



(51) International Patent Classification:

F21V 31/00 (2006.01) F21V 5/00 (2006.01)
F21V 17/16 (2006.01) F21W 131/103 (2006.01)
F21V 29/00 (2006.01) F21Y 105/00 (2006.01)

(21) International Application Number:

PCT/EP2013/060894

(22) International Filing Date:

27 May 2013 (27.05.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

201210177537.6 31 May 2012 (31.05.2012) CN

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: HOUSING FOR ILLUMINATION DEVICE AND ILLUMINATION DEVICE COMPRISING THE HOUSING

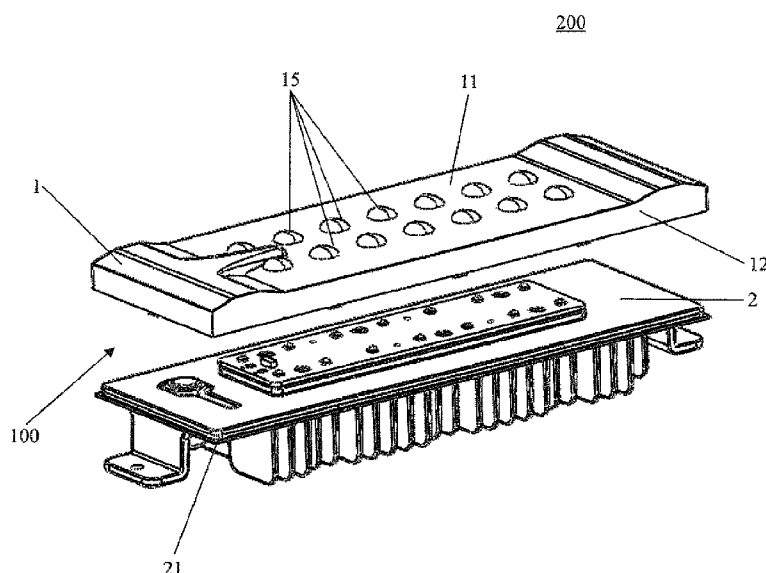


Figure 1

(57) Abstract: The present invention relates to a housing (100) for an illumination device, comprising a first housing portion (1), a second housing portion (2), and a sealing member (3) for sealing a joint between the first housing portion (1) and the second housing portion (2), wherein the sealing member (3) is made in one piece with one of the first housing portion (1) and the second housing portion (2), and is pressed sealingly against the other of the first housing portion (1) and the second housing portion (1). In addition, the present invention also relates to an illumination device (200) comprising the housing (100).



Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

Description

Housing for Illumination Device and Illumination Device
Comprising the Housing

5

Technical Field

The present invention relates to a housing for an illumination device. In addition, the present invention also relates to an illumination device comprising the housing.

10 Background Art

With the constant improvement of the level of the material and cultural life, more and more people choose to go out at night to take part in various activities. Consequently, it becomes more and more important to well illuminate the street. Besides, with the continuous development of the LED chip technology, people use the LED more and more frequently as the light source applied to the streetlamp for illuminating the street. However, this requires the housing of the streetlamp to have a good waterproof and dustproof performance since the streetlamp is used in the outdoor environment.

In the prior art, the housing of the streetlamp is usually composed of an upper housing portion and a lower housing portion. The two housing portions are locked together and form a cavity for accommodating an LED lighting assembly therein, wherein one housing portion has a transparent cover. In order to seal the housing, on a joint surface where the upper housing portion and the upper housing portion are pressed against each other is usually arranged a sealing ring made from a rubber. Such housing can be dustproof and waterproof to a certain degree. However, since the two housing portions are

locked together or fixed together via fastening bolts, the sealing ring is compressed to different degrees at different places between the housing portions, i.e. it may be tightly held at some places and loosely at some other places. The sealing effect may be unfavorable at the places where the sealing ring is loosely held, and water and dust possibly enter an inside of the housing from such places, thus causing damage to the LED lighting assembly therein.

Summary of the invention

In order to solve the above problem, the present invention proposes a housing for an illumination device. The housing is capable of providing an excellent waterproof performance with a simple structure and a low cost. In addition, the present invention also proposes an illumination device comprising the housing.

The first object of the present invention is realized by a housing for an illumination device, comprising: a first housing portion; a second housing portion; and a sealing member for sealing a joint between the first housing portion and the second housing portion, wherein the sealing member is made in one piece with one of the first housing portion and the second housing portion, and is pressed sealingly against the other of the first housing portion and the second portion. In a design solution of the present invention, the sealing member is made in one piece with one housing portion. Thus, at the time of assembly, it is unnecessary to place a sealing member between the housing portions, which thereby avoids invalid sealing due to dislocation of the sealing member. In addition, the one-piece structure of the sealing member and the housing portion has another advantage that, in the assembled housing, each portion of the sealing member bears a uni-

form force, which avoids invalid sealing resulting from deformation of the sealing member due to non-uniform force distribution.

Preferably, the sealing member is pressed against, in a manner of interference fit, the other of the first housing portion and the second housing portion. Therefore, an excellent sealing performance could be achieved between the first housing portion and the second housing portion.

According to a preferred design solution of the present invention, the sealing member partially projected from one of the first housing portion and the second housing portion in a direction to the other of the first housing portion and the second housing portion. The sealing member forms a projecting portion projecting from the housing portion, and when the first housing portion is assembled with the second housing portion, the portion of the sealing member which extends from the housing portion exactly forms a sealing portion between the first housing portion and the second housing portion.

Preferably, the first housing portion comprises a top wall and a circumferential side wall extending from the top wall, and the top wall and the circumferential side wall define an accommodation cavity. The accommodation cavity can accommodate, for example, a light-emitting assembly and other electronic devices of the illumination device.

Further preferably, the second housing portion comprises a circumferential edge for joining with the circumferential side wall. The circumferential edge is pressed against the circumferential side wall, such that the first housing portion and the second housing portion jointly form an enclosed space.

Advantageously, the sealing member extends in a circumferential direction of the circumferential side wall or the circumferential edge. In this way, the sealing member blocks any possible gap between the circumferential side wall and the circumferential edge, which prevents contaminants in the ambient from entering the housing according to the present invention.

According to a preferred design solution of the present invention, a locking structure is provided between the first housing portion and the second housing portion. In this way, the methods of connection via bolts or adhesion generally used in the prior art can be discarded, and the assembly of the housing according to the present invention becomes simpler.

Preferably, a projection is provided on the circumferential edge, and an end surface of the circumferential side wall is pressed against the projection. Since the circumferential side wall is pressed against the projection, the possible gaps between the circumferential side wall and the circumferential edge no longer directly face the ambient, but are covered by the projection, which improves, to a certain extent, the capability of the housing in blocking contaminants.

Further preferably, the locking structure comprises at least one through hole provided in the projection, and at least one hook provided on the end surface, the hook being engaged with the through hole. At the time of assembling the housing according to the present invention, during the process of aligning the first housing portion with the second housing portion for assembly, the hook is automatically engaged with the through hole, and when the two housing portions are completely engaged with each other, the hook is hooked to the

outer side of the through hole, such that the snap-fit connection between the two housing portions is achieved, which greatly simplifies the assembly of the housing.

Advantageously, the sealing member is made of a flexible material, and in particular, the flexible material can be soft plastic or rubber. Of course, the sealing member can be made of other types of materials that are suitable for the sealing member.

Preferably, the sealing member is made in one piece with the first housing portion or the second housing portion through an over molding process. In this way, it is possible to make the sealing member and the corresponding housing portion in one piece with a low cost.

Advantageously, at least one lens structure is provided on the top wall. Here, the first housing portion having the top wall serves as a lamp cover of the illumination device, and the lens structure formed thereon can adjust the light emitted by the light-emitting assembly of the illumination device, so as to meet the corresponding illumination requirements.

Advantageously, the second housing portion is configured as a heat dissipation device for the illumination device. The advantage of using the heat dissipation device as the second housing portion lies in: it is unnecessary to arrange an additional housing for the light-emitting assembly, and the heat from the light-emitting assembly can be directly dissipated to the ambient through the heat dissipation device which serves as the second housing portion.

The other object of the present invention is achieved by an

illumination device comprising the housing of the above type. The illumination device according to the present invention has excellent sealing performance, can be easily assembled, and has good appearance.

- 5 Preferably, the illumination device further comprises an LED light engine disposed in the housing. The LED light engine has the advantages of high light efficiency, long service life and environmental protection.

It is to be understood that the features of the various exemplary embodiments described herein may be combined with each other, unless specifically noted otherwise.

Brief Description of the Drawings

The drawings constitute a portion of the Description for further understanding of the present invention. These drawings illustrate the embodiments of the present invention and explain the principle of the present invention together with the Description. In the drawings, the same part is represented by the same reference sign. In the drawings,

Fig. 1 is an exploded perspective view of the illumination device according to the present invention;

Fig. 2 is a local view of the first housing portion of the housing according to the present invention;

Fig. 3 is a sectional view of the first housing portion of the housing according to the present invention;

25 Fig. 4 is a schematic diagram of the locking structure of the housing according to the present invention; and

Fig. 5 is a local schematic diagram of the housing in the locking structure area in an assembled state of the housing according to the present invention.

Detailed Description of the Embodiments

5 In the following detailed Description, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. In this regard, directional terminology, such as "top", "bottom", "circumferen-

10 tial" etc., is used with reference to the orientation of the Figure(s) being described. Because components of embodiments can be positioned in a number of different orientations, the directional terminology is used for purposes of illustration and is in no way limiting. It is to be understood that other

15 embodiments may be utilized and structural or logical changes may be made without departing from the scope of the present invention. The following detailed description, therefore, is not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims.

20 Fig. 1 is an exploded perspective view of the illumination device 200 according to the present invention. As can be seen from the figure, the illumination device 200 according to the present invention comprises a housing 100 and an LED light engine 5 disposed in the housing 100. In addition, as can be

25 further seen from the figure, the housing 100 according to the present invention comprises a first housing portion 1 and a second housing portion 2, and in an assembled state, the first housing portion 1 and the second housing portion 2 are engaged with each other. In the present embodiment, the first

30 housing portion 1 is configured as a lamp cover of the illumination device 200, comprising a top wall 11 and a circum-

ferential side wall 12 extending from the top wall 11, the top wall 11 and the circumferential side wall 12 defining an accommodation cavity 4 (see Fig. 2). Here, a plurality of lens structures 15 are formed on the top wall 11. The second housing portion 2 is configured as a heat dissipation device for the illumination device 200. Of course, the first housing portion 1 and the second housing portion 2 are not limited to the above two forms, and they also can be two housing portions only for accommodating the elements of the illumination device.

As can be seen from the figure, the second housing portion 2 comprises a circumferential edge 21, and in an assembled state, the second housing portion 2 is inserted into the first housing portion 1 such that the circumferential edge 21 is accommodated in the accommodation cavity 4 and is pressed against the circumferential side wall 12. Here, the LED light engine 5 of the illumination device 200 according to the present invention is disposed on the second housing portion 2 and in thermal conduct with the second housing portion 2. As can be seen from the figure, the LED light engine 5 comprises a plurality of LED chips, so as to form an array. When the illumination device is used as a street lamp, the light-emitting array can favorably meet the requirements of street illumination. In addition, in order to achieve superior illumination effect, each LED chip corresponds to one lens structure 15. Of course, one common lens structure 15 can be arranged for these LED light engines 5.

Fig. 2 is a local view of the first housing portion 1 of the housing 100 according to the present invention. The figure shows half of the first housing portion 1. The figure shows the first housing portion 1 in Fig. 1 from another angle, and thereby, the internal structure of the first housing portion

1 can be seen. As can be seen from the figure, a sealing member 3 is formed on the circumferential side wall 12 of the first housing portion 1. The sealing member 3 is made in one piece with the first housing portion 1. Moreover, the sealing member 3 partially extends from the first housing portion 1, and is pressed, in a manner of interference fit, against the second housing portion 2 in the assembled state of the housing 100. As can be seen from the figure, the sealing member 3 extends in a circumferential direction of the circumferential side wall 12. In addition, according to a preferred design solution of the present invention, the sealing member 3 is made of a flexible material which, in particular, is soft plastic or rubber. In the present embodiment, the sealing member 3 is made of rubber.

15 In the second embodiment according to the present invention which is not shown, the heat dissipation device serving as the second housing portion 2 can be made of thermal conductive plastic, and thereby, the one-piece design of the sealing member 3 and the second housing portion 2 can be realized through an over molding process, that is, the sealing member 3 is integrally formed on the circumferential edge 21 the second housing portion 2.

Fig. 3 shows the relative position of the sealing member 3 in the first housing portion 1, and the figure can also indicate the relative position of the sealing member 3 in the second housing portion 2. As can be seen from Fig. 3, the sealing member 3 is made in one piece with the first housing portion 1 through an over molding process. However, the sealing member 3 is just partially enclosed by the circumferential side wall 12 of the first housing portion 1, and a portion of the sealing member 3 is exposed from the circumferential side wall 12, such that when the first housing portion 1 is en-

gaged with the second housing portion 2, the exposed portion can prevent contaminants from entering the housing 100.

Fig. 4 is a schematic diagram of the locking structure of the housing according to the present invention, wherein the locking structure is disposed between the first housing portion 1 and the second housing portion 2. In order to form the locking structure, a projection 22 is provided on the circumferential edge 21 of the second housing portion 2, and in the assembled state of the housing 100, an end surface 13 of the circumferential side wall 12 is pressed against the projection 22 (see Fig. 5). In addition, at least one through hole 23 is provided in the projection 22, at least one hook 14 is provided on the end surface 13, and in the assembled state of the housing 100, the hook 14 passes through the through hole 23 from one side, and is engaged with the other side of the through hole 23.

Fig. 5 is a local schematic diagram of the housing 100 in the locking structure area in an assembled state of the housing according to the present invention. As can be seen from the figure, the first housing portion 1 and the second housing portion 2 are in the snap-fit connection through the hook 14 and the through hole 23, and the exposed portion of the sealing member 3 is held between the first housing portion 1 and the second housing portion 2, which thereby forms superior sealing. As can be seen from the figure, a snap-fit protrusion 231 is formed in the through hole 23, a protruding portion 141 of the hook 14 is engaged with the snap-fit protrusion 231, and the hook 14 does not pass through the through hole 23, which improves, to a certain extent, the aesthetic property of the housing 100 according to the present invention.

Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention. This application is intended to cover any adaptations or variations of the specific embodiments discussed herein. Therefore, it is intended that this invention be limited only by the claims and the equivalents thereof.

List of reference signs

	1	first housing portion
	11	top wall
	12	circumferential side wall
5	13	end surface
	14	hook
	141	protruding portion
	15	lens structure
	2	second housing portion
10	21	circumferential edge
	22	projection
	23	through hole
	231	snap-fit protrusion
	3	sealing member
15	4	accommodation cavity
	5	LED light engine
	100	housing
	200	illumination device

Claims

1. A housing (100) for an illumination device, comprising:
a first housing portion (1); a second housing portion (2);
5 and a sealing member (3) for sealing a joint between the
first housing portion (1) and the second housing portion (2),
characterized in that, the sealing member (3) is made in one
piece with one of the first housing portion (1) and the sec-
ond housing portion (2), and is pressed sealingly against the
10 other of the first housing portion (1) and the second housing
portion (2).

2. The housing (100) according to Claim 1, characterized in
that, the sealing member (3) is pressed against, in a manner
of interference fit, the other of the first housing portion
15 (1) and the second housing portion (2).

3. The housing (100) according to Claim 1 or 2, character-
ized in that, the sealing member (3) partially projected from
one of the first housing portion (1) and the second housing
portion (2) in a direction to the other of the first housing
20 portion (1) and the second housing portion (2).

4. The housing (100) according to Claim 1 or 2, character-
ized in that, the first housing portion (1) comprises a top
wall (11) and a circumferential side wall (12) extending from
the top wall (11).

25 5. The housing (100) according to Claim 4, characterized in
that, the second housing portion (2) comprises a circumferen-
tial edge (21) for joining with the circumferential side wall
(12).

6. The housing (100) according to Claim 5, characterized in

that, the sealing member (3) extends in a circumferential direction of the circumferential side wall (12) or the circumferential edge (21).

7. The housing (100) according to Claim 5, characterized in that, a locking structure is provided between the first housing portion (1) and the second housing portion (2).

8. The housing (100) according to Claim 7, characterized in that, a projection (22) is provided on the circumferential edge (21), and an end surface (13) of the circumferential side wall (12) is pressed against the projection (22).

9. The housing (100) according to Claim 8, characterized in that, the locking structure comprises at least one through hole (23) provided in the projection (22), and at least one hook (14) provided on the end surface (13), the hook (14) engages with the through hole (23).

10. The housing (100) according to Claim 1 or 2, characterized in that, the sealing member (3) is made of a flexible material.

11. The housing (100) according to Claim 10, characterized in that, the flexible material is soft plastic or rubber.

12. The housing (100) according to Claim 1 or 2, characterized in that, the sealing member (3) is made in one piece with the first housing portion (1) or the second housing portion (2) through an over molding process.

13. The housing (100) according to Claim 4, characterized in that, at least one lens structure (15) is provided on the top wall (11).

14. The housing (100) according to Claim 1 or 2, characterized in that, the second housing portion (2) is configured as a heat dissipation device for the illumination device.

15. An illumination device (200), characterized in that, the
5 illumination device (200) comprises a housing (100) according to any of Claims 1-14.

16. The illumination device (200) according to Claim 15, characterized in that, the illumination device (200) further comprises an LED light engine (5) disposed in the housing
10 (100).

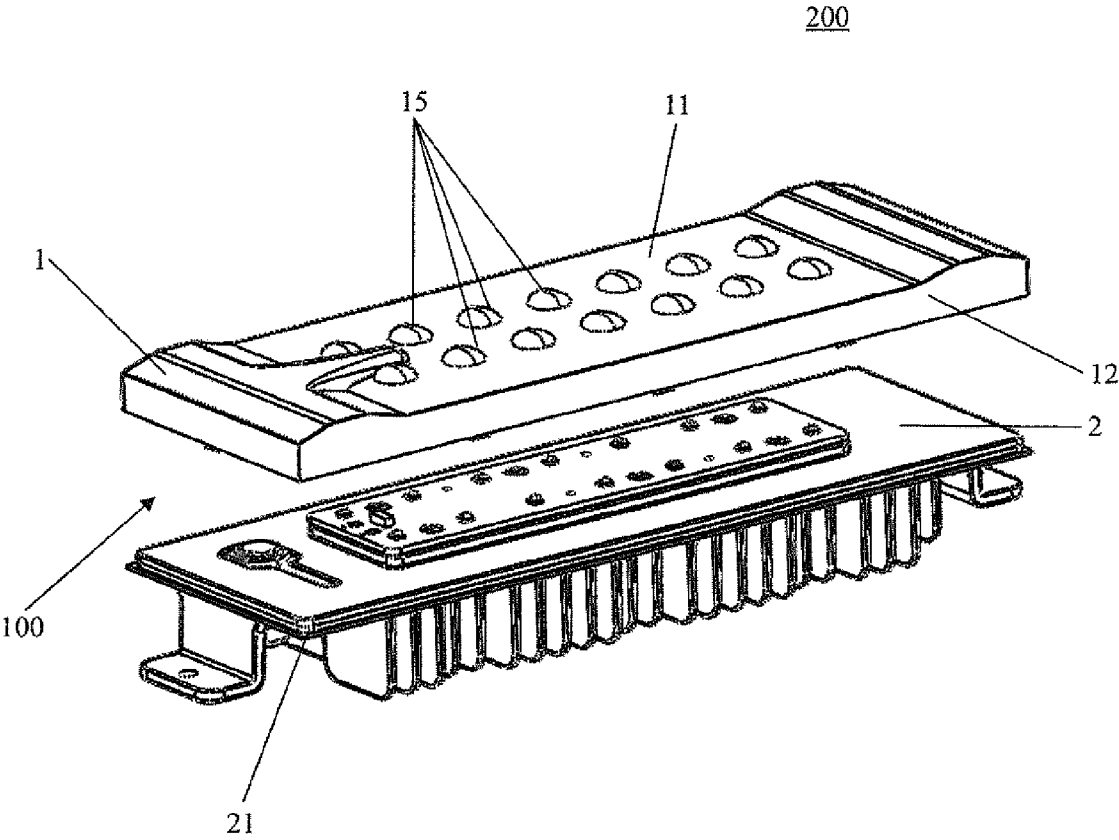


Figure 1

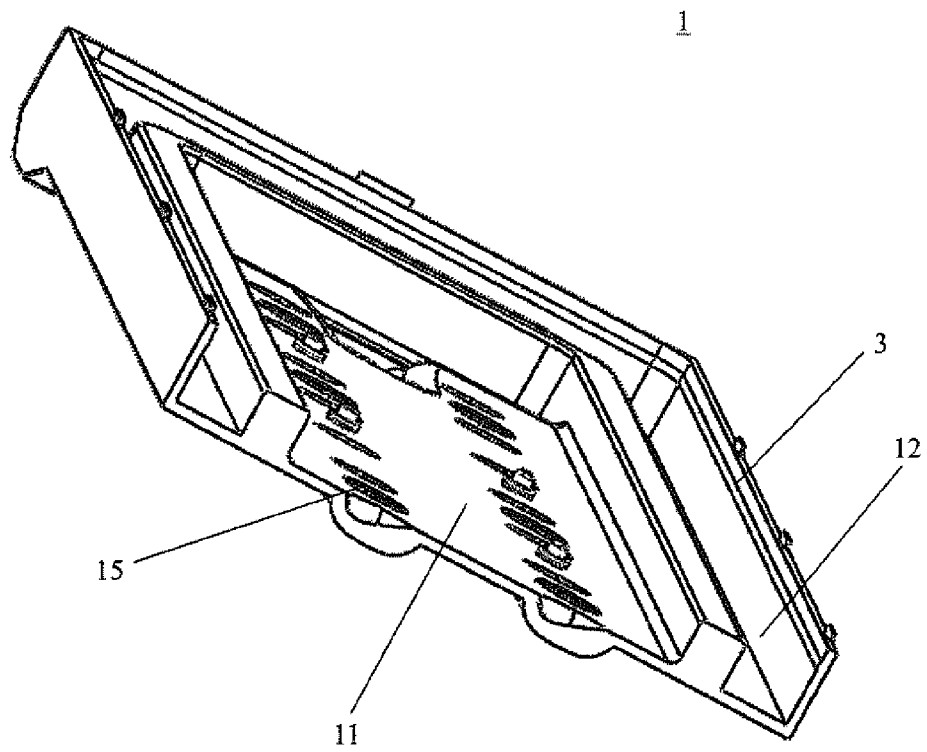


Figure 2

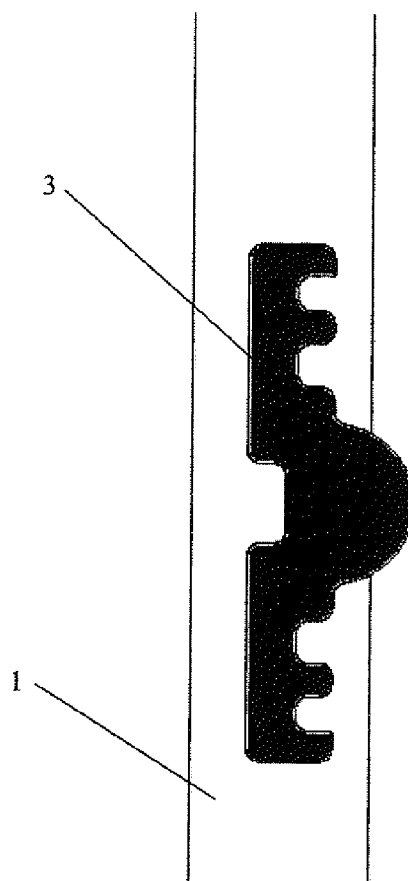


Figure 3

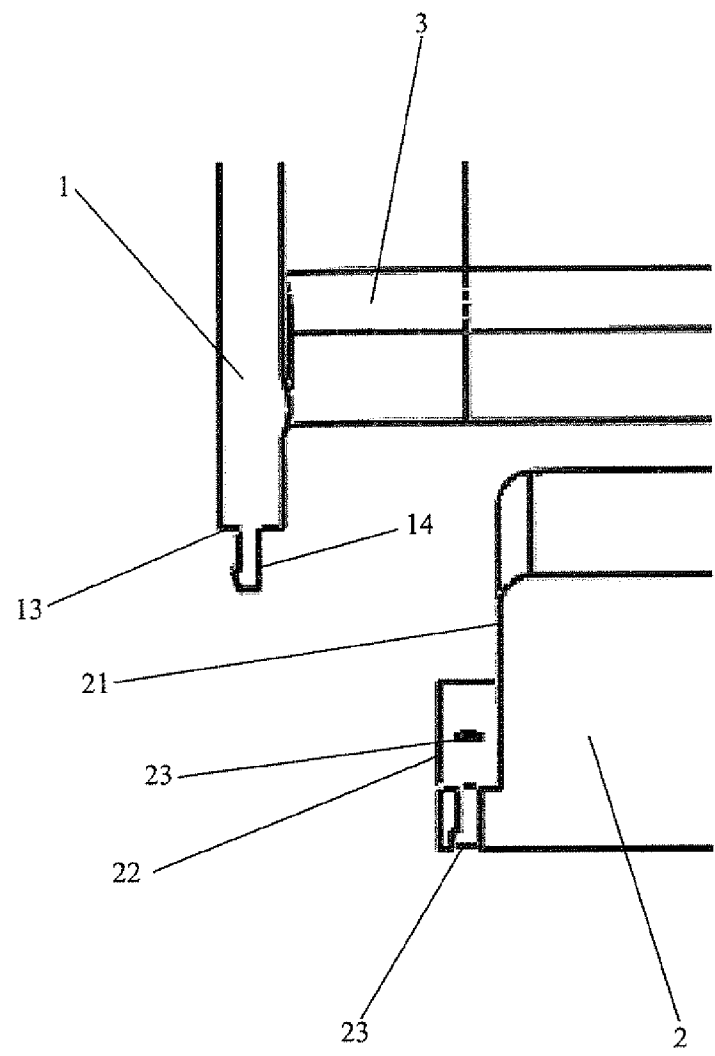


Figure 4

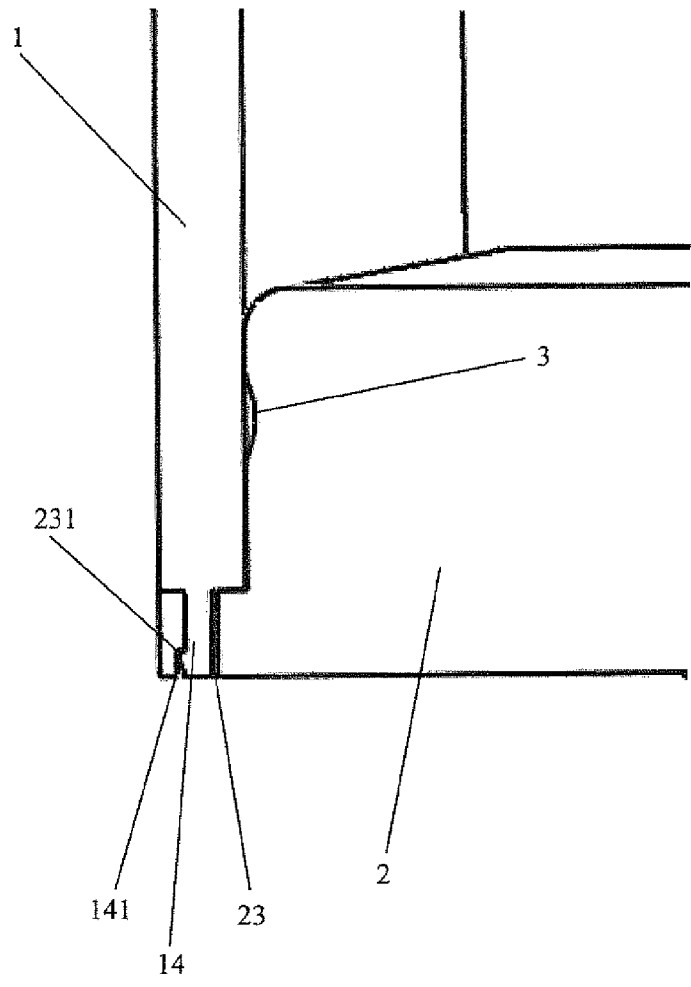


Figure 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/060894

A. CLASSIFICATION OF SUBJECT MATTER INV. F21V31/00 ADD. F21V17/16 F21V29/00 F21V5/00 F21W131/103 F21Y105/00		
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) F21V F21W F21Y		
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) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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☒ 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 17 September 2013		Date of mailing of the international search report 26/09/2013
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 Menn, Patrick

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INTERNATIONAL SEARCH REPORT

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