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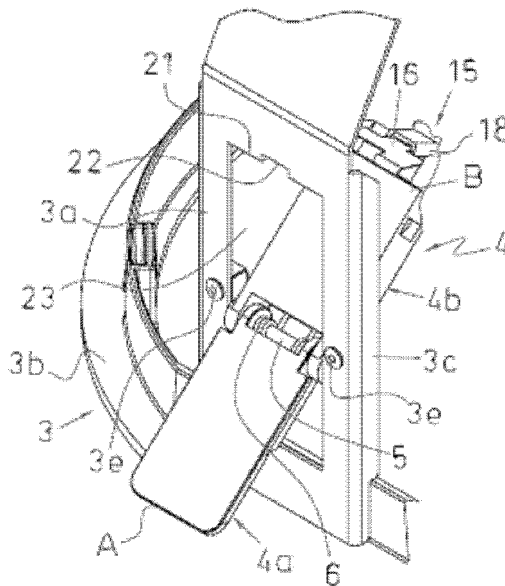
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(54) **DEVICE FOR INSTALLING FLUSH-FIT LIGHT FITTINGS INTO A SURFACE**

(57) It comprises at least a blocking element (4) with a first end (A) associated with the surface into which the light fitting is to be built (1) and a second end (B) associated with the light fitting (3). The blocking element (4) comprises two pieces (4a, 4b) that can turn with respect to each other against the action of a torsion spring (6)

around a shaft (5) mounted in the structure of the light fitting (3). On one end of one of the elements (4b) fixing means (15) for fixing to the structure of the light fitting (3) are mounted. In a mounting position, the blocking element (4) remains with one piece (4a) supported against said surface (1), and with the other piece fixed in the structure of the light fitting (3).

FIG. 9



Description

Field of the Invention

[0001] The present invention relates to a device for the installation of light fittings that can be built into a surface, for example a false roof or a similar structure.

[0002] The device includes at least one blocking element that presents a first end (such as the lower end), associated with the surface where the light fitting will be mounted, and a second end (such as the upper end), that is associated with the structure of the light fitting.

Prior Art of the Invention

[0003] There are numerous solutions in the field of illumination for the fixing in position of light fittings built into a surface, such as a similar false roof.

[0004] Therefore, in many of said known solutions, the blocking element intended to hold the light fitting in position with respect to the surface is a torsion spring, as illustrated in the documents ES2080347; ES1003809; ES1036203; ES1019478; ES1036340; ES1060966U, ES1038590U, ES1026698U, US4872096 and US4614997. In the majority of these previous solutions, the spring acts on the surface and on the light fitting itself. In other alternative solutions, the torsion spring can act indirectly on a clamp, as illustrated in the utility models ES100603U and ES1011601 U. In other cases, the blocking element can be an elastic strip, as disclosed in the documents ES1017711 and FR1304849.

[0005] However, the mounting of the present built-in light fittings requires an extensive installation time and is often inconvenient due to poor accessibility to the interior of the surface, in some cases, therefore a tool suitable for installation is required. Furthermore, the majority of anchoring mechanisms for the current built-in light fittings fail to provide removal means.

Description of the Invention

[0006] The present invention proposes a device for the installation of light fittings built into a surface, such as a false roof, with which the mounting operation is very easy. As will be seen hereinafter, it is sufficient to push a blocking element with one finger in order to fix the light fitting in position in the surface where it must be installed without having to use a tool for installation. Furthermore, the invention device presents the additional advantage of allowing the removal of the light fitting from said surface in a quick and simple way.

[0007] According to the invention, the blocking element of the device for the installation of built-in lights is made up of two pieces that can turn with respect to each other. In particular, it concerns a first piece that includes a first end and a second piece that includes a second end, opposite said first end. These two pieces, as indicated, can turn with respect to each other (and with re-

spect to the structure of the light fitting) against the action of elastic means, which can be, for example, a torsion spring. The relative turning of both elements can be carried out around a shaft mounted in the structure of the light fitting.

[0008] The second end of the blocking element is equipped with fixing means. These fixing means have the aim of coupling the second piece of the blocking element to the structure of the light fitting, as will be described hereinafter. In this way, when the light fitting is installed and held in position in the surface, the blocking element remains supported with the first piece against said surface and the second piece is fixed in the structure of the light, thus holding the light assembly in position.

[0009] In one embodiment of the invention, the means for fixing the light fitting to said second end of the blocking element comprise a substantially flexible holding element intended to remain blocked in the structure of the light fitting. Provision is made for said fixing means also to include a release tongue integral with said holding element intended to facilitate the detachment of the structure of the light fitting.

[0010] One area of said second end of the blocking element, adjacent to said holding element, can present a relief intended to facilitate the fixing of the holding element in the structure of the light fitting by means of pressure exerted by the operator on said area, without the need for a tool for installation.

[0011] A device for the installation of light fittings built into a surface in accordance with the present invention allows the easy installation of the light fitting in said surface, guaranteeing its effective blocking in position with respect to the surface into which it is to be placed. Furthermore, the device of the invention, as described, allows the detachment of the light fitting quickly and simply without requiring any extra time. These advantages also positively influence the final cost of the installation.

[0012] Other objectives, advantages and characteristics of the device for the installation of built-in light fittings of the invention will be clear from the description of the invention of a preferred embodiment. This description is given as a non-limitative example and is illustrated in the drawings annexed to the present memory.

Brief Description of the Drawings

[0013] In said drawings,

Figure 1 is a rear elevated view of the blocking element of an embodiment of a device for the installation of light fittings that can be built into a surface in accordance with the invention;

Figure 2 is a lateral elevated view of the blocking element in Figure 1;

Figure 3 is a frontal elevated view of the blocking element in said Figure 1;

Figures 4 and 5 are perspective views, from different angles, of the blocking element of the device of the invention;

Figure 6 is a plan view of the blocking element where the means for fixing the second end to the structure of the light fitting are shown;

Figure 7 is an exploded view in perspective of the blocking element in Figures 1-5;

Figure 8 is an exploded view in perspective of the device for the installation of built-in light fittings of the invention in which the dismantled blocking element of the structure of the light fitting is illustrated;

Figure 9 is a view in perspective that illustrates the device of the invention with the blocking element arranged in the structure of the light fitting and in a position in which the light fitting has not yet been blocked on the surface;

Figures 10-12 are partial elevated views in section that illustrate the mounting sequence of a built-in light fitting in a false roof using the device of the present invention; and

Figures 13-15 are partial perspective views in section that illustrate the mounting sequence of the built-in light fitting according to Figures 10-12.

Detailed Description of a Preferred Embodiment

[0014] In the annexed Figures, a possible embodiment example of a device in accordance with the invention is illustrated. The device that is described with reference to the Figures is intended for the installation of light fittings that can be built into any suitable surface that allows the coupling of a light fitting in such a way that it remains built into the interior of the surface, for example a false roof. The device of the invention serves the function of holding the light fitting in position in said surface when it has been installed. Said surface (see Figures 10 to 15 of the drawings) has been designated in the drawings with the number 1 and in the description that is in accordance with the example shown, reference will also be made to said surface as the false roof.

[0015] The surface 1 where the light fitting is to be built in has an opening 2 to allow the light fitting with its structure 3 to pass through it. Said structure 3 of the light fitting, that can clearly be seen in Figures 8 and 9 of the drawings, includes a casing on which the components of the light fitting itself are mounted, made up of a frame 3b that, in the mounting position (as shown in Figures 12 and 15) remains supported on the lower face of the surface 1 where the light fitting is built in. With reference to Figures 8 and 9 of the drawings, the structure of the light fitting 3 also includes support elements 3c (also as de-

vices in accordance with the invention). These support elements 3c are defined by U-shaped structures (see in particular Figure 8) whose arms include respective notches 3d that receive rivets 3e by screw threading that cross corresponding orifices 3f formed in a support bridge 3a for its coupling to the structure of the light fitting 3. This support bridge 3a presents a rectangular central opening 23 with an upper edge 21 provided with a central rectangular indentation 22.

[0016] In the notches 3d of each support element 3c are housed the ends of a shaft 5 that supports in a rotary way a blocking element 4 that forms part of the device of the invention and an exploded view of which is illustrated in Figure 7. As can be seen in the Figures, the blocking element 4 consists of two pieces: a first piece 4a and a second piece 4b. Both pieces 4a, 4b of the blocking element 4 can turn with respect to each other, and also with respect to the structure 3 of the light fitting, around said shaft 5 mounted, as indicated, on the structure 3, on said support elements 3c.

[0017] The relative turning of the two pieces 4a, 4b of the blocking element 4 is executed against the action of elastic means. In the embodiment shown in the Figures, the elastic means are made up of a torsion spring 6 made in steel wire. This torsion spring 6 is defined by a pair of spirals 6a and 6b, as can be seen in Figure 7, wound around said shaft 5 of the blocking element 4. The respective ends of the spirals 6a and 6b extend in corresponding substantially parallel sections 6c, 6d that project outwards. The opposite ends of said spirals 6a, 6b remain joined in the form of a bridge 6e, which extends opposite said substantially parallel sections 6c, 6d, as illustrated in Figure 7. The bridge 6e of the spring 6 acts against the first piece 4a, while the substantially parallel sections 6c, 6d of said spring 6 act against the second piece 4b. This action tends to maintain both elements in a position aligned with each other, as illustrated in Figures 1 to 6 of the drawings.

[0018] The first piece 4a includes a first end A and is arranged, in the blocked position, on the lower part of the blocking element 4. As can be seen in the exploded view in Figure 7 of the drawings, the first piece 4a includes a hollow casing that, in its upper part disposes of two cylindrical bodies 7,8 provided respectively with a through orifice 9,10. The orifices 9,10 are aligned with each other so that the shaft 5 passes through them.

[0019] The second piece 4b includes a second end B, opposite said first end A of the first piece 4a, and is arranged, in the blocking position, in the upper part of the blocking element 4. This second piece 4b also comprises a hollow casing that, on its lower part has two cylindrical bodies 11,12 provided respectively with a through orifice 13,14. In the mounting position, the cylindrical bodies 7,8 of this second piece 4b remain aligned with the cylindrical bodies 11,12 of the first piece 4a through whose respective orifices 9,10,13,14 the shaft 5 passes and remains with its ends housed in the notches 3d of the support elements 3c of the frame of the light fitting 3b. In this way

both elements 4a, 4b remain joined to each other with the possibility of relative turning and also with the possibility of turning with respect to the support bridge 3a.

[0020] Once the light fitting has been installed, in order to maintain the mounting position shown in Figures 12 and 15 of the drawings, fixing means 15 are provided that are located on the second piece 4b, on the second end B. The fixing means 15, that can be seen with greater clarity in Figures 7, 8 and 9, have the aim of blocking the second piece 4b of the blocking element 4 in the structure 3 of the light fitting, in particular in the support bridge 3a, in the way described later. In said mounting position (Figures 12 and 15 of the drawings), the blocking element 4 remains with the first piece 4a supported against the internal part of the surface of the false roof 1, while the second piece 4b remains fixed on the support bridge 3a of the structure 3 of the light fitting.

[0021] In the following the configuration of the fixing means 15 is described with particular reference being made to Figures 6 and 7 of the drawings. The means for fixing the blocking element to the light fitting 15 comprise a holding element 16 intended to connect to the second piece 4b of the blocking element 4. Said holding element 16 is made up of one piece in the form of a flexible strip that presents a lower area 16a and an upper area 16b. The lower area 16a of the holding element 16 is defined by a flat rectangular plate that is equipped with two lateral tongues 16a', 16a" intended to facilitate the insertion and the blocking of the holding element 16 in the second piece 4b of the blocking element 4.

[0022] The lower area 16a of the holding element 16 extends to an upper area 16b defined by a substantially V-shaped folded foil that projects from the surface of the lower area 16a. One end of this upper area 16b of the holding element 16 is subsequently extended to a release tongue 17. This release tongue 17, integral with said holding element 16, is adapted to receive a cap 18 formed by a hollow piece with a substantially prismatic shape equipped with a projection 19 on its free end.

[0023] In the fixing position of the blocking element 4 in the structure 3 of the light fitting, the upper area 16b of the holding element 16 is fitted into the interior part of the upper edge 21 of the rectangular opening 23 of the support bridge 3a. In said position, the tongue 17 of the holding element 16 is fitted into the rectangular indentation 22 of said upper edge 21.

[0024] In the embodiment shown in the Figures, the second piece 4b of the blocking element 4 presents in its rear upper part, adjacent to the holding element 16, a relief area 20 intended to facilitate actuation, by the operator, of the piece 4b for insertion of the holding element 16 in the rectangular indentation 22 of the edge 21 of the structure of the light fitting 3. Said insertion of the holding element 16 in the indentation 22 in order to fix the blocking element in the structure 3 of the light fitting is carried out simply by pushing the blocking element 4 with the finger on said relief area 20 towards the support bridge 3a, as detailed in the following with reference to the functioning

of the device of the invention.

[0025] In order to install the light fitting with the device that is described, first the blocking element 4 is placed in alignment with the support bridge 3a of the structure 3 of the light fitting, making it turn according to the arrow 24 shown in Figures 10 and 13. As can be seen in Figures 10 and 13 of the drawings, this alignment, that prevents the blocking element 4 from projecting from the structure 3 of the light fitting, allows the introduction of the light fitting by pushing upwards through the opening 2 of the false roof 1 according to the vertical arrow 25 of Figures 10 and 13.

[0026] In accordance with Figures 11 and 14 of the drawings, subsequently the blocking element 4 is additionally made to turn according to the arrow 26 by pushing the second piece 4b against the torsion spring 6, in such a way that the first piece 4a remains supported with its first end A on the interior part (not visible) of the surface 1 of the false roof.

[0027] Finally, as illustrated in Figures 12 and 15, the holding element 16 is fitted into the upper edge 21 of the opening 23 of the support bridge 3a making it turn by exerting pressure on the relief area 20 of the second piece 4b. In this fixing position of the blocking element 4 in the structure of the light fitting 3, the tongue 17 of the holding element 16 is inserted into the indentation 22 of the edge 21 of the support bridge 3a. This produces the blocking in position of the second piece 4b, with the first piece 4a exerting pressure on the interior part of the surface 1 of the false roof, and consequently the light fitting and its structure 3 are held in position.

[0028] In order to detach the light fitting, it is sufficient to carry out the steps described in the inverse order, namely beginning with the actuation on the release tongue 17, exerting pressure on the cap 18 downwards, to cause the detachment of the holding element 16 of the structure 3 of the light fitting. This allows the turning of the entire blocking element 4 according to Figures 10 and 13 until aligning with the support bridge 3a in order to be able to extract the light from the false roof 1 across the opening 2 of said roof.

[0029] It is obvious that another device can be mounted in an opposite diametral position or, if desired, many of said devices can be mounted in different positions in the structure 3 of the light fitting. In any case, the light fitting is fitted perfectly into the opening 2 of the surface 1 into which it is to be placed, with an extremely convenient, simple and rapid installation process.

[0030] Although the present invention has been described in the memory and has been illustrated in the annexed drawings with reference to a preferred embodiment of the invention, the device for the installation of light fittings that can be built in that is the object of the invention is susceptible to several changes without deviating from the scope of protection defined in the following claims.

Claims

1. Device for the installation of light fittings that can be built into a surface (1), said device comprising at least a blocking element (4) with a first end (A) associated with said surface (1) and a second end (B) associated with a structure (3) of the light fitting, **characterised in that** said blocking element (4) is made up of a first piece (4a) that includes said first end (A) and a second piece (4b) that includes said second end (B), both elements (4a, 4b) being able to turn with respect to each other against the action of elastic means, said second end (B) presenting fixing means (15) for fixing to the structure of the light fitting (3) so that, in a mounting position, said blocking element (4) remains with the first piece (4a) supported against said surface (1), and the second piece fixed in the structure of the light fitting (3).

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2. Device according to the claim 1, **characterised in that** it includes a shaft (5) mounted on said structure of the light fitting (3) around which both pieces (4a, 4b) of said blocking element (4) can turn.

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3. Device according to either of claims 1 or 2, **characterised in that** said elastic means comprise a torsion spring (6) that acts against the relative turning of said first and second pieces (4a, 4b), causing, in said mounting position, the support of the first piece (4a) on said surface (1).

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4. Device according to any of the previous claims, **characterised in that** the means for fixing (15) said second end (B) of the blocking element (4) to the light fitting comprise a holding element (16) intended to remain pressure fitted in such a way that it can be released from the structure of the light fitting (3).

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5. Device according to claim 4, **characterised in that** the fixing means (15) include a release tongue (17), integral with said holding element (16), intended to facilitate its detachment from the structure of the light fitting (3).

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6. Device according to any of the claims 4 or 5, **characterised in that** an area (20) of said second end (B) of the blocking element (4), adjacent to said holding element (16), presents a relief intended to facilitate the fixing of the holding element (16) in the structure of the light fitting (3).

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FIG. 1

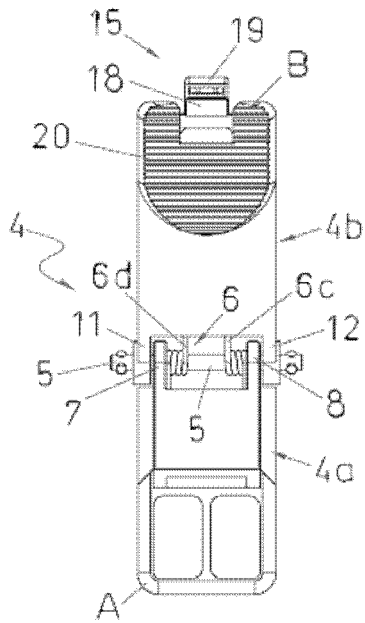


FIG. 2

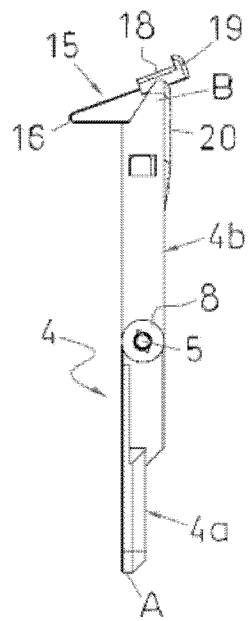


FIG. 3

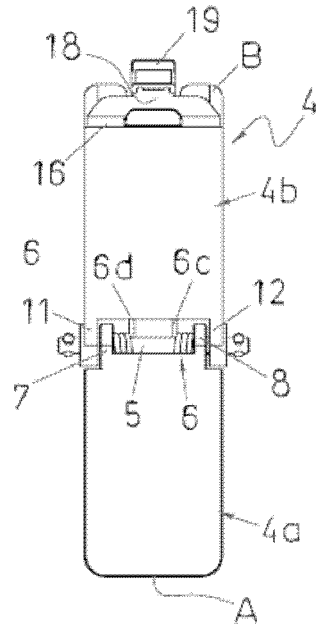


FIG. 4

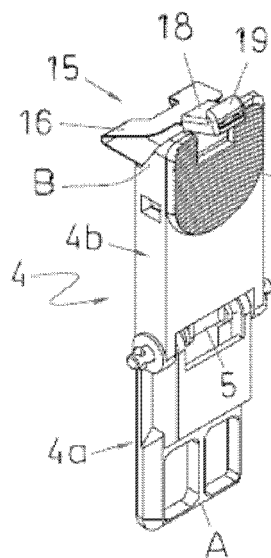


FIG. 5

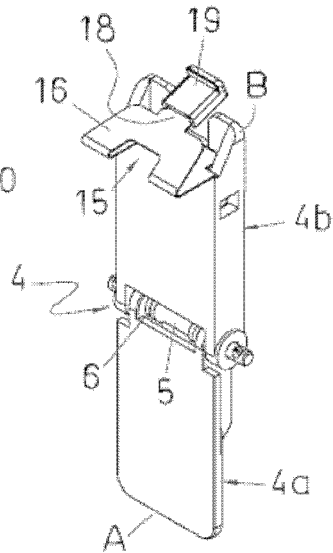
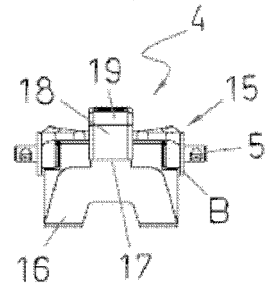


FIG. 6



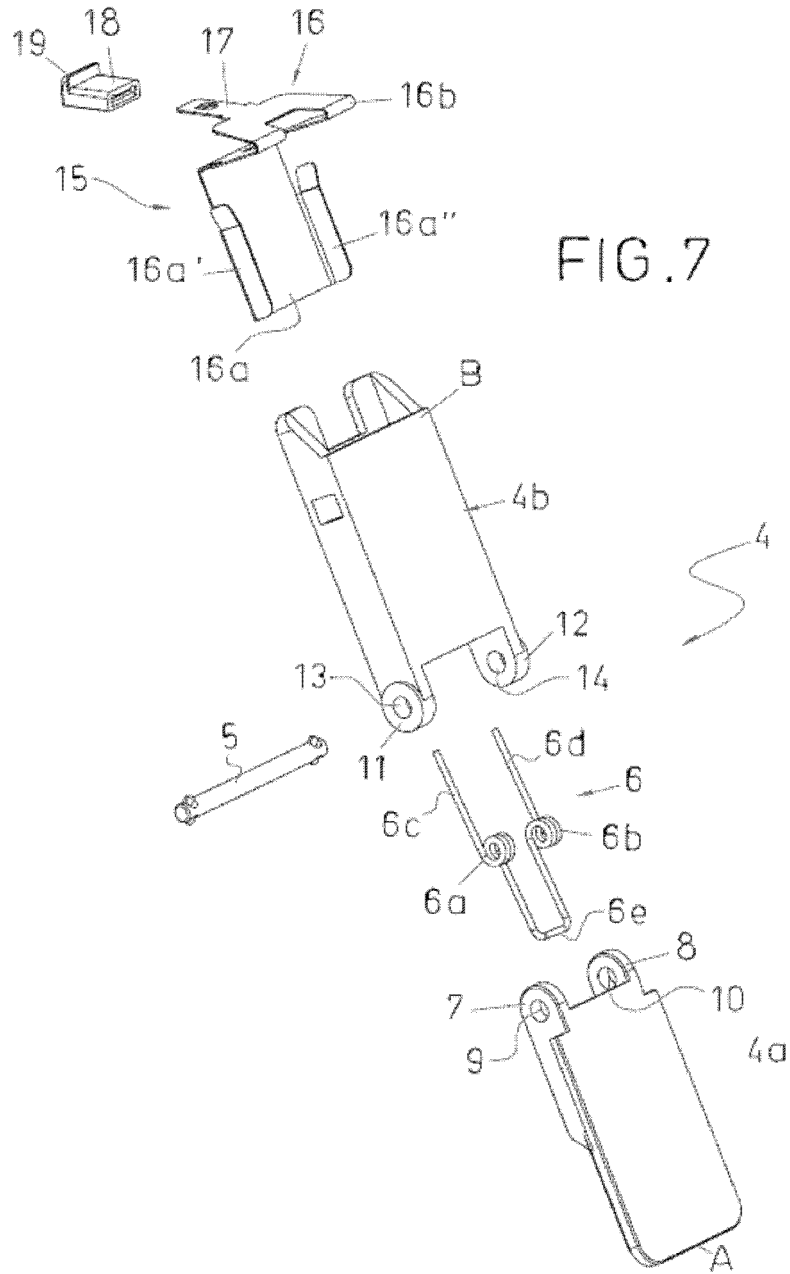


FIG. 8

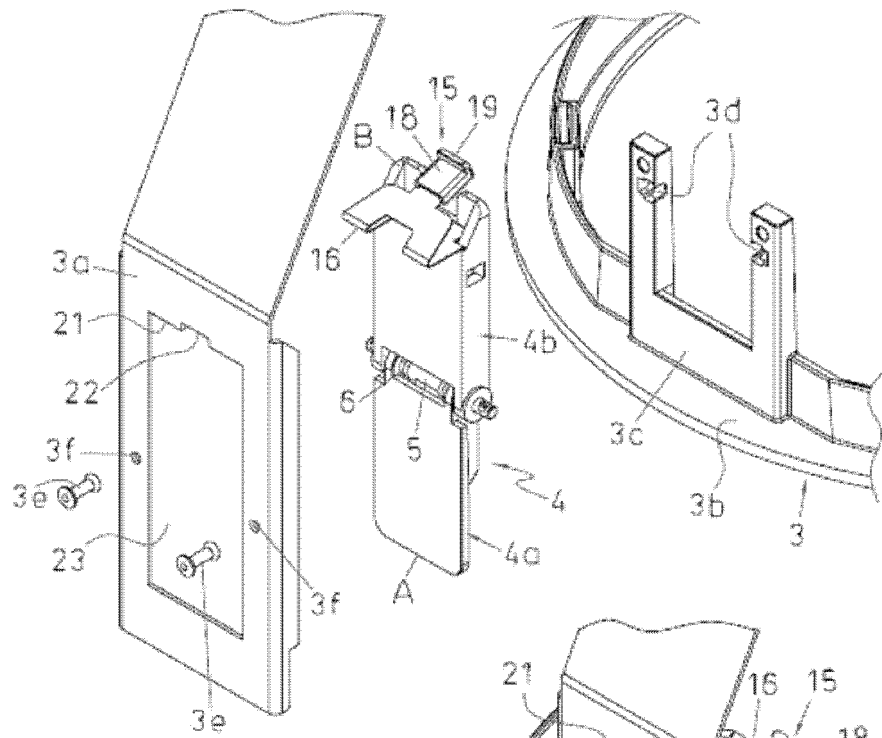


FIG. 9

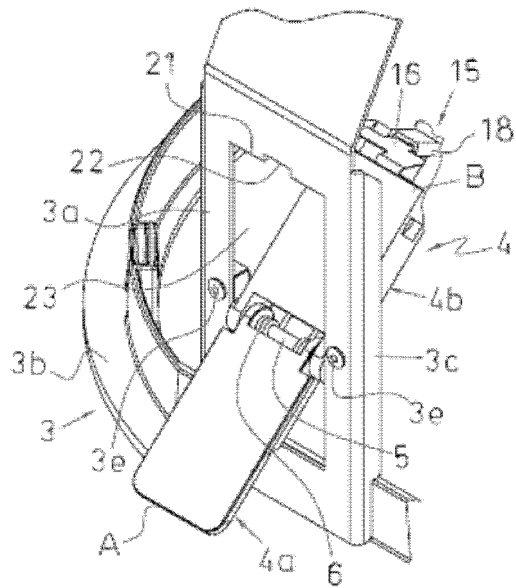


FIG.12

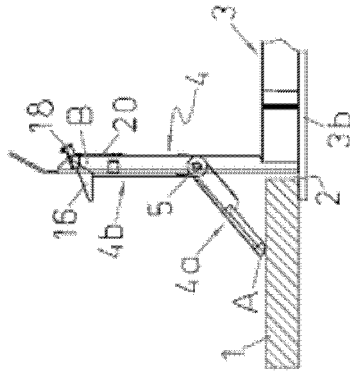


FIG.11

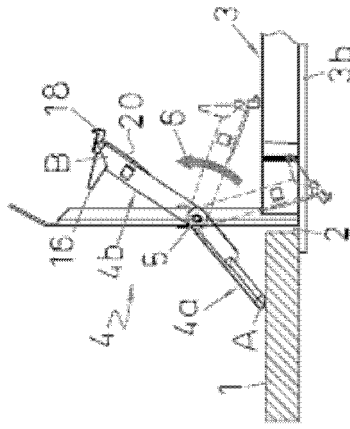


FIG.10

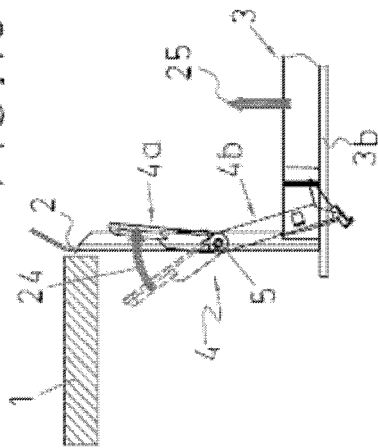


FIG.15

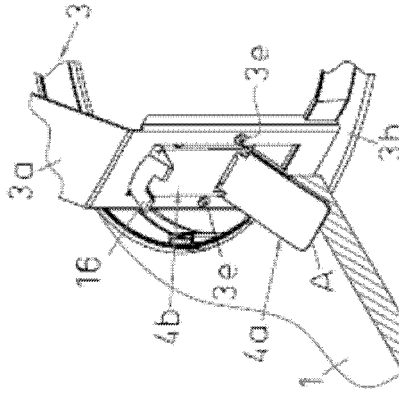


FIG.14

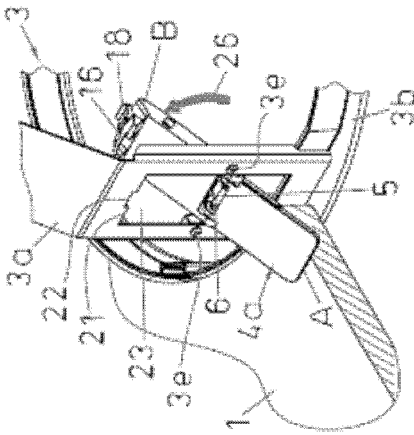
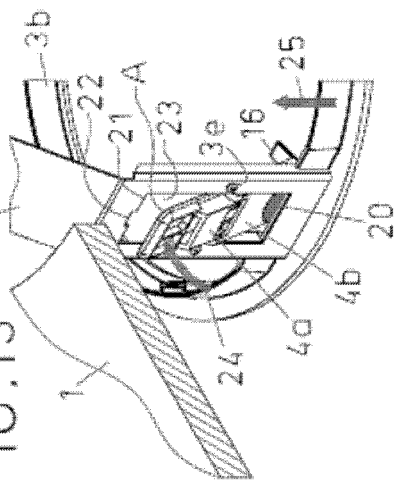


FIG.13



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2006/000104

A. CLASSIFICATION OF SUBJECT MATTER		
See additional sheet		
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, F21S		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CIBEPAT,EPODOC		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4250540 (KRISTOFEK, P.) 10.02.1981, column 3, línea 1 - column 4, línea 57; and figures.	1-6
A	US 4293895 (KRISTOFEK, P.) 06.10.1981, column 3, líne 6 - column 5, líne 22; figures 1-6.	1-6
E	US 6554458 (BENGHOZI, S.) 29.04.2003, The whole document	1-6
A	US 6000818 (CALUORI, G.) 14.12.1999, The whole document	1-6
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Date of the actual completion of the international search		Date of mailing of the international search report
05 JUN 2006 (05.06.2006)		07 AUG 2006 (07.08.2006)
Name and mailing address of the ISA/ S.P.T.O.		Authorized officer
Facsimile No.		Telephone No.

EP 1 936 265 A1

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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Form PCT/ISA/210 (patent family annex) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 2006/000104

CLASSIFICATION OF SUBJECT MATTER

F21V 21/04 (2006.01)

F21V 21/084 (2006.01)

REFERENCES CITED IN THE DESCRIPTION

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