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

(11) **EP 2 463 578 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
**21.05.2014 Bulletin 2014/21**

(51) Int Cl.:
***F21V 21/04*** *(2006.01)* *F21S 8/02* *(2006.01)*

(21) Application number: **10194410.6**

(22) Date of filing: **09.12.2010**

# (54) Device for securing fixtures

Vorrichtung zur Sicherung von Halterungen

Dispositif de sécurisation d'appareils

(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**

(43) Date of publication of application:
**13.06.2012 Bulletin 2012/24**

(73) Proprietor: **Antares Iluminación S.A.**
**46394 Ribarroja (Valencia) (ES)**

(72) Inventor: **Martinez Weber, Federico**
**46394 Ribarroja (Valencia) (ES)**

(74) Representative: **Pons Ariño, Angel et al**
**Pons Patentes y Marcas Internacional, S.L.**
**Glorieta Rubén Dario 4**
**28010 Madrid (ES)**

(56) References cited:
**EP-A2- 1 139 018**
**FR-E- 81 325**
**JP-A- 56 116 204**
**US-A- 5 068 772**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 463 578 B1

Printed by Jouve, 75001 PARIS (FR)

## Description

**[0001]** The present invention refers to a device for securing fixtures, particularly for lighting fixtures.

### BACKGROUND OF THE INVENTION

**[0002]** Systems for securing lighting fixtures on panelboard structures such as ceilings or walls, particularly false ceilings, are known.

**[0003]** Said securing systems substantially consist of a plurality of arms that are deflected by elastic means interacting with the structure to which the lighting fixture is fixed.

**[0004]** Specifically, lighting securing systems that are fixed within an opening in a false ceiling or similar structure are known.

**[0005]** These securing systems comprise a plurality of elastically deflected radial arms, which are attached to the lighting fixture at one of their ends. Each arm is elastically deflected by a spring, which tends to radially move the free end of the arm out from the lighting fixture.

**[0006]** To secure the lighting fixture to the false ceiling, the lighting fixture is inserted into an opening in the false ceiling. Before inserting the lighting fixture into the opening, it is necessary to bend or force the arms inward against the resilient action of the springs which tend to move the arms radially outward. This must be done by hand, and the user must hold the arms folded while inserting the lighting fixture into the opening.

**[0007]** Once the top of the lighting fixture is inserted into the opening of the ceiling, the user releases the arms, which are deflected radially outwards by the respective springs. The arms press against the wall of the opening as they are outwardly deflected.

**[0008]** Once the lighting fixture is fully inserted into the opening, the arms pass through the false ceiling panel and stop pressing the walls of the opening and extend completely, now resting on the upper surface of the false ceiling. Thus, the lighting fixture is secured to the false ceiling by the action of the arms.

**[0009]** The drawback of the described systems is that users must hold the resiliently deflected arms with their hands before inserting them into the opening, which makes the assembly operation of the lighting fixture difficult.

**[0010]** It is also possible that the free ends of the arms damage the inside walls of the opening in the false ceiling when the lighting system is being inserted into the opening, since the deflecting force of the arms can be strong and the material with which the false ceiling is made of is usually weak.

**[0011]** Finally, the systems described greatly hinder the removal of the lighting fixture, since the user must exert considerable force to overcome the deflecting force exerted by the spring and extract the lighting fixture from the opening. Typically, the user must pull the lighting fixture to move the arms inwardly, which can cause damage to the false ceiling if the operation is not performed carefully.

**[0012]** US 5068772 shows a fixture according to the preamble of claim 1.

### DESCRIPTION OF THE INVENTION

**[0013]** The aim of the present invention is to solve the drawbacks of the devices known in the art by providing the fixture and the device for securing the fixture of claim 1.

**[0014]** Thanks to these characteristics, a fixture securing device that allows the easy and smooth securing of the fixture on a panel member by avoiding having to make considerable efforts and possible damage to the panel member is provided.

**[0015]** The curved shape of the securing elastic member facilitates the insertion of the fixture in an opening of the panel member, said elastic member being compressed by the walls of this opening until the element passes through the panel and returns to its original resting form.

**[0016]** The action of the walls of the opening on the curved portion is 'tangential' and continuous. This continuous deformation of the elastic member prevents sudden or violent movements of the elastic member that may damage the panel member, as happened in the prior art devices. Also, the curved configuration of the elastic member prevents users from having to hold said elastic member with their hands before inserting the fixture into the opening.

**[0017]** Preferably, the outer curved portion comprises a band of elastic material. The band of elastic material may be a flat metal or plastic band being elastic and resistant enough to fulfil its function.

**[0018]** As already stated, the two ends of the outer curved portion are connected the one to the other by the outer curved portion itself and by another element, so that the relative position between these ends is always fixed. This other element comprises an additional segment of the elastic member or part of the fixture itself. That is, the elastic member and/or the outer curved portion comprise or form part of a closed body as a resiliently deformable loop without ends.

**[0019]** Also advantageously, a line joining the two ends of the outer curved portion is substantially perpendicular to the plane of the opening when inserting the fixture into the opening.

**[0020]** According to an embodiment of the invention, the elastic member is substantially D-shaped.

**[0021]** Preferably, the fixture is a lighting fixture.

**[0022]** In the present specification the term fixture means in a particularly preferred way a lighting fixture, although this term also includes other devices such as speakers, cameras, detectors, or the like.

## BRIEF DESCRIPTION OF DRAWINGS

**[0023]** In order to facilitate the description of all the above previously exposed, some drawings are included in which, schematically and only by way of non restrictive example, a practical case of embodiment of the fixing device according to the invention is represented, wherein:

Figure 1 is a perspective view of a lighting device comprising the fixing device of the present invention; Figures 2 to 4 are representative views showing the assembly of a lighting device on a false ceiling using the fixing device of the present invention.

## DESCRIPTION OF A PREFERRED EMBODIMENT

**[0024]** Figure 1 shows a lighting fixture 1 and a pair of securing devices 2 according to the present invention. Each securing device 2 comprises an elastic member 3 and an upper support 4. The elastic member 3 comprises a D-shaped body made of a band of flexible material and includes a curved outer portion 5 and a straight segment 6.

**[0025]** The curved outer portion 5 comprises an upper end 5a and a lower end 5b, which are connected by the curved outer portion itself 5 and the straight segment 6.

**[0026]** Each securing device 2 is attached to a respective vertical extension 7 located on diametrically opposite sides of the lighting fixture 1 by screws 8 passing through a hole in each upper support 4 and are screwed to a threaded hole located on top of each vertical extension 7.

**[0027]** When each securing device 2 is mounted in the lighting fixture 1, the same is arranged as shown in figures 2-4, with the straight segment 6 and the ends 5a and 5b positioned adjacent to each respective vertical extension 7.

**[0028]** The assembly of the securing device 2 in the lighting fixture 1 can be carried out in any other known way.

**[0029]** Figures 2-4 further show the assembly procedure of the lighting fixture 1 in a panel member 10, such as a false ceiling. The false ceiling 10 comprises a circular opening 11 cut through it wherein the lighting fixture 1 is inserted to mount it on the ceiling 10.

**[0030]** The lighting fixture 1 with the elastic members 3 mounted on the same (Figure 2) is inserted into the opening 11 by moving it in the direction of its longitudinal axis perpendicularly to the plane of the opening 11 and the false ceiling 10. Each curved outer portion 5 is also oriented with its longitudinal extension perpendicular to the plane of the opening 11 and false ceiling 10.

**[0031]** At resting state, the curved outer portion 5 of each elastic member 3 comprises a configuration in which the distance d between the outer surface of both curved outer portions 5 further away from the centre of the lighting device 1 is larger than the diameter D of the opening 11.

**[0032]** When starting to insert the lighting fixture 1 in the opening 11, the curved outer portions 5 are compressed towards the centre of the lighting fixture 1 by the inner walls of the opening 11 (Figure 3). The force required to deform and compress the curved outer portions 5 is exerted by the user by pushing up the lighting fixture 1. As the lighting fixture 1 is moved upwards, the length of the curved outer portions 5 adjacent to the inner walls of the opening 11 slides on them and is compressed toward the centre of the lighting fixture 1.

**[0033]** Thanks to the curved shape of the portions 5, the effort required to insert the lighting fixture 1 and necessary to deform said curved outer portions 5 is reduced, as the deformation occurs continuously and gradually.

**[0034]** When the lighting fixture 1 has been fully inserted into the opening 11 (figure 4), until its bottom is adjacent to the lower edges of the opening 11, the majority of the curved outer portions 5 has passed through the opening 11 and is on the opposite side (top side) of the false ceiling 10. Due to the fact that the curved outer portions 5 tends to recover their original shape or resting state (see figure 2), they extend outward so that the distance d between the outer surface of both curved outer portions 5 further away from the centre of the lighting device 1 is larger than the diameter D of the opening 11. Therefore, the lighting fixture 1 is retained in the false ceiling 10 by the curved outer portions 5.

**[0035]** If the user wishes to remove the lighting fixture 1 from the false ceiling 10, it only need to pull down the lighting fixture 1, so that the curved outer portions 5 are again distorted and compressed by the inner walls of the opening 11 following the inverse sequence to that described above.

**[0036]** The effort required to remove the lighting fixture 1 will be considerably less than the effort required to perform the same operation in securing devices known in the art using elastically deflected arms. In addition, due to the smooth and continuous contact between the curved outer portions 5 and the inner walls of the opening 11, the potential damage to the ceiling material when mounting or removing the lighting fixture 1 are minimized or eliminated.

**[0037]** In the embodiment shown herein, the elastic member 3 is substantially D-shaped, and the ends 5a, 5b of the curved outer portion 5 are connected together by means of both, the curved outer portion 5 itself and the straight segment 6. However, instead of being connected by the straight segment 6, the ends 5a, 5b may also be connected, for example, through a part of the lighting fixture 1, so that the relative position between both ends 5a, 5b is always fixed.

**[0038]** The elastic member 3 will be made of a sufficiently elastic and resilient material allowing for its suitable use in the securing device 2 of the present invention. A suitable material is steel, although other materials, such as plastics, are possible.

**[0039]** The present invention is specially designed for use in lighting fixtures. However, its use is also provided

for securing other fixtures such as wall speakers, cameras or detectors.

**[0040]** Finally, in the present invention the term panel member means any structure in which it is possible to mount a fixture in the manner described above, the element comprising preferably a false ceiling, but can also comprise walls or other structures.

## Claims

1. A fixture (1) and a device (2) for securing the fixture (1), comprising securing means for securing the fixture (1) to an opening (11) on a panel member (10), said securing means including two elastic members (3) associated with the fixture (1), each elastic member (3) including an outer curved portion (5) comprising an expanded rest condition and which is elastically compressed by the opening (11) when inserting the fixture (1) into said opening (11), the outer curved portion (5) recovering its expanded rest condition after passing through the opening (11) and retaining the fixture in the panel member (10), **characterized in that** the two ends (5a, 5b) of the outer curved portion (5) are connected to each other by the outer curved portion (5) itself and by a straight segment (6) of the elastic member (3), so that the relative position between both ends (5a, 5b) is always fixed, and **in that** each elastic member (3) is attached to respective vertical extensions (7) located on diametrically opposite sides of the fixture (1), with the straight segment (6) and the ends (5a, 5b) of each elastic member (3) positioned adjacent to each respective vertical extension (7).

2. A fixture (1) and a device (2) for securing the fixture (1) according to claim 1, **characterized in that** the outer curved portion (5) comprises a band of elastic material.

3. A fixture (1) and a device (2) for securing the fixture (1) according to any of the preceding claims, **characterized in that** a line joining the two ends (5a, 5b) of the outer curved portion (5) is substantially perpendicular to the plane of the opening (11) when inserting the fixture (1) into the opening (11).

4. A fixture (1) and a device (2) for securing the fixture (1) according to any of the preceding claims, **characterized in that** the elastic member (3) is substantially D-shaped.

5. A fixture (1) and a device (2) for securing the fixture (1) according to any of the preceding claims, **characterized in that** the fixture is a lighting fixture (1).

## Patentansprüche

1. Eine Haltevorrichtung (1) und eine Vorrichtung (2) zur Sicherung der Haltevorrichtung (1), die Sicherungsmittel zur Sicherung der Haltevorrichtung (1) an einer Öffnung (11) eines Plattenelements (10) umfasst, wobei die besagten Sicherungsmittel zwei elastische Elemente (3) einschließen, die mit der Haltevorrichtung (1) verknüpft sind, wobei jedes elastische Element (3) einen äußeren gekrümmten Teil (5) einschließt, der einen expandierten Ruhezustand umfasst und elastisch von der Öffnung (11) zusammengepresst wird, wenn die Haltevorrichtung (1) in die besagte Öffnung (11) eingeführt wird, wobei der äußere gekrümmte Teil (5) seinen expandierten Ruhezustand wieder erlangt, nachdem er die Öffnung (11) passiert hat, und die Haltevorrichtung im Plattenelement (10) sichert, **dadurch gekennzeichnet, dass** die beiden Enden (5a, 5b) des äußeren gekrümmten Teils (5) durch das äußere gekrümmte Teil (5) selbst und durch ein gerades Segment (6) des elastischen Elements (3) miteinander verbunden sind, sodass die relative Position zwischen beiden Enden (5a, 5b) immer fixiert ist, und dass jedes elastische Element (3) mit entsprechenden vertikalen Verlängerungen (7) verbunden ist, die an diametral gegenüberliegenden Seiten der Haltevorrichtung (1) angeordnet sind, wobei das gerade Segment (6) und die Enden (5a, 5b) jedes elastischen Elements (3) jeweils angrenzend an einer der vertikalen Verlängerungen (7) positioniert sind.

2. Eine Haltevorrichtung (1) und eine Vorrichtung (2) zur Sicherung der Haltevorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das äußere gekrümmte Teil (5) ein Band aus einem elastischen Material umfasst.

3. Eine Haltevorrichtung (1) und eine Vorrichtung (2) zur Sicherung der Haltevorrichtung (1) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** eine Linie, welche die beiden Enden (5a, 5b) des äußeren gekrümmten Teils (5) verbindet, im Wesentlichen senkrecht zur Ebene der Öffnung (11) ist, wenn die Haltevorrichtung (1) in die Öffnung (11) eingeführt wird.

4. Eine Haltevorrichtung (1) und eine Vorrichtung (2) zur Sicherung der Haltevorrichtung (1) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das elastische Element (3) im Wesentlichen D-förmig ist.

5. Eine Haltevorrichtung (1) und eine Vorrichtung (2) zur Sicherung der Haltevorrichtung (1) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Haltevorrichtung ein Beleuchtungskörper (1) ist.

## Revendications

1. Un appareil (1) et un dispositif (2) pour fixer l'appareil (1), comprenant des moyens de fixation pour fixer l'appareil (1) à une ouverture (11) sur un élément de panneau (10), lesdits moyens de fixation comprenant deux éléments élastiques (3) associés à l'appareil (1), chaque élément élastique (3) comprenant une partie externe incurvée (5) comportant un état étendu de repos et qui est comprimée élastiquement par l'ouverture (11) lorsque l'appareil (1) est inséré dans ladite ouverture (11), la partie externe incurvée (5) récupérant son état étendu de repos après être passée à travers l'ouverture (11) et retenant l'appareil dans l'élément de panneau (10), **caractérisés en ce que** les deux extrémités (5a, 5b) de la partie externe incurvée (5) sont raccordées l'une à l'autre par la partie externe incurvée (5) elle-même et par un segment droit (6) de l'élément élastique (3), pour que la position relative entre les deux extrémités (5a, 5b) soit toujours fixe, et **en ce que** chaque élément élastique (3) est attaché à des extensions verticales respectives (7) situées sur les côtés diamétralement opposés de l'appareil (1), le segment droit (6) et les extrémités (5a, 5b) de chaque élément élastique (3) étant adjacents à chaque extension verticale respective (7).

2. Un appareil (1) et un dispositif (2) pour fixer l'appareil (1) selon la revendication 1, **caractérisés en ce que** la partie externe incurvée (5) comprend une bande de matériau élastique.

3. Un appareil (1) et un dispositif (2) pour fixer l'appareil (1) selon n'importe laquelle des revendications précédentes, **caractérisés en ce qu'**une ligne reliant les deux extrémités (5a, 5b) de la partie externe incurvée (5) est substantiellement perpendiculaire au plan de l'ouverture (11) lorsque l'appareil (1) est inséré dans l'ouverture (11).

4. Un appareil (1) et un dispositif (2) pour fixer l'appareil (1) selon n'importe laquelle des revendications précédentes, **caractérisés en ce que** l'élément élastique (3) est substantiellement en forme de D.

5. Un appareil (1) et un dispositif (2) pour fixer l'appareil (1) selon n'importe laquelle des revendications précédentes, **caractérisés en ce que** l'appareil est un appareil d'éclairage (1).

Fig.1

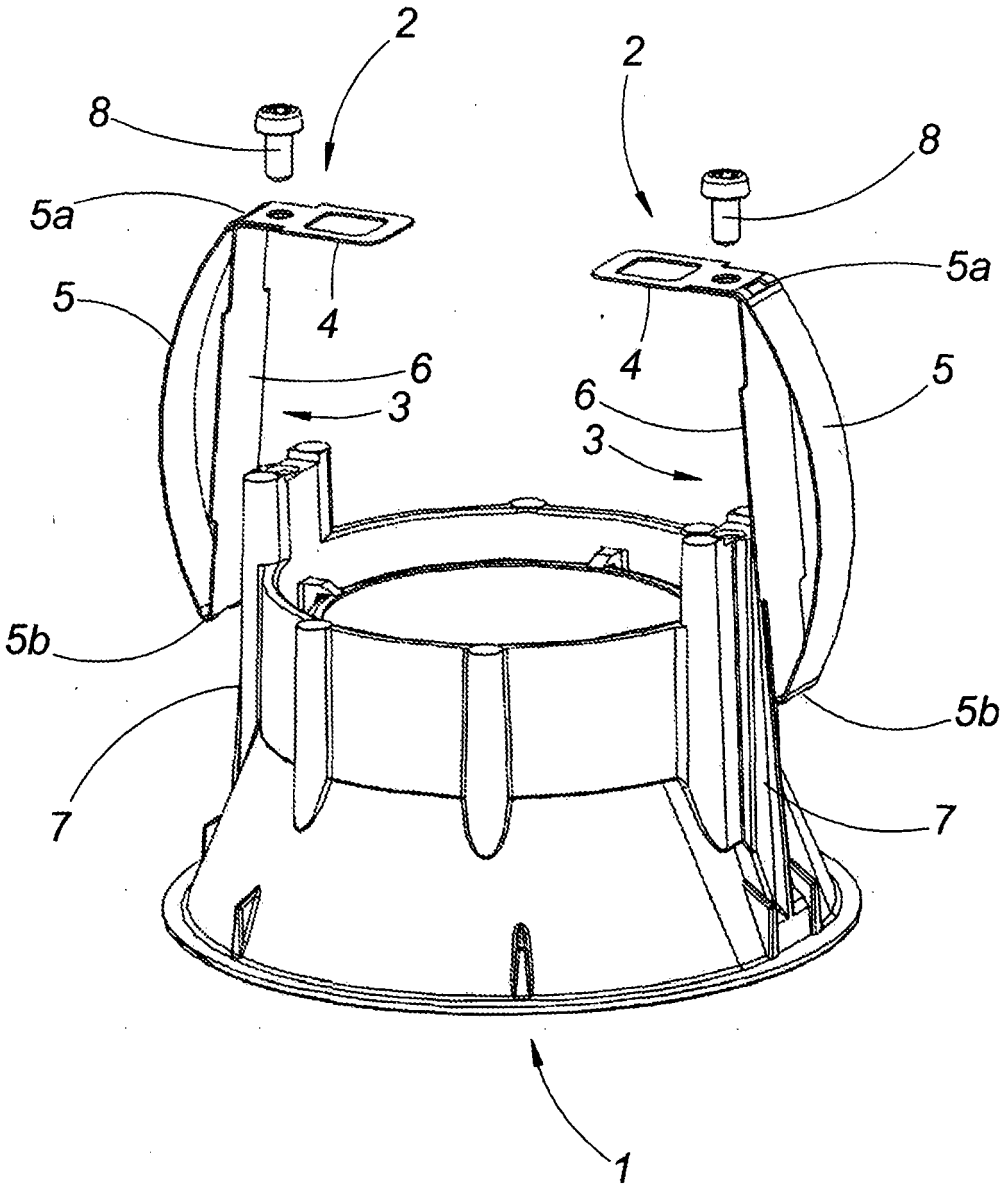


Fig.2

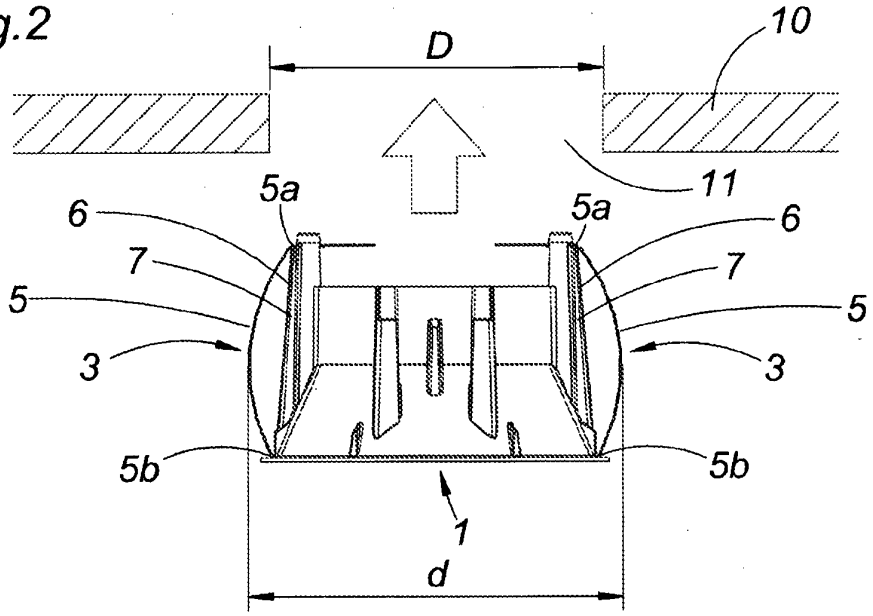



Fig.3

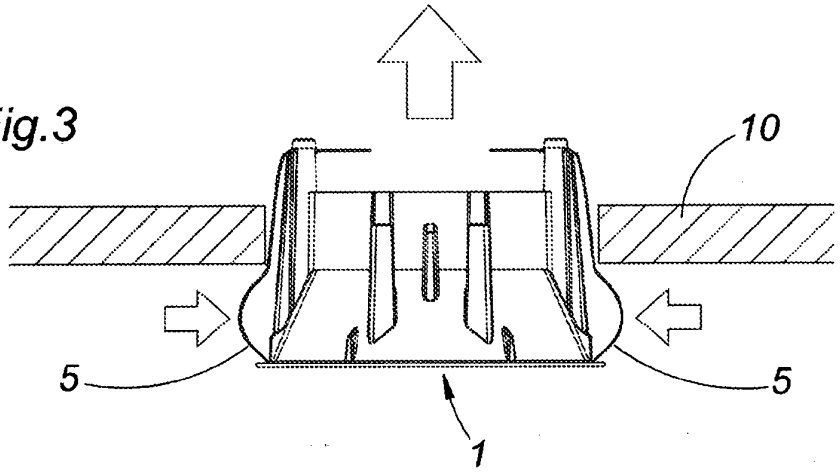
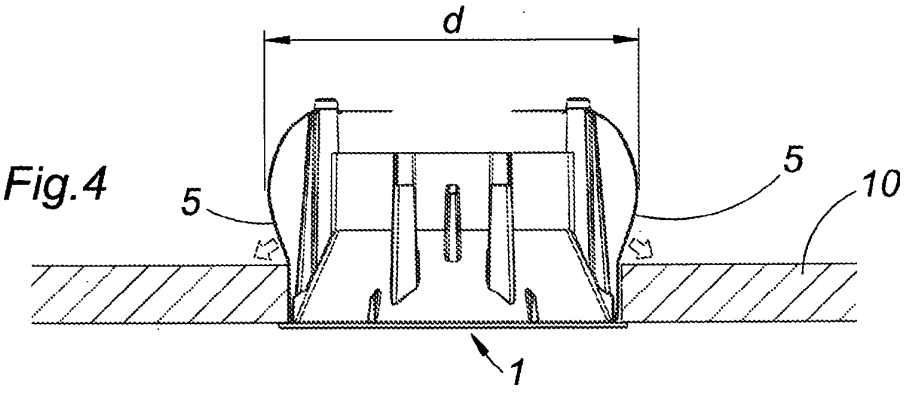



Fig.4



## REFERENCES CITED IN THE DESCRIPTION

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

### Patent documents cited in the description


- US 5068772 A **[0012]**