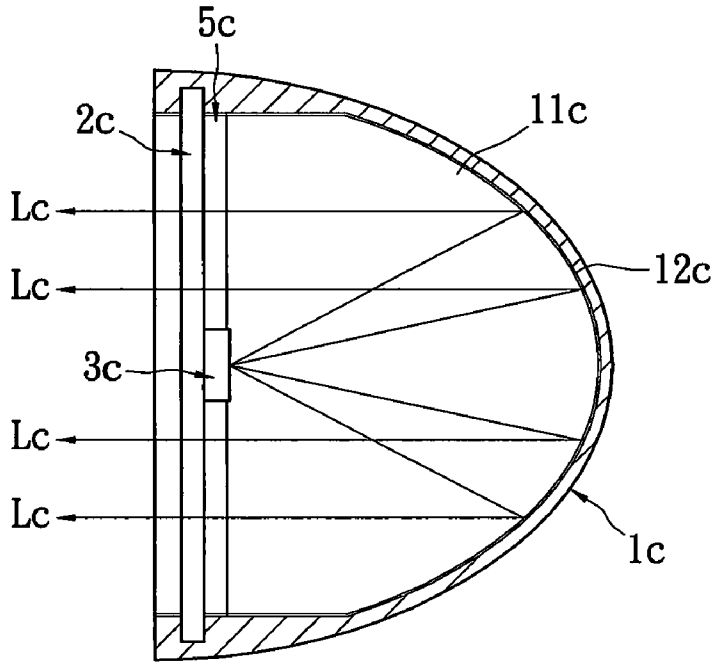


FIG. 3A

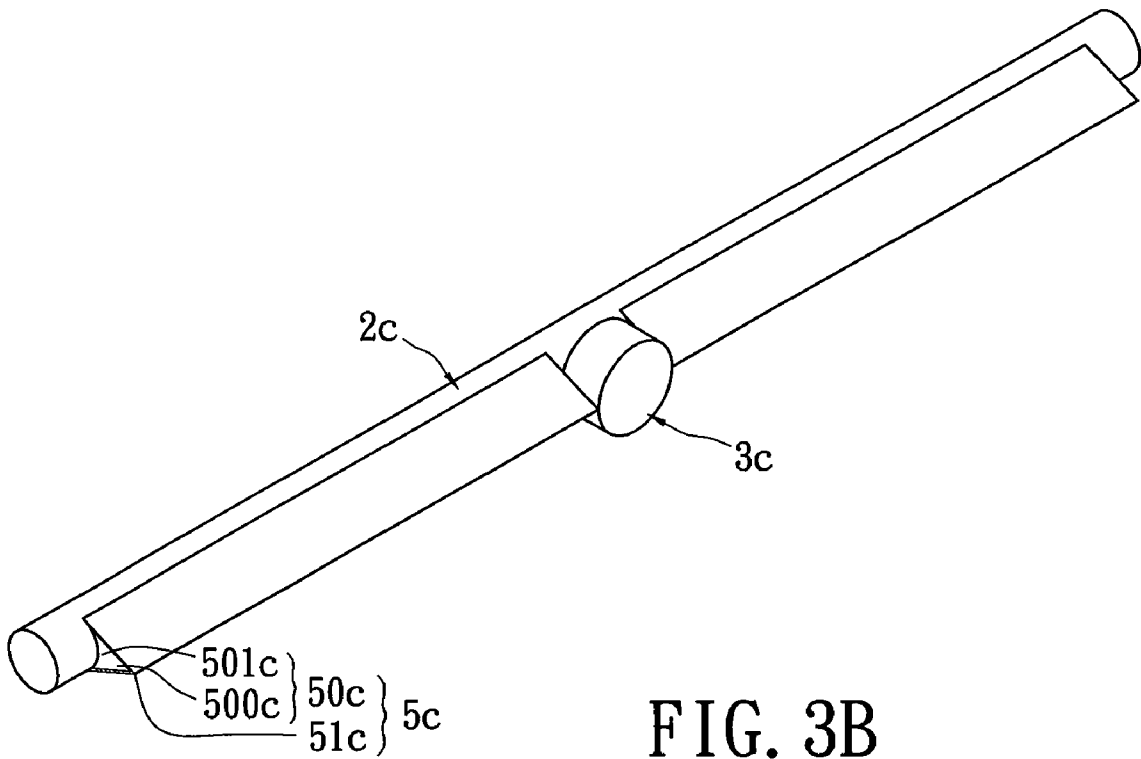


FIG. 3B

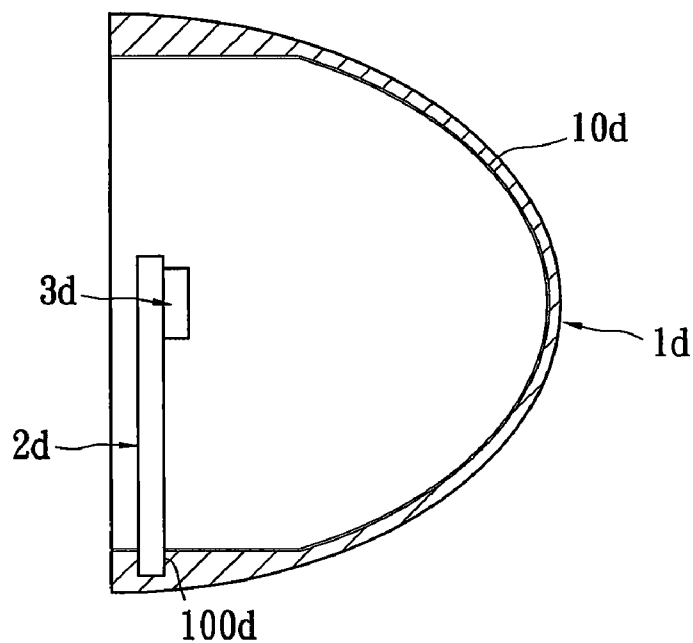


FIG. 4

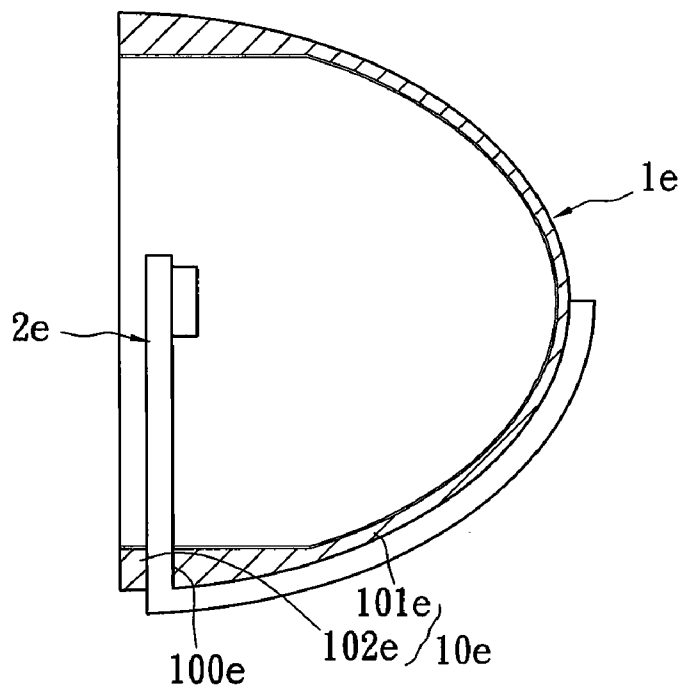


FIG. 5

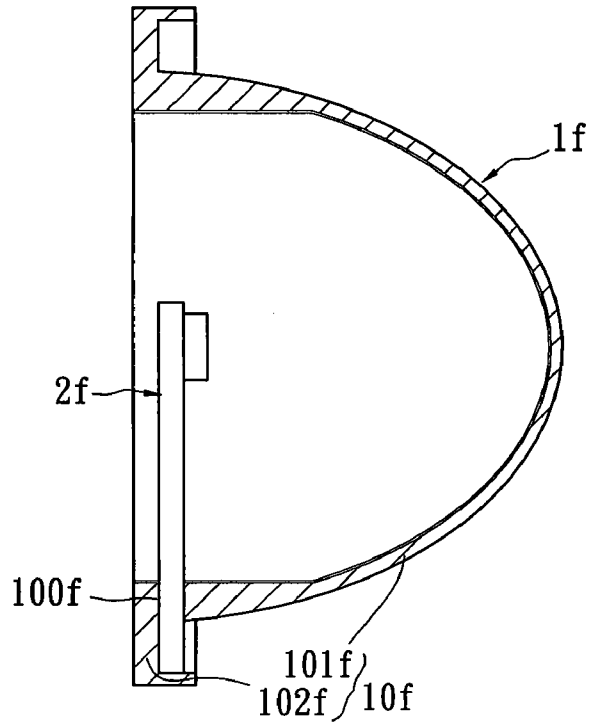


FIG. 6A

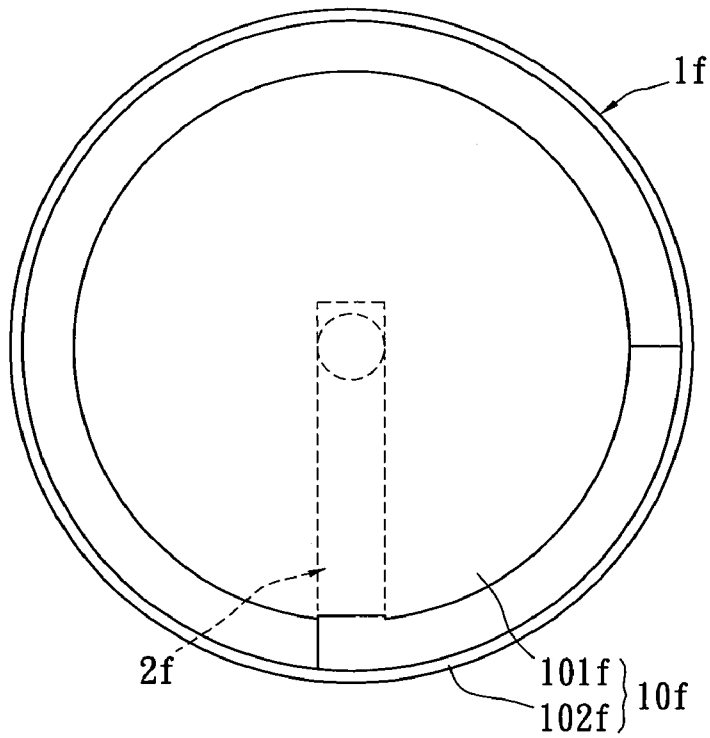


FIG. 6B

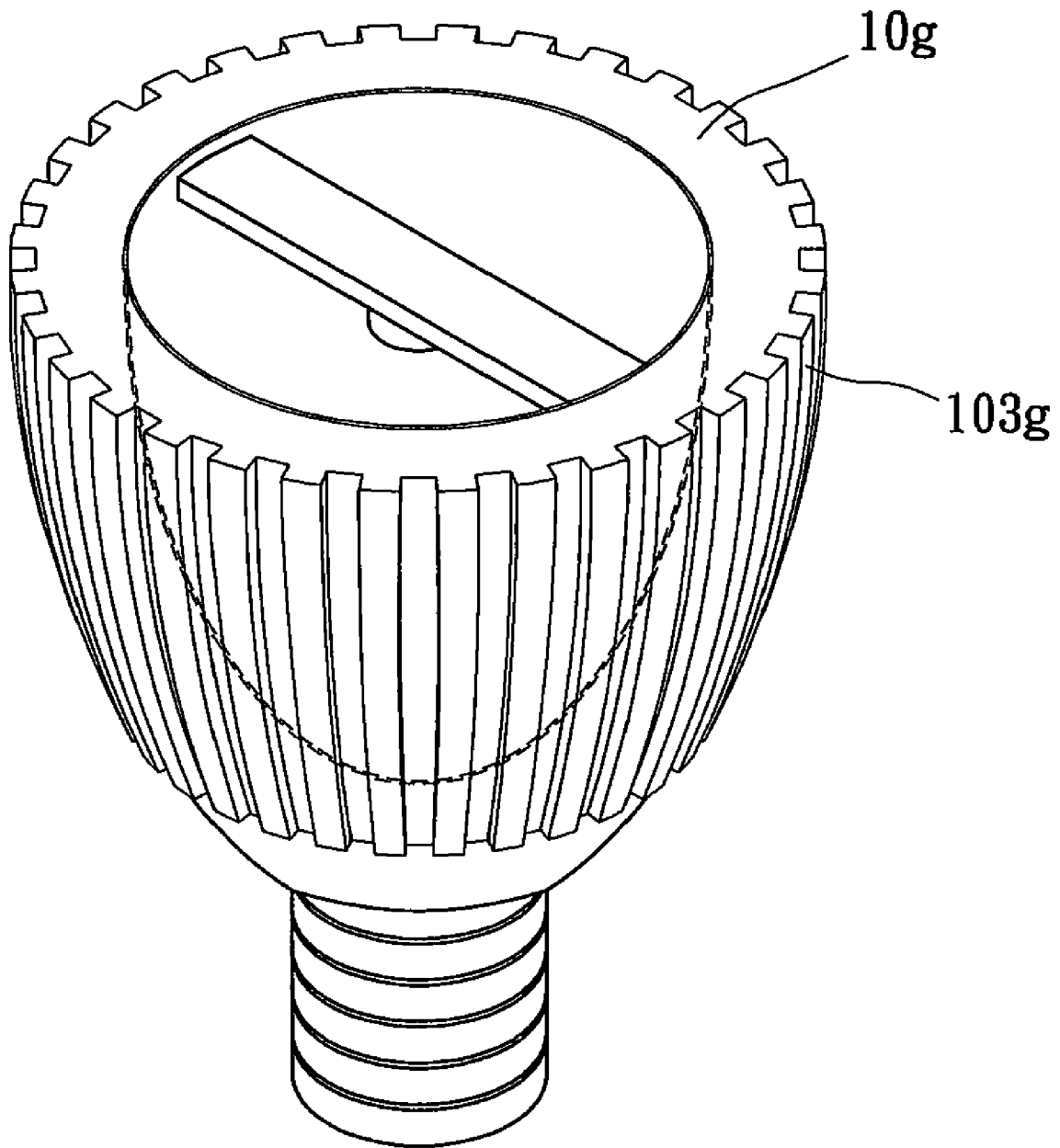


FIG. 7

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**REFLECTION-TYPE LIGHT-EMITTING
MODULE WITH HIGH HEAT-DISSIPATING
AND HIGH LIGHT-GENERATING
EFFICIENCY**

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a reflection-type light-emitting module, in particular, to a reflection-type light-emitting module with high heat-dissipating and high light-generating efficiency.

2. Description of Related Art

Before the invention of the light bulb, illuminating the world after the sun went down was a messy, arduous, hazardous task. It took a bunch of candles or torches to fully light up a good-sized room, and oil lamps, while fairly effective, tended to leave a residue of soot on anything in their general vicinity. With the invention of the light bulb and as the science of electricity progressed in the mid 1800s, the easy-to-use lighting technology was such an improvement over the old ways that the world never looked back.

Currently, the application of illuminating devices can be categorized into two fields. One such field is the construction industry, which includes all sorts of lighting systems adapted for private housing units, commercial buildings, and public transportation systems like highways and railways, and so on, so as to achieve objects of comfort, beautification, and safety. Another such field is commercial goods, which includes all sorts of light sources adapted for auto lamps, indoor lighting, and consumer electronics, etc. As in the year 2000, the largest demand for illuminating devices lays in the United State of America. Generally, the demand for illuminating devices is growing in a rapid path following the growth of global economy. Nevertheless, as environmental awareness also grows with the global economy, it is in great demand to have green lighting systems for enhancing environmental protection and energy conservation.

Hence, how to design a light-emitting module with high heat-dissipating and high light-generating efficiency is very important problem.

SUMMARY OF THE INVENTION

In view of the aforementioned issues, the present invention provides a reflection-type light-emitting module with high heat-dissipating and high light-generating efficiency. The present invention can generate high heat-dissipating efficiency (high heat-conducting efficiency) and high light-generating efficiency (high light utilization percent) by matching a heat pipe and a plurality of types of reflective structures.

To achieve the above-mentioned objectives, the present invention provides a reflection-type light-emitting module with high heat-dissipating and high light-generating efficiency, including: a reflection-type lampshade unit, a heat pipe unit, and a light-emitting unit. The reflection-type lampshade unit has an open casing, a receiving space formed in the open casing. A first reflective structure is disposed in the receiving space and on an inner surface of the open casing. The heat pipe unit is received in the receiving space and is disposed on the open casing. The light-emitting unit is disposed on the heat pipe unit, and the light-emitting unit has a light-emitting face facing the inner surface of the open casing.

Therefore, light beams generated by the light-emitting unit are reflected outside the reflection-type lampshade unit by using the first reflective structure, so that the present invention can generate high light-generating efficiency. Heat generated

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by the light-emitting unit can be transmitted to the reflection-type lampshade unit by using the heat pipe unit, so that the present invention can generate high heat-dissipating efficiency.

In order to further understand the techniques, means and effects the present invention provides for achieving the prescribed objectives, the following detailed descriptions and appended drawings are hereby referred, such that, through which, the purposes, features and aspects of the present invention can be thoroughly and concretely appreciated. However, the appended drawings are merely provided for reference and illustration, without any intention to be used for limiting the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a perspective, schematic view of the reflection-type light-emitting module according to the first embodiment of the present invention;

FIG. 1B is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module according to the first embodiment of the present invention;

FIG. 1C is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module using another type of receiving space according to the first embodiment of the present invention;

FIG. 1D is a partial, front, schematic view of the reflection-type light-emitting module using another type of first reflective structure according to the first embodiment of the present invention;

FIG. 2 is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module according to the second embodiment of the present invention;

FIG. 3A is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module according to the third embodiment of the present invention;

FIG. 3B is a perspective, schematic view of the third reflective structure mated with the heat pipe unit according to the third embodiment of the present invention;

FIG. 4 is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module according to the fourth embodiment of the present invention;

FIG. 5 is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module according to the fifth embodiment of the present invention;

FIG. 6A is a lateral, cross-sectional, schematic view of the reflection-type light-emitting module according to the sixth embodiment of the present invention;

FIG. 6B is a bottom, schematic view of the reflection-type light-emitting module according to the sixth embodiment of the present invention; and

FIG. 7 is a perspective, schematic view of the reflection-type light-emitting module according to the seventh embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED
EMBODIMENTS

Referring to FIGS. 1A and 1B, the first embodiment of the present invention provides a reflection-type light-emitting module with high heat-dissipating and high light-generating efficiency, including a reflection-type lampshade unit *1a*, a heat pipe unit *2a*, and a light-emitting unit *3a*.

The reflection-type lampshade unit *1a* has an open casing *10a*, a receiving space *11a* formed in the open casing *10a*, and a first reflective structure *12a* disposed in the receiving space *11a* and on an inner surface of the open casing *10a*. In addi-

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tion, in the first embodiment, the open casing **10a** has a cup shape with an opening, and the inner surface of the open casing **10a** can be a cambered surface. Moreover, the first reflective structure **12a** can be a first reflective layer that is made of reflective material, and the open casing **10a** has at least two retaining grooves **100a** formed on the inner surface thereof.

However, the shape of the open casing **10a** and the shape of the inner surface of the open casing **10a** are just examples, and it does not limit the present invention. For example, referring to FIG. 1C, the receiving space **11a'** has a trapezoid shape; referring to FIG. 1D, the first reflective structure **12A'** can be composed of a plurality of mirrors **120a'**, and the shape and the size of the mirror **120a'** can be adjusted according to different requirements.

Furthermore, the heat pipe unit **2a** can be a heat pipe. The heat pipe unit **2a** is received in the receiving space **11a** and disposed on the open casing **10a**, and two opposite ends of the heat pipe unit **2a** are respectively retained in the two retaining grooves **100a**.

Moreover, the light-emitting unit **3a** can be an LED. The light-emitting unit **3a** is disposed on the heat pipe unit **2a**, and the light-emitting unit **3a** has a light-emitting face **30a** facing the inner surface of the open casing **10a**. In other words, the light-emitting unit **3a** is disposed on a bottom face of the heat pipe unit **2a**, and the light-emitting face **30a** faces the first reflective structure **12a**. In addition, the light-emitting unit **3a** can obtain power by an electric wire along the heat pipe unit **2a**.

Hence, light beams **La** generated by the light-emitting unit **3a** are reflected outside the reflection-type lampshade unit **1a** by using the first reflective structure **12a**, so that the present invention can generate high light-generating efficiency. Heat generated by the light-emitting unit **3a** can be transmitted to the reflection-type lampshade unit **1a** by using the heat pipe unit **2a**, so that the present invention can generate high heat-dissipating efficiency.

Referring to FIG. 2, the difference between the second embodiment and the first embodiment is that the second embodiment further includes a second reflective structure **4b** disposed on the inner surface of the open casing **10b**. The second reflective structure **4b** has a cone **40b** and a second reflective layer **41b** formed on the surface of the cone **40b**. In addition, the cone **40b** is composed of a cone portion **400b** and a bottom portion **401b** disposed under the cone portion **400b**. The cone portion **400b** faces the light-emitting face **30b** of the light-emitting unit **3b**, and the bottom portion **401b** is disposed on the inner surface of the open casing **10b**.

Hence, light beams **Lb** generated by the light-emitting unit **3b** are effectively reflected outside the reflection-type lampshade unit **1b** by matching the first reflective structure **12b** and the second reflective structure **4b**, so that the light-generating efficiency of the second embodiment is better than that of the first embodiment. In addition, the shadow of the light-emitting unit **3b** on the inner surface of the open casing **10b** can be solved by using the second reflective structure **4b**. When the first reflective structure **12b** is formed on the entire inner surface of the open casing **10b**, the second reflective structure **4b** can be disposed on the first reflective structure **12b** directly.

Referring to FIGS. 3A and 3B, the difference between the third embodiment and above-mentioned embodiments is that the third embodiment further includes a third reflective structure **5c** disposed on the heat pipe unit **2c** that is received inside the receiving space **11c**. The third reflective structure **5c** has a cone **50c** and a third reflective layer **51c** formed on the surface of the cone **50c**. In addition, the cone **50c** is composed of a

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cone portion **500c** and a bottom portion **501c** disposed under the cone portion **500c**. The cone portion **500c** faces downwards the first reflective structure **12c**, and the bottom portion **501c** is disposed on a bottom side of the heat pipe unit **2c**. Hence, light beams **Lc** generated by the light-emitting unit **3c** are effectively reflected outside the reflection-type lampshade unit **1c** by matching the first reflective structure **12c** and the third reflective structure **5c**, so that the light-generating efficiency of the third embodiment is better than that of the first embodiment.

Furthermore, the first reflective structure, the second reflective structure, and the third reflective structure can be mated with each other in order to obtain better light-generating efficiency.

Referring to FIG. 4, the difference between the fourth embodiment and the first embodiment is that in the fourth embodiment, the open casing **10d** has at least one retaining groove **100d** formed on the inner surface thereof. One end of the heat pipe unit **2d** is retained in the retaining groove **100d**, and another end of the heat pipe unit **2d** is suspended. Hence, heat generated by the light-emitting unit **3d** can be effectively transmitted to the reflection-type lampshade unit **1d** by using the heat pipe unit **2d**, so that the present invention can generate high heat-dissipating efficiency.

Referring to FIG. 5, the difference between the fifth embodiment and the fourth embodiment is that in the fifth embodiment, the reflection-type lampshade unit **1e** has at least one through hole **100e** passing through the open casing **10e**. The heat pipe unit **2e** passes through the through hole **100e**, so that one part of the heat pipe unit **2e** is disposed on an outer surface of the open casing **10e**. In addition, the open casing **10e** has a casing portion **101e** and a base portion **102e** disposed under the casing portion **101e**, and the one part of the heat pipe unit **2e** is disposed on an outer surface of the casing portion **101e** of the open casing **10e**.

Referring to FIGS. 6A and 6B, in the sixth embodiment, the reflection-type lampshade unit **1f** has at least one through hole **100f** passing through the open casing **10f**. The heat pipe unit **2f** passes through the through hole **100f**, so that one part of the heat pipe unit **2f** is disposed on an outer surface of the open casing **10f**. The difference between the sixth embodiment and the fifth embodiment is that in the sixth embodiment, the open casing **10f** has a casing portion **101f** and a base portion **102f** disposed under the casing portion **101f**, and one part of the heat pipe unit **2f** is disposed on an outer surface of the base portion **102f** of the open casing **10f**.

Referring to FIG. 7, the difference between the seventh embodiment and above-mentioned embodiments is that the open casing **10g** has a heat-dissipating structure **103g** with heat-dissipating fins disposed on an outer surface thereof.

In conclusion, the present invention can generate high heat-dissipating efficiency (high heat-conducting efficiency) and high light-generating efficiency (high light utilization percent) by matching the heat pipe unit and a plurality of types of reflective structures (the first, second and third reflective structures).

The above-mentioned descriptions represent merely the preferred embodiment of the present invention, without any intention to limit the scope of the present invention thereto. Various equivalent changes, alternations or modifications based on the claims of present invention are all consequently viewed as being embraced by the scope of the present invention.

What is claimed is:

1. A reflection-type light-emitting module, comprising: a reflection-type lampshade unit having an open casing, a receiving space formed in the open casing, and a first

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reflective structure disposed in the receiving space and on an inner surface of the open casing, wherein the inner surface of the open casing is a cambered surface; a heat pipe unit received in the receiving space and disposed on the open casing; and a light-emitting unit disposed on the heat pipe unit, wherein the light-emitting unit has a light-emitting face facing the inner surface of the open casing.

2. The reflection-type light-emitting module according to claim 1, wherein the open casing has a cup shape with an opening.

3. The reflection-type light-emitting module according to claim 1, wherein the receiving space has a trapezoid.

4. The reflection-type light-emitting module according to claim 1, wherein the first reflective structure is a first reflective layer that is made of reflective material.

5. The reflection-type light-emitting module according to claim 1, wherein the first reflective structure is composed of a plurality of mirrors.

6. The reflection-type light-emitting module according to claim 1, wherein the open casing has at least two retaining grooves formed on the inner surface thereof, and two opposite ends of the heat pipe unit are respectively retained in the two retaining grooves.

7. The reflection-type light-emitting module according to claim 1, wherein the open casing has at least one retaining groove formed on the inner surface thereof, one end of the heat pipe unit is retained in the retaining groove, and another end of the heat pipe unit is suspended.

8. The reflection-type light-emitting module according to claim 1, wherein the reflection-type lampshade unit has at least one through hole passing through the open casing, and the heat pipe unit passes through the through hole, so that one part of the heat pipe unit is disposed on an outer surface of the open casing.

9. The reflection-type light-emitting module according to claim 8, wherein the open casing has a casing portion and a base portion disposed under the casing portion, and the one part of the heat pipe unit is disposed on an outer surface of the casing portion of the open casing.

10. The reflection-type light-emitting module according to claim 8, wherein the open casing is composed of a casing portion and a base portion disposed under the casing portion, and the one part of the heat pipe unit is disposed on an outer surface of the base portion of the open casing.

11. The reflection-type light-emitting module according to claim 1, further comprising: a second reflective structure disposed on the inner surface of the open casing, wherein the second reflective structure has a cone and a second reflective layer formed on the surface of the cone.

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12. The reflection-type light-emitting module according to claim 11, wherein the cone is composed of a cone portion and a bottom portion under the cone portion, the cone portion faces the light-emitting unit, and the bottom portion is disposed on the inner surface of the open casing.

13. The reflection-type light-emitting module according to claim 1, further comprising: a third reflective structure disposed on the heat pipe unit, wherein the third reflective structure has a cone and a third reflective layer formed on the surface of the cone.

14. The reflection-type light-emitting module according to claim 13, wherein the cone is composed of a cone portion and a bottom portion under the cone portion, the cone portion faces downwards the first reflective structure, and the bottom portion is disposed on a bottom side of the heat pipe unit.

15. The reflection-type light-emitting module according to claim 1, wherein the open casing has a heat-dissipating structure with heat-dissipating fins disposed on an outer surface thereof.

16. A reflection-type light-emitting module, comprising: a reflection-type lampshade unit having an open casing, a receiving space formed in the open casing, and a first reflective structure disposed in the receiving space and on an inner surface of the open casing, wherein the open casing has at least one retaining groove formed on the inner surface thereof; a heat pipe unit received in the receiving space and disposed on the open casing, wherein one end of the heat pipe unit is retained in the retaining groove, and another end of the heat pipe unit is suspended; and a light-emitting unit disposed on the heat pipe unit, wherein the light-emitting unit has a light-emitting face facing the inner surface of the open casing.

17. A reflection-type light-emitting module, comprising: a reflection-type lampshade unit having an open casing, a receiving space formed in the open casing, and a first reflective structure disposed in the receiving space and on an inner surface of the open casing, wherein the reflection-type lampshade unit has at least one through hole passing through the open casing; a heat pipe unit received in the receiving space and disposed on the open casing, wherein the heat pipe unit passes through the through hole, thus one part of the heat pipe unit is disposed on an outer surface of the open casing; and a light-emitting unit disposed on the heat pipe unit, wherein the light-emitting unit has a light-emitting face facing the inner surface of the open casing.

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