(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 447 363 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
27.02.2019 Bulletin 2019/09

(21) Application number: **17778553.2**

(22) Date of filing: **20.02.2017**

(51) Int Cl.:
F21S 8/02 *(2006.01)* ***F21V 29/77*** *(2015.01)*
F21V 33/00 *(2006.01)* ***F21V 25/12*** *(2006.01)*
F21V 17/16 *(2006.01)* ***H04R 1/02*** *(2006.01)*

(86) International application number:
PCT/CN2017/074075

(87) International publication number:
WO 2017/173888 (12.10.2017 Gazette 2017/41)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **05.04.2016 CN 201620279899 U**

(71) Applicant: **Vertex Lighting And Electrical Co., Ltd.**
Foshan, Guangdong 528000 (CN)

(72) Inventor: **WU, Liangju**
Foshan
Guangdong 528000 (CN)

(74) Representative: **Casalonga**
Casalonga & Partners
Bayerstraße 71/73
80335 München (DE)

(54) **SPEAKER LAMP**

(57) A speaker lamp (1) comprises a speaker portion (10). The speaker portion (10) has a sounding portion (11), a resonating cover (12) and a sound collecting cover (13). The sounding portion (11) is disposed in the sound collecting cover (13), and divides, in a sealed manner, a space formed by the resonating cover (12) and the sound collecting cover (13) into a front sound chamber (100) and a rear sound chamber (200). The speaker lamp (1) also comprises a lamp body (20) having a base (21), a light emitting portion (22) and a lamp cover (23). The light emitting portion (22) is disposed in the base (21). The lamp cover (23) is disposed at the bottom of the base (21). The base (21) is disposed in the sound collecting cover (13). Sound produced by the sounding portion (11) penetrates the lamp body (20) and is externally transmitted. The speaker lamp (1) can produce both light and sound and achieves effective sound reproduction.

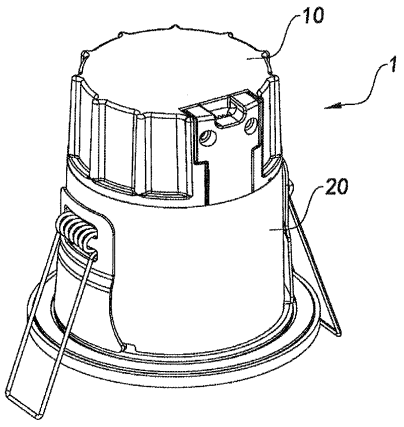

Fig.1A

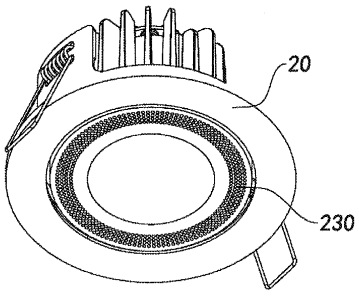

Fig.1B

EP 3 447 363 A1

Description

BACKGROUND OF THE PRESENT INVENTION

FIELD OF INVENTION

[0001] The present invention relates to a lamp, and more particularly to a speaker lamp.

DESCRIPTION OF RELATED ARTS

[0002] Embedded lamps have been widely utilized in most households nowadays because embedded lamps can be directly mounted and embedded into the ceiling for illumination purposes. Such installing style occupies less space in the room and is more artistic, especially for the renovation of lower clearance rooms. In addition, features of embedded lamp include higher luminous efficiency, lower power consumption, easier maintenance, and etc. Besides, with the improvement of people's life qualities, people's appreciations of music have increased as well. Therefore, they tend to set speakers in their active area for better sound effects. People may utilize speakers to provide greater sound effect. Sometimes, they also need speakers to serve in offices or meetings to enhance the sounds. Therefore, the functions of speaker are significant in family reunion, recreation, and etc.

[0003] Unfortunately, lamp and speaker are independent products in the market, so the consumers have to purchase them and install them separately. There is a great limitation comes from such separate installation because it not only increases the installation difficulty, but also strictly restricts the installation space. If there is a device being installed at an artistically improper position, it will affect the result of the entire renovation. Moreover, people can barely consider a layout of a room with both lamps and speakers mounted on the ceiling good-looking.

[0004] Also, there are currently lamps with speaker in the market (such as music bulb, music embedded lamp, music track lamp, and etc.). Nevertheless, the structures of these devices are unideal, which can easily render sound defects or distortions, usually including the following specific situations. First, the front sound chamber and rear sound chamber of the speaker part thereof are not separated in a sealed manner, rendering "sound short" and sound distortion. Second, the cavity portion (acoustical channel) between the speaker part and the sound bore is effectively isolated from the air of the external environment, rendering the sound and energy of the speaker being vainly dispersed to the external air rather than being sent out from the designated sound bore. Third, the speaker part does not have a resonator or vent tube, which hinders low frequency sound generated from being effectively sent out and influences the sound effect of the product.

SUMMARY OF THE PRESENT INVENTION

[0005] An object of the present invention is to provide a speaker lamp, wherein the speaker portion is arranged on the lamp body so as to form an integral structure, such that the lamp can have both the functions of speaker and lamp, so as to make the overall installation and use more easy and convenient.

[0006] An object of the present invention is to provide a speaker lamp, wherein the resonating cover and the sound collecting cover define and form a space therein, wherein the sounding portion is disposed in the resonating cover and divides, in a sealed manner, the space into a front sound chamber and a rear sound chamber, wherein the sounding element is detachably arranged in the rear sound chamber, while the lamp body is arranged in the front sound chamber, wherein the sound effect of the sounding element passes through the lamp body to be transmitted to the external environment.

[0007] An object of the present invention is to provide a speaker lamp, wherein the resonating cover is detachably arranged on the sound collecting cover through a connecting element, wherein the resonating cover is provided on an upper space of the sound collecting cover, such that the speaker lamp can be an integral structure, which is easy to install and use.

[0008] An object of the present invention is to provide a speaker lamp, wherein the sound collecting cover comprises a set of sealing elements, detachably arranged on the sound collecting cover, so as to reinforce the imperviousness of the sound collecting cover and enhance the sound effect of the speaker portion.

[0009] An object of the present invention is to provide a speaker lamp, wherein both the fin and end portion of the radiator of the lamp body have a predetermined curve. Namely, they are both in a curve structure, such that sound generated by the sounding element can pass through the radiator more smoothly, which helps to enhance the sound effect.

[0010] An object of the present invention is to provide a speaker lamp, wherein the lamp body comprises a fireproof element, arranged on the lamp body, so as to reinforce the fireproof quality of the lamp body.

[0011] An object of the present invention is to provide a speaker lamp, wherein the resonating cover comprises a pressure plate detachably arranged on the resonating cover, wherein the wire passes through the opening of the pressure plate, so as to allow the sounding element and the light emitting portion to be connected to external power source.

[0012] An object of the present invention is to provide a speaker lamp, wherein the sounding element is connected with the resonating cover through the second connector.

[0013] An object of the present invention is to provide a speaker lamp, which includes a remote control, such that the sounding state of the speaker portion of the speaker lamp can be controlled through the remote con-

trol, can which allows the sound intensity, audio mode, and etc. of the sounding element of the speaker portion to be conveniently adjusted by the user.

[0014] An object of the present invention is to provide a speaker lamp, which includes a remote control, such that the illumination state of the lamp body of the speaker lamp can be controlled through the remote control, which allows the luminous intensity, brightness of the light emitting portion, and etc. to be conveniently adjusted based on the user's needs.

[0015] An object of the present invention is to provide a speaker lamp, wherein the speaker portion comprises a data transmission terminal, which allows the speaker portion to be wirelessly connected with an audio transmission device that matches with the speaker portion therethrough, so as to enhance the usability of the speaker portion.

[0016] In order to achieve the above and other objects, the present invention provides a speaker lamp, which comprises a speaker portion and a lamp body. The speaker portion comprises a sounding portion, a resonating cover, and a sound collecting cover. The resonating cover and the sound collecting cover define a space therein. The sounding portion is disposed in the resonating cover and divides, in a sealed manner, the space into a front sound chamber and a rear sound chamber. The lamp body comprises a base, a light emitting portion disposed on the base, and a lamp cover arranged on the bottom of the base. The base is arranged in the sound collecting cover. Sound produced by the sounding portion passes through the lamp body to be transmitted to the external environment.

[0017] Preferably, the speaker portion comprises a connecting element, wherein the connecting element comprises a first connector, wherein the resonating cover is detachably arranged on the sound collecting cover through the first connector, wherein the resonating cover is provided on an upper space of the sound collecting cover.

[0018] Preferably, the connecting element further comprises a second connector, wherein the sounding portion is arranged on the resonating cover through the second connector.

[0019] Preferably, the base comprises an underframe and a set of attachment ends, wherein each the attachment end is extended outward from the underframe to form an L-shape with the underframe.

[0020] Preferably, the sound collecting cover comprises a set of openings provided thereon at the positions corresponding to the attachment ends respectively, wherein each of the attachment ends passes through the corresponded opening respectively.

[0021] Preferably, the sound collecting cover comprises a set of sealing elements, wherein the sealing elements are correspondingly arranged on the openings respectively, so as to enhance the imperviousness of the sound collecting cover.

[0022] Preferably, the light emitting portion comprises a lens and an illuminator arranged on the lens, wherein when the illuminator is in a working state, the lamp body will function to illuminate.

[0023] Preferably, the lamp body comprises a radiator, arranged on the illuminator, so as for dissipating heat generated by the illuminator.

[0024] Preferably, the radiator comprises at least a fin and a plurality of end portions arranged thereon, wherein both the fin and the end portions have a predetermined curve.

[0025] Preferably, the lamp body comprises a fireproof element, which further comprises a first fireproof element arranged on the lens and a second fireproof element arranged on the base.

[0026] Preferably, the lamp cover comprises a set of sound bores, evenly arranged on the lamp cover in predetermined angles.

[0027] Preferably, the sounding portion comprises a sounding element, wherein the sounding element comprises an information input terminal provided thereon for receiving wired or wireless audio signal.

[0028] Preferably, the speaker portion further comprises a remote control, wherein the remote control comprises a data transmission module deployed on the sounding portion and a control module respectively electrically connected with the sounding portion and the illuminator, wherein data transmission module is for receiving operation signal so as to control the working states of the sounding portion and the illuminator.

[0029] Preferably, the resonating cover comprises a wire hole arranged thereon and a wire, wherein the wire passes through the wire hole to be respectively electrically connected with the sounding portion and the illuminator, so as to allow the sounding portion and the illuminator to be connected to external power source.

[0030] Preferably, the resonating cover comprises a pressure plate, matchingly arranged on the resonating cover, so as to protect the wire passing through the wire hole and to enhance the imperviousness of the resonating cover.

[0031] Preferably, the sounding portion comprises a sounding element and a resonator, wherein the sounding element is arranged on the resonator, such that the low frequency part of the sound generated in its working state can be effectively transmitted and emitted, which broadens the sound range of the sounding element.

[0032] Preferably, the first connector is selected from the group consisting of adhesive, screw, and buckle.

[0033] Preferably, the second connector is a fastener

[0034] Still further objects and advantages will become apparent from a consideration of the ensuing description and drawings.

[0035] These and other objectives, features, and advantages of the present invention will become apparent from the following detailed description, the accompanying drawings, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036]

FIG. 1A is a perspective view of a preferred embodiment of the present invention.

FIG. 1B is a perspective view illustrating part of the above preferred embodiment of the present invention.

FIG. 2 is a sectional view of the above preferred embodiment of the present invention.

FIG. 3 is an exploded view of the above preferred embodiment of the present invention.

FIGs. 4A-4C illustrate installing modes of a sounding portion and a resonating cover according to the above preferred embodiment of the present invention.

FIGs. 5A-5C illustrate mounting positions of the sounding portion and the resonating cover according to the above preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0037] The following description is disclosed to enable any person skilled in the art to make and use the present invention. Preferred embodiments are provided in the following description only as examples and modifications will be apparent to those skilled in the art. The general principles defined in the following description would be applied to other embodiments, alternatives, modifications, equivalents, and applications without departing from the spirit and scope of the present invention.

[0038] Referring to Figs. 1-3, a speaker lamp of the present invention is a cylinder down lamp, so as to be embedded to install. The speaker lamp 1 comprises a speaker portion 10 and a lamp body 20. The speaker portion 10 is detachably arranged on the lamp body 20. It allows the user to integrally embed the speaker lamp 1 into a mounting surface like ceiling and etc. The speaker portion 10 is located in the upper space of the lamp body 20, such that when the speaker lamp 1 is mounted and embedded into the mounting surface, both the speaker portion 10 and the lamp body 20 are under the mounting surface, which can save installation space. The integral structure of the speaker portion 10 and the lamp body 20 of the speaker lamp 1 according to the present invention is not only easier for the installation, but also more artistic after installation comparing to conventional separated speaker and lamp. The speaker portion 10 is arranged in the upper space of the lamp body 20, such that when the speaker portion 10 is in a working state, it allows the sound generated to be transmitted to the external environment through the lamp body 20. The speaker lamp 1 can enhance the user experience and make the use of product more convenient and enjoyable for the user. The speaker portion 10 and the lamp body 20 are both designed to be detachable, which are easy to be replaced for the user. Once it is partially damaged during utilization, one may replace the damaged part that is needed to be replaced conveniently, rather than replace the entire of the speaker lamp 1. Hence, it lowers the cost of use thereof.

[0039] The speaker portion 10 comprises a sounding portion 11, a resonating cover 12, and a sound collecting cover 13. The sounding portion 11 is disposed in the resonating cover 12. The lamp body 20 is disposed in the sound collecting cover 13. The sounding portion 11 is divides, in a sealed manner, the space defined by the resonating cover 12 and the sound collecting cover 13 into the front sound chamber 100 and the rear sound chamber 200. The sounding portion 11 can generate sound in the front sound chamber 100 through vibrating in the front sound chamber 100. The sound will then be transmitted to the rear sound chamber 200 and be transmitted to the external environment through the lamp body 20 arranged in the rear sound chamber 200. It is worth mentioning that the sounding portion 11 has an information input terminal 110, which is able to receive audio signal for the sounding portion 11 to generate sound effect. The information input terminal 110 allows directly insert of USB flash disk, memory card, or other storage devices and is able to read the audio information in the storage device. It is worth mentioning that the sounding portion 11 comprises a sounding element 111 and a resonator 112. The sounding element 111 is arranged in the resonator 112. The resonator 112 is able to amplify the sound effect of the sounding element 111. Preferably, the sounding element 111 is a speaker, which can receive external audio signal and convert it into sound for transmission.

[0040] The resonating cover 12 is a lid-like structure having a wire hole 120 arranged thereon. The wire hole 120 is located on the top of a side of the resonating cover 12. The wire of the sounding portion 11 and the lamp body 20 can pass through the wire hole 120 to be connected to an external power source, so as to allow the speaker portion 10 and the lamp body 20 to be in regular working states. It is worth mentioning that when the wire is penetrated from the wire hole 120, the wire hole 120 can be sealed, so as to keep the imperviousness of the resonating cover 13 and enhance the sound effect of the speaker portion 10. The sealing process is commonly conducted through adhesive or gel dispensing, coating, potting, deploying silicone element at the wire hole 120, and etc.

[0041] It is worth mentioning that the resonating cover 12 further comprises a pressure plate 121, wherein the wire hole 120 is positioned in the concave area of the resonating cover 12 and the pressure plate 121 is able

to match the concave area of the resonating cover 12. When the pressure plate 121 is deployed in the resonating cover 12, it can hold the wire that passes through the wire hole 120, so as to prevent the wire from being damaged and enhance both the imperviousness of the resonating cover 12 and the sound effect of the speaker lamp 1.

[0042] The sound collecting cover 13 is a hollow cylinder structure. The lamp body 20 is detachably arranged in the sound collecting cover 13. Therefore, sound signal generated by the sounding portion 11 can be transmitted in the sound collecting cover 13.

[0043] It is worth mentioning that the speaker portion 10 further comprises a connecting element 14, wherein the sounding portion 11 is arranged in the resonating cover 12 through the connecting element 14. The sounding portion 11 and the resonating cover 12 are connected imperviously. In other words, the sounding portion 11 is disposed in the space defined by the resonating cover 12 and the sound collecting cover 13 through the connecting element 14. The sounding portion 11 is also divides, in a sealed manner, the space into the front sound chamber 100 and the rear sound chamber 200, so as to enhance the sound effect.

[0044] The connecting element 14 comprises a first connector 141 and a second connector 142. The resonating cover 11 is detachably arranged on the sound collecting cover 13 through the first connector 141. The sounding portion 11 is disposed in the resonating cover 12 through the second connector 142. The resonating cover 11 is a lid-shaped structure. The sounding portion 11 can be arranged on the front, back or side of the resonating cover 12 through the first connector 141. Different sounding portion 11 may be adaptable for different arranging direction on the resonating cover 12, so as to allow the speaker portion 10 to provide various sound effects. Preferably, referring to Figs. 4A-4C in order, the second connector 142 may be a connection means selected from the group consisting of buckle, screw, and adhesive, such that the sounding portion 11 can be arranged on the resonating cover 12 easily.

[0045] Referring to Figs. 5A-5C in order, the sounding portion 11 can be arranged in various directions on the front, back or side of the resonating cover 12, which allows the user to decide and utilize different installing modes based on the actual needs, while the sounding portion 11 provides the same sound effect in the resonating cover 12. It is worth mentioning that the front indicates that the sounding portion 11 being mounted in the resonating cover 12 and the resonating cover 12 is a lid structure, wherein the back refers to the top part of the resonating cover 12 that after the resonating cover is installed, the sounding portion 11 faces toward the outside.

[0046] Preferably, the first connector 141 is a buckle connecting element, so as to allow the resonating cover 12 to be detachably arranged on the sound collecting cover 13. The resonating cover 12 and the sound collecting cover 13 are detachably connected, so as to provide a better usability thereof. Once the resonating cover 12 or the sound collecting cover 13 is damaged during using, it only has to replace the damaged part rather than the entire device. Therefore, it not only lowers the maintenance costs for the user, but also facilitates the repairing job.

[0047] It is worth mentioning that the speaker portion 10 further comprises a remote control 15, arranged in the lamp body 20. The user can wirelessly control the working states of the speaker portion 10 and the lamp body 20 through the remote control 15. It includes controlling the volume and audio signal switching of the speaker portion 10, controlling the brightness of the lamp body 20, and etc. The wireless controlling technique includes utilizing wireless technology, such as Bluetooth, Wi-Fi, Red tooth, and etc., to control the speaker portion 10. The user may utilize a digital device, such as a cellphone, tablet, computer, and etc., to control the working state of the speaker lamp 1. The speaker lamp 1 may become smart, so as to enhance the user experience.

[0048] The remote control 15 comprises a data transmission module 151 and a control module 152. The data transmission module 151 is electrically connected with the control module 152. The data transmission module 151 is able to receive wireless transmission signals and transmit them to the control module 152. The control module 152 is electrically connected to the sounding portion 11 and the light emitting portion 22, so as to control the working states of the sounding portion 11 and the light emitting portion 12.

[0049] The lamp body 20 comprising a base 21, a light emitting portion 22 disposed on the base 21, and a lamp cover 23 arranged on the bottom surface of the base 21. Light emitted by the light emitting portion 22 is radiated through the lamp cover 23. The base 21 is arranged in the sound collecting cover 13, such that the lamp body 20 is arranged in the sound collecting cover 13 as well.

[0050] It is worth mentioning that the base 21 comprises an underframe 211 and a set of attachment ends 212. The base 211 is in a regular shape, which is preferably a circular structure. The attachment ends 212 are extended upward from the underframe 211 and in a certain predetermined length. The attachment ends 212 are respectively form an L-shape with the underframe. The speaker lamp 1 can be mounted and embedded into a mounting surface, such as ceiling and etc., through the attachment ends 212. The sound collecting cover 13 comprises a set of openings 130 provided thereon. The positions and shapes of the openings 130 are corresponding to the attachment ends 212 respectively. When the sound collecting cover 13 is arranged on the base 21, the attachment ends 212 can pass through the openings 130 respectively and be affixed on the mounting surface. The sound collecting cover 13 further comprises a set of sealing elements 131. The sealing elements 131 are correspondingly arranged on the openings 130, so as to enhance the imperviousness of the sound collecting

cover 13.

[0051] It is worth mentioning that the lamp cover 23 comprises a set of sound bores 230. The sound bore 230 can be in various shapes, such as circular, square, oval, and etc. Therefore, sound generated by the sounding portion 11 can be transmitted to the external environment through the sound bore 230.

[0052] The light emitting portion 22 comprises a lens 222 and an illuminator 221 arranged on the lens 222. The lens 222 can serve to condense the light, so as to make the light emitted by the illuminator 221 more even and uniform. When the illuminator 221 is in a working state, the lamp body 20 will also be in an illuminating state.

[0053] The lamp body 20 further comprises a fireproof element 24 arranged thereon, so as to reinforce the fireproof quality of the lamp body 20. In case of fire, the fireproof element 24 can serve to cut off the fire from passing through the opening of the speaker lamp 1 and spreading. It is worth mentioning that the fireproof element 24 comprises a first fireproof element 241 and a second fireproof element 242. The first fireproof element 241 is arranged on the illuminator 221. The second fireproof element 242 is arranged on the base 21. Both the first fireproof element 241 and the second fireproof element 242 can serve to cut off fire spread.

[0054] The lamp body 20 further comprises a radiator 25. The radiator 25 can effectively dissipate heat generated by the illuminator 221 in working state, so as to protect the illuminator 221. It is worth mentioning that the fin and the top of the radiator 25 respectively have a predetermined curve, which are respectively in a curve shape. Based on experiments and tests, the curve structure facilitates sound transmission and enhances the sounding effect of the speaker portion 10.

[0055] One skilled in the art will understand that the embodiment of the present invention as shown in the drawings and described above is exemplary only and not intended to be limiting. It will thus be seen that the objects of the present invention have been fully and effectively accomplished. The embodiments have been shown and described for the purposes of illustrating the functional and structural principles of the present invention and is subject to change without departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

Claims

1. A speaker lamp, comprising:

a speaker portion, comprising a sounding portion, a resonating cover, and a sound collecting cover, wherein said resonating cover and said sound collecting cover define a space therein, wherein said sounding portion is disposed in said resonating cover and divides, in a sealed manner, said space into a front sound chamber and a rear sound chamber; and

a lamp body, comprising a base, a light emitting portion disposed on said base, and a lamp cover arranged on the bottom of said base, wherein said base is arranged in said sound collecting cover, wherein sound produced by said sounding portion passes through said lamp body to be transmitted to the external environment.

2. The speaker lamp, as recited in claim 1, wherein said speaker portion comprises a connecting element, wherein said connecting element comprises a first connector, wherein said resonating cover is detachably arranged on said sound collecting cover through said first connector, wherein said resonating cover is provided on an upper space of said sound collecting cover.

3. The speaker lamp, as recited in claim 2, wherein said connecting element further comprises a second connector, wherein said sounding portion is arranged on said resonating cover through said second connector.

4. The speaker lamp, as recited in claim 1 or 3, wherein said base comprises an underframe and a set of attachment ends, wherein each said attachment end is extended outward from said underframe to form an L-shape with said underframe.

5. The speaker lamp, as recited in claim 4, wherein said sound collecting cover comprises a set of openings provided thereon at the positions corresponding to said attachment ends respectively, wherein each said attachment end passes through corresponded said opening respectively.

6. The speaker lamp, as recited in claim 5, wherein said sound collecting cover comprises a set of sealing elements, wherein said sealing elements are correspondingly arranged on said openings respectively, so as to enhance the imperviousness of the sound collecting cover.

7. The speaker lamp, as recited in claim 6, wherein said light emitting portion comprises a lens and an illuminator arranged on said lens, wherein when said illuminator is in a working state, said lamp body will function to illuminate.

8. The speaker lamp, as recited in claim 7, wherein said lamp body comprises a fireproof element, which further comprises a first fireproof element arranged on said lens and a second fireproof element arranged on said base.

9. The speaker lamp, as recited in claim 1, wherein said lamp cover comprises a set of sound bores, evenly arranged on said lamp cover in predetermined angles.

10. The speaker lamp, as recited in claim 1, wherein said sounding portion comprises a sounding element, wherein said sounding element comprises an information input terminal provided thereon for receiving wired or wireless audio signal.

11. The speaker lamp, as recited in claim 1, wherein said speaker portion further comprises a remote control, wherein said remote control comprises a data transmission module deployed on said sounding portion and a control module respectively electrically connected with said sounding portion and said illuminator, wherein data transmission module is for receiving operation signal so as to control the working states of said sounding portion and said illuminator.

12. The speaker lamp, as recited in claim 1, wherein said resonating cover comprises a wire hole arranged thereon and a wire, wherein said wire passes through said wire hole to be respectively electrically connected with said sounding portion and said illuminator, so as to allow said sounding portion and said illuminator to be connected to external power source.

13. The speaker lamp, as recited in claim 12, wherein said resonating cover comprises a pressure plate, matchingly arranged on said resonating cover, so as to protect said wire passing through said wire hole and to enhance the imperviousness of said resonating cover.

14. The speaker lamp, as recited in claim 1, wherein said sounding portion further comprises a resonator and a sounding element arranged on said resonator.

15. The speaker lamp, as recited in claim 7, wherein said lamp body comprises a radiator, arranged on said illuminator, so as for dissipating heat generated by said illuminator.

16. The speaker lamp, as recited in claim 15 wherein said radiator comprises at least a fin and a plurality of end portions arranged thereon, wherein both said fin and said end portions have a predetermined curve.

17. The speaker lamp, as recited in claim 2 wherein said first connector is selected from the group consisting of adhesive, screw, and buckle.

18. The speaker lamp, as recited in claim 3 wherein said second connector is a fastener.

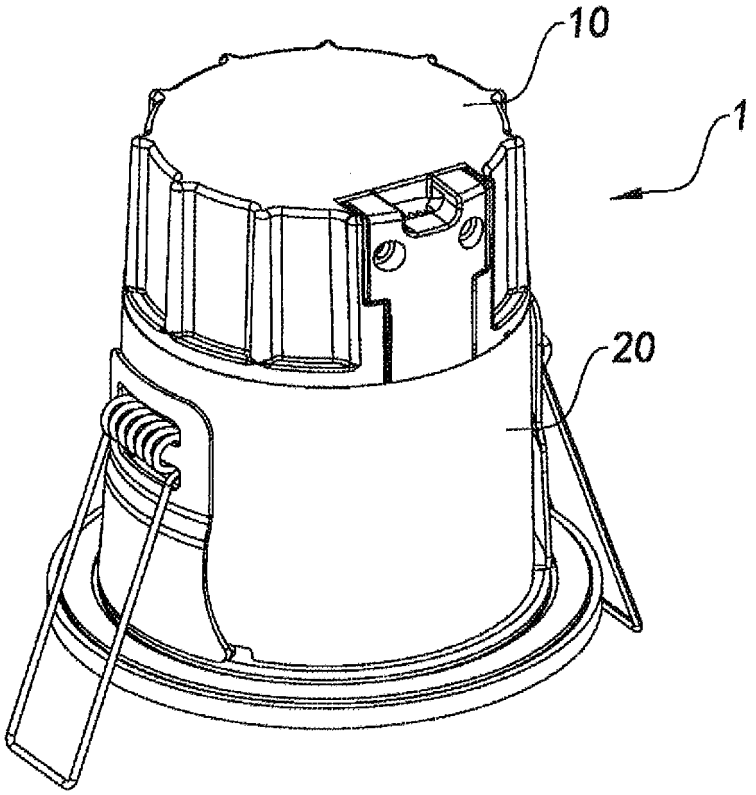

Fig.1A

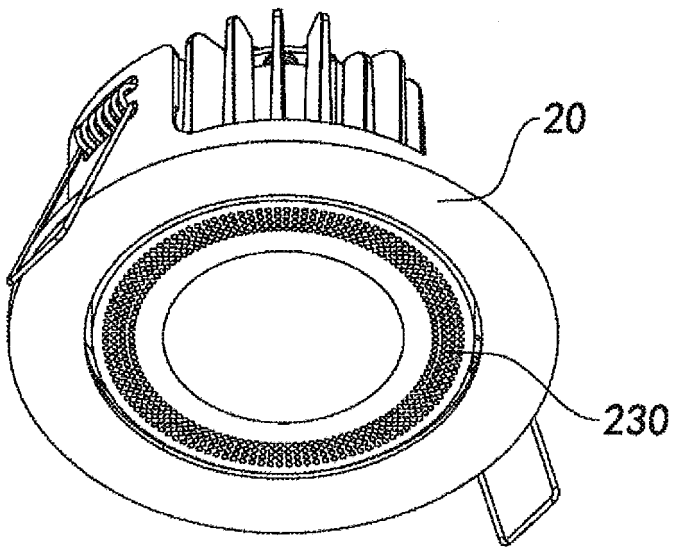

Fig.1B

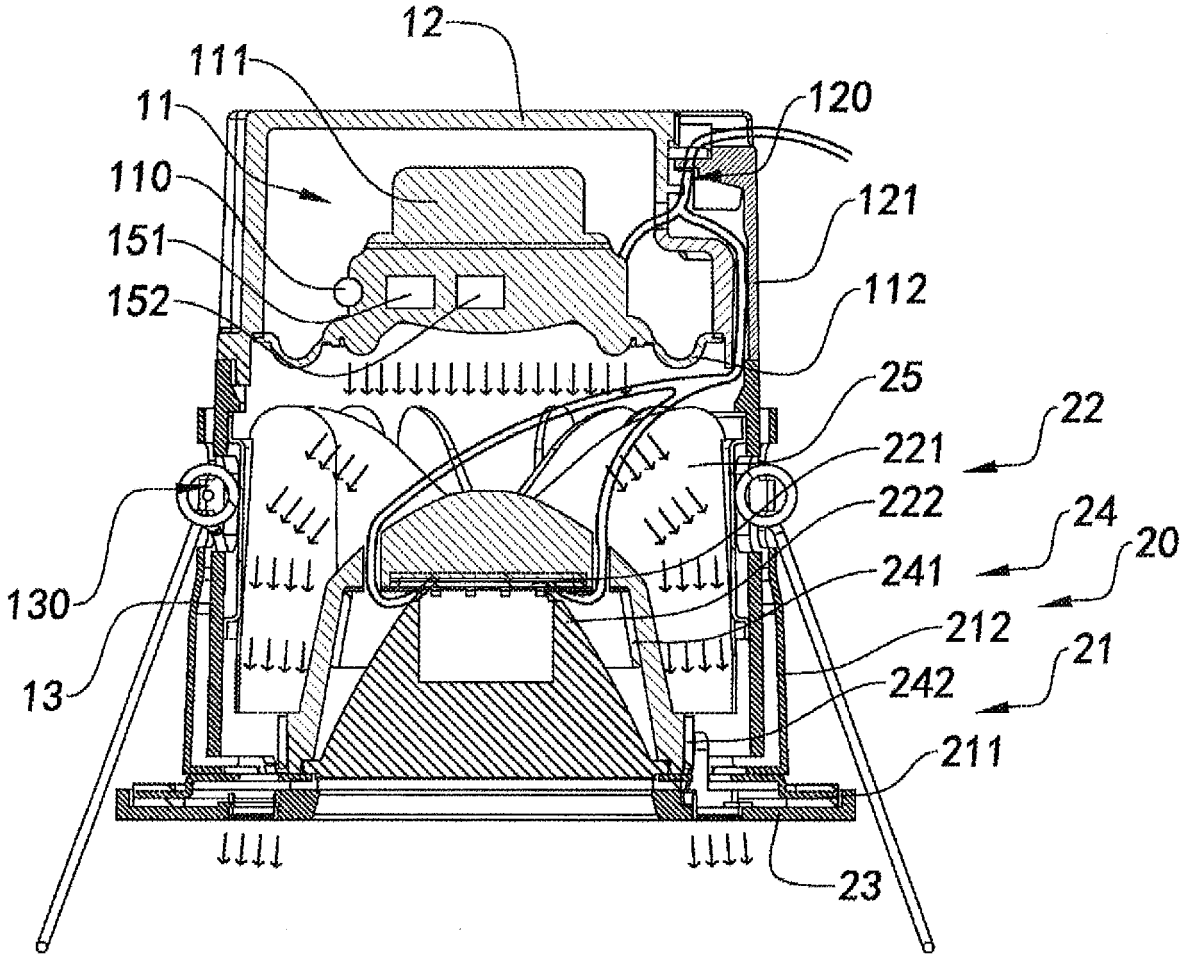
12
111
11
110
151
152
120
121
112
25
22
221
222
24
241
20
212
21
242
211
23
130
13

Fig.2

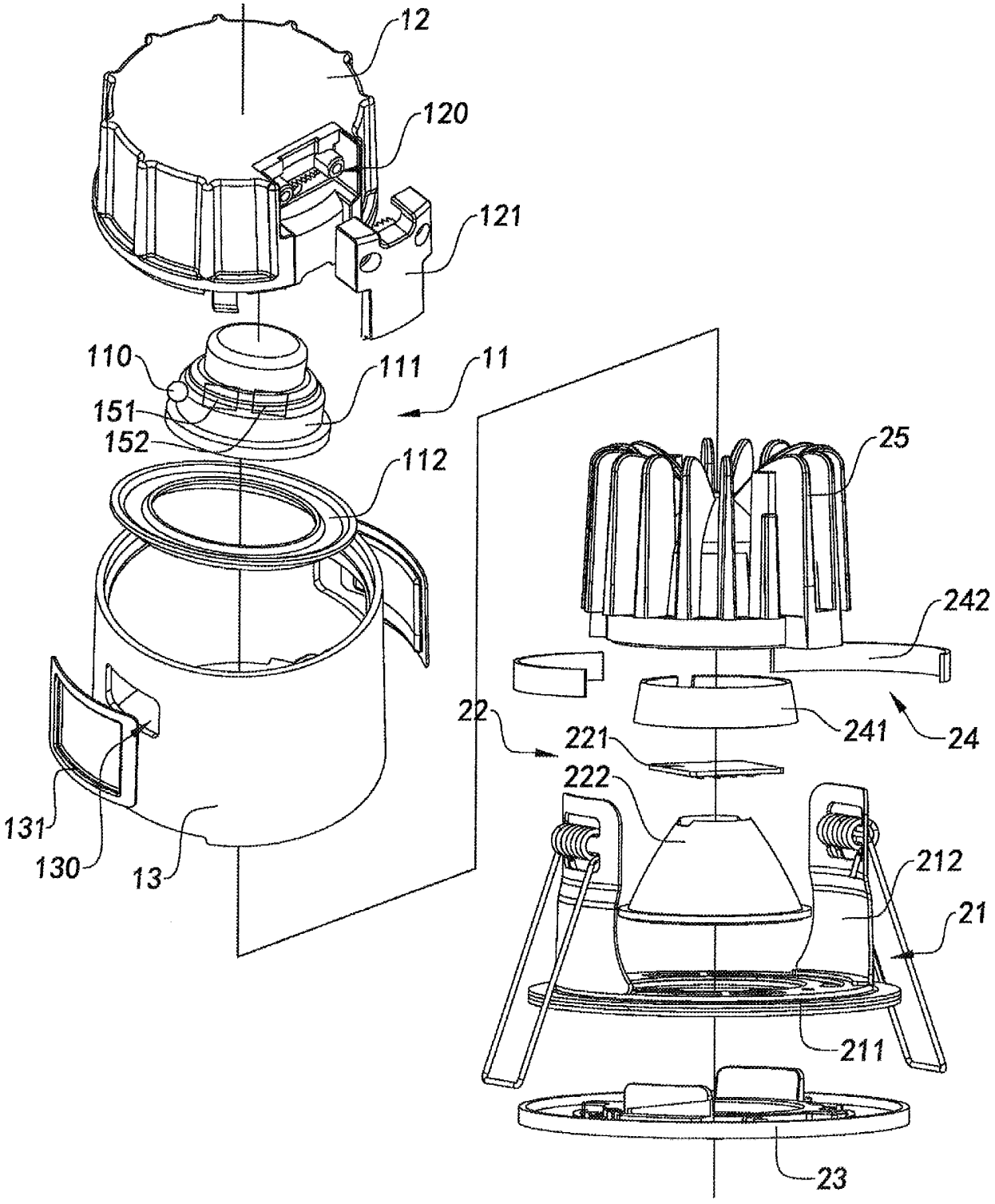
12
120
121
110
111
11
151
152
112
25
242
241
24
22
221
222
212
21
211
23
131
130
13

Fig.3

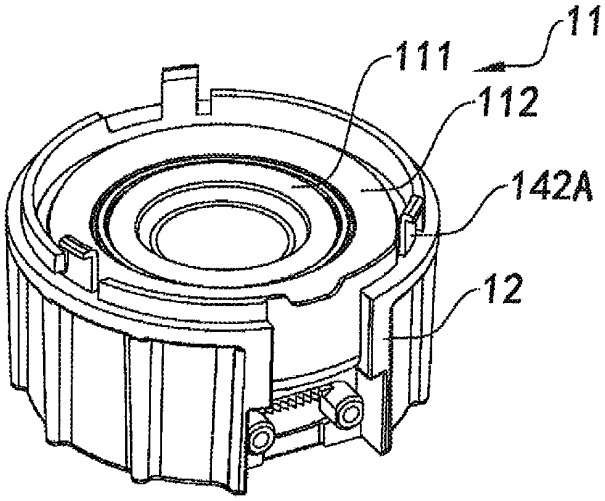

Fig.4A

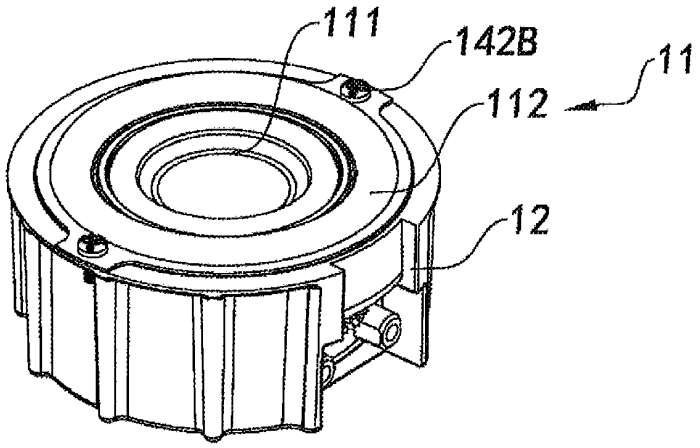

Fig.4B

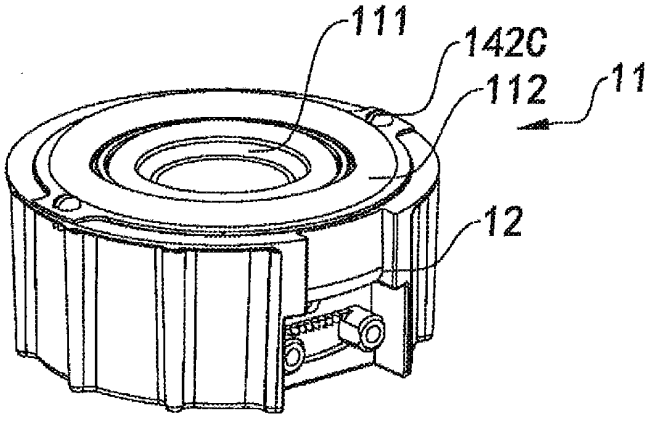

Fig.4C

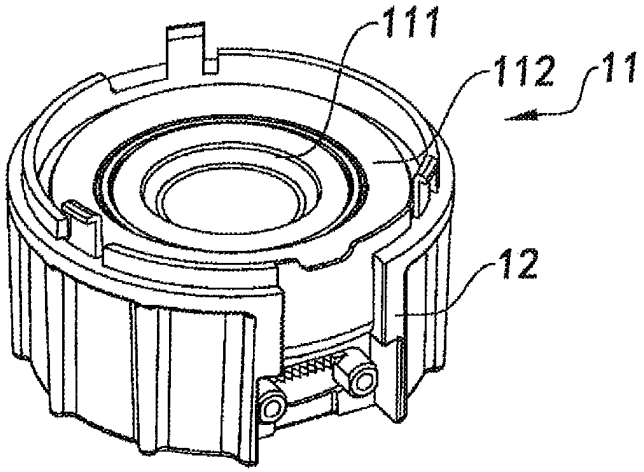

Fig.5A

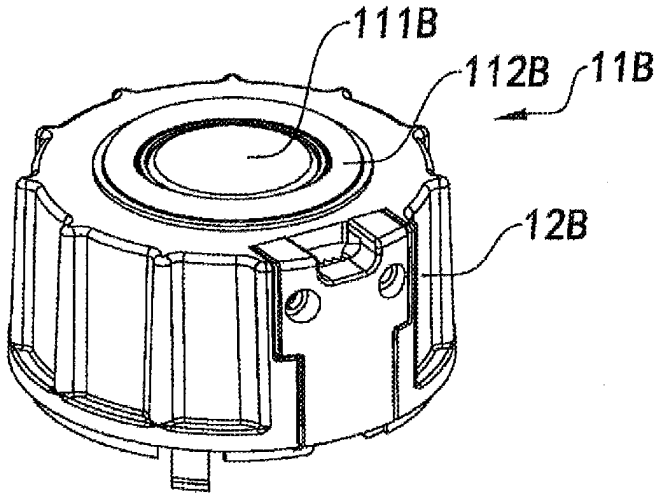

Fig.5B

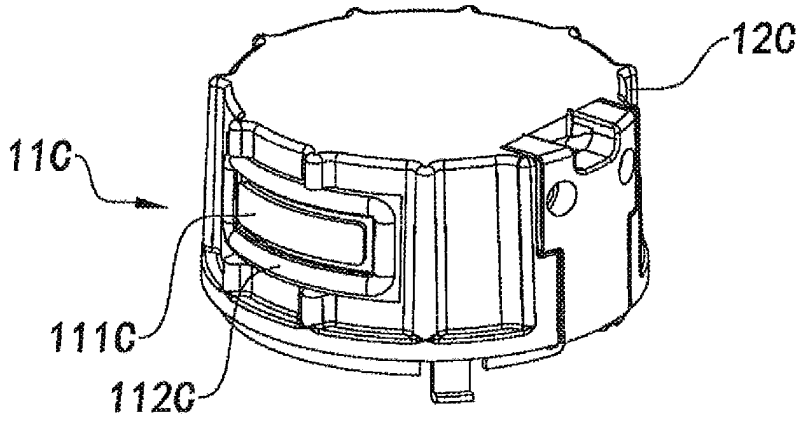

Fig.5C

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/074075

A. CLASSIFICATION OF SUBJECT MATTER

F21S 8/02 (2006.01) i; F21V 29/77 (2015.01) i; F21V 33/00 (2006.01) i; F21V 25/12 (2006.01) i; F21V 17/16 (2006.01) i; H04R 1/02 (2006.01) i

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)

F21, H04R

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 practicable, search terms used)

CNABS, CNTXT, VEN: WU, Liangju; front sound cavity, back sound cavity, sound collecting, acoust+, sonic+, sound+, reproduc+, loudspeaker+, projector+, microphon+, lamp+, front+, back+, cavit+, collect+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 205664230 U (VERTEX LIGHTING AND ELECTRICAL CO., LTD.), 26 October 2016 (26.10.2016), claims 1-18	1-18
A	CN 201611943 U (TIANJIN UNIVERSITY OF TECHNOLOGY AND EDUCATION et al.), 20 October 2010 (20.10.2010), the whole document	1-18
A	CN 102611972 A (CAI, Yunping), 25 July 2012 (25.07.2012), the whole document	1-18

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 May 2017 (11.05.2017)	**17 May 2017 (17.05.2017)**
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer **HUANG, Fei** Telephone No.: (86-10) **62085815**

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/074075

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 205664230 U	26 October 2016	None	
CN 201611943 U	20 October 2010	None	
CN 102611972 A	25 July 2012	CN 102611972 B	25 March 2015

Form PCT/ISA/210 (patent family annex) (July 2009)