(12) STANDARD PATENT (11) Application No. **AU 2006217815 B2**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Housing comprising an invisible stiffener

(51) International Patent Classification(s)
E04B 9/00 (2006.01) ***F21V 1/14*** (2006.01)
F21S 8/02 (2006.01)

(21) Application No: **2006217815** (22) Date of Filing: **2006.02.23**

(87) WIPO No: **WO06/090068**

(30) Priority Data

(31) Number	(32) Date	(33) Country
050 1947	**2005.02.25**	**FR**

(43) Publication Date: **2006.08.31**
(44) Accepted Journal Date: **2011.09.15**

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(56) Related Art
WO 1999/043907
DE 10253343
US 3720432
WO 2003/071182
DE 3834137
US 4910650

(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION EN MATIÈRE DE BREVETS (PCT)

(19) Organisation Mondiale de la Propriété Intellectuelle
Bureau international

(43) Date de la publication internationale
31 août 2006 (31.08.2006)

PCT

(10) Numéro de publication internationale
WO 2006/090068 A1

(51) Classification internationale des brevets :
E04B 9/00 (2006.01) *F21S 8/02* (2006.01)
F21V 1/14 (2006.01)

(21) Numéro de la demande internationale :
PCT/FR2006/000416

(22) Date de dépôt international :
23 février 2006 (23.02.2006)

(25) Langue de dépôt : français

(26) Langue de publication : français

(30) Données relatives à la priorité :
050 1947 25 février 2005 (25.02.2005) FR

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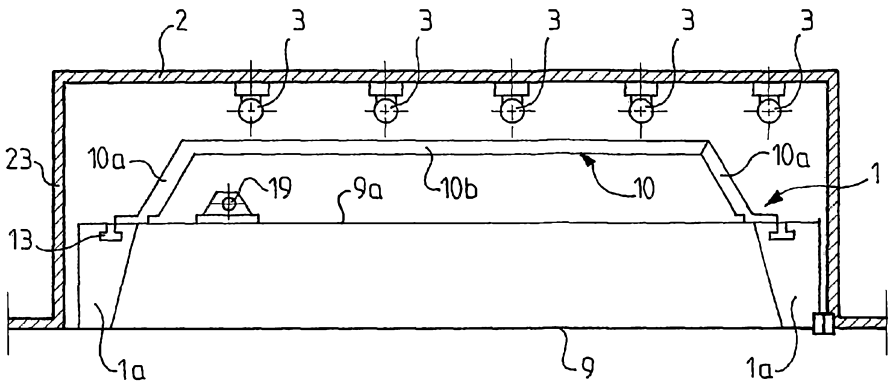
(81) États désignés *(sauf indication contraire, pour tout titre de protection nationale disponible)* : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) États désignés *(sauf indication contraire, pour tout titre de protection régionale disponible)* : ARIPO (BW, GH,

[Suite sur la page suivante]

(54) Title: HOUSING COMPRISING AN INVISIBLE STIFFENER

(54) Titre : CAISSON A RAIDISSEUR INVISIBLE



(57) Abstract: The invention relates to a light housing which, together with other same-type housings, is intended to form a lighting wall, such as a ceiling. The inventive housing comprises a frame having at least one transparent or translucent panel (9) fixed to the base thereof and can receive lighting means (3) which are disposed above said frame. The light housing is characterised in that it comprises stiffening means (10, 10') which provide a link between certain sides (1a) of the frame, said stiffening means (10) being disposed close to the above-mentioned lighting means (3).

(57) Abrégé : La présente invention concerne un caisson lumineux destiné, notamment en association avec d'autres caissons du même type, à constituer une paroi lumineuse telle que par exemple un plafond, ce caisson étant constitué d'un cadre à la base duquel est fixée au moins une nappe transparente ou translucide (9), et apte à recevoir des moyens d'éclairage (3) disposés au-dessus dudit cadre. Ce caisson lumineux est caractérisé en ce qu' il comporte des moyens raidisseurs (10,10') assurant

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GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), eurasien (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), européen (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Publiée :

— *avec rapport de recherche internationale*

En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

la liaison entre eux de certains des côtés (la) dudit cadre, ces moyens raidisseurs (10) étant disposés à proximité des moyens d'éclairage (3).

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HOUSING COMPRISING AN INVISIBLE STIFFENER

This present invention concerns a light box.

It is known that light boxes of this type, when they are of small size, are sufficiently rigid to allow a user to handle them with no risk that they will suffer irreversible damage. Regrettably, the same cannot be said when the dimensions of these light boxes exceed certain limits, in which case one is obliged to reinforce them with stiffening elements. The latter are usually composed of transverse bars, making a connection in particular between two respective opposite sides of the light box, which lie more-or-less in the plane of the upper face of the latter, between the translucent sheet and the lighting means, so that the latter project shadows onto the translucent sheet, so that this shadow is visible to the occupants in the location.

It would be advantageous to provide a means which can be used to make up a stiffened light box that generates no shadow on the translucent sheet.

It has also been observed that the light boxes of this type all present, to various degrees, problems regarding servicing and maintenance of the lighting elements with which they are associated, in particular because of the fixing means with which they are fitted.

One is familiar therefore with light boxes that are held to the ceiling by screws placed around their periphery, so that one is obliged to execute a veritable dismantling operation in order to gain access to the translucent sheet and to the lighting means, followed by a re-fitting operation after maintenance work has been completed.

Some light boxes are also positioned so that they rest upon longitudinal and transverse supports held at a distance from the ceiling by tie-rods. It can be seen that in these conditions, maintenance on such light boxes is a difficult operation because of the complexity of executing the removal and refitting operations.

It would therefore be advantageous to provide a light box that enables virtually immediate access for a user to its internal

volume, thus enabling easy and rapid maintenance both of the internal face of the translucent sheet and the lighting means.

The subject of this present invention is therefore a light box that is intended, in particular in association with other light boxes of the same type, to constitute a luminous wall, such as a ceiling for example, where this light box is composed of a frame with a base, at least one transparent or translucent sheet fixed on at the base of the frame, stiffening means to provide a connection between some of the sides of the frame and lighting means, wherein the frame and the stiffening means are located below the lighting means, with these stiffening means located close to the lighting means, the stiffening means extends between the opposite sides of the frame at a position located vertically between the transparent or translucent sheet and the lighting means, the stiffening means extends across a lighting path of the lighting means at the position located vertically between the transparent or translucent sheet and the lighting means, and a central part of the stiffening means is located within the lighting path of the lighting means at a first vertical distance above the transparent or translucent sheet, and at a second vertical distance below the lighting means such that, with the lighting means lighting the transparent or translucent sheet, the lighting means does not project a shadow of the stiffening element onto the inner face of the sheet.

Described herein are light boxes of the type that is composed of an extruded channel element which is cut and assembled in the form of a frame, at the base of which is fixed a translucent sheet, with this light box being in particular intended to be placed alongside light boxes of the same type, so as to constitute a lighting matrix.

For example, the stiffening means can be composed of at least one stringer or length element joining together two opposite sides of the frame. These stiffening means, in particular when the lighting means are composed of tubes placed parallel to each other, more-or-less in the same plane, can be placed more-or-less in this same plane and preferably between two adjacent tubes.

The frame forming the basic structure of the light box of the invention can advantageously be formed by the association of sections created from an extruded channel element.

In order to allow both the sliding of the light box and its rotation in relation to the ceiling, the upper face of at least two opposite sides of the frame will be hollowed out with a groove that is designed to receive, by sliding action, a sliding element that is articulated so as to rotate on a part that is attached to a support structure, and the ceiling in particular.

A description will now be given, by way of a non-limiting example, of one form of execution of this present invention, with reference to the appended drawing, in which:

- Figure 1 is a view in vertical section of one method of implementation of a light box of the invention, shown in the closed or working position.

- Figure 2 is a view in vertical section of the light box shown in figure 1, in the open or maintenance position.

- Figure 3 is a partial view of the lower part of a light box of the type shown in figures 1 and 2.

- Figure 4 is a partial view of the sliding and articulation means of the light box shown in the previous figures.

- Figures 5 and 6 are partial views in vertical section of two implementation variants of the invention.

- Figure 7 is another variant in which the light box is of greater height, and the stiffening means are located in the upper plane of the latter.

- Figure 8 is a partial view in vertical section of a variant of the sliding and articulation means of the light box shown in figure 4.

Figures 1 to 3 show a light box 1 according to the invention, which is positioned below a ceiling 2 on which are placed lighting means composed of parallel discharge tubes 3 for example. The light box 1, which is of parallelepiped form, is composed of the association of four extruded channel elements 1_a that form each of its sides, and that end in 90° mitre cuts connected by brackets that are not shown on the drawing. The lower part of the extruded channel, forming each of the sides, end in two parallel wings 4 and 5 extending downwards, and in which the inner face of the external wing 4 is equipped with a transverse stop element 6 intended to act as a simple support for one end of an edge element 7, placed on the periphery of translucent stretched sheet element 9 forming the bottom of the light box.

The latter is fitted with a stiffening element 10 joining two opposite sides 1_a of the frame.

This stiffening element 10 is composed of a central part 10_b that is parallel to the bottom of the light box 1 composed of the stretched sheet element 9, and two end parts 10_a which are used to distance the central part 10_b from the frame and to place it close to lighting means 3. It can then be seen that when the central part 10_b of the stiffener 10 is located firstly at a distance from the entry face 9_a of the light box, meaning from the large face of the latter opposite to the sheet, and secondly close to the lighting elements 3, the latter does not project a shadow of the stiffening element 10 onto the inner face of the translucent sheet element 9 forming the bottom of the light box.

Furthermore, and in order to facilitate the maintenance operations, both on the inner face of the stretched sheet element (cleaning) and on the lighting means (cleaning and changing the fluorescent tubes), the light box of the invention is mounted to pivot around an axis located parallel

to one of its sides. Advantageously, to this end, as shown in figure 4, the top edge 8 of each of the extruded channel elements 1_a forming the sides of the light box is hollowed out into a groove 13 in the shape of an inverter T, which allows a sliding element 15 to slide in the latter. The light box of the invention is thus fitted respectively with two sliding elements placed in the top grooves of two opposite sides which are attached to the respective upper parts of a wing 17a belonging to a retention element 17 in the form of a bracket whose other wing 17b is traversed by a bolt 19 fixed into a side wall 21, with the interposition of a washer 22. In these conditions, it can be seen that the user has the ability to pivot the light box around the securing bolt 19 and, in order to allow the release of the latter when, as shown in figures 1 and 2, it is enclosed in enclosure elements 23, he is able to slide it on the sliding element 15 hinged around the retention bolt 19.

As shown in figure 5, in a particularly useful variant of the invention, the stiffening element can be placed parallel to the lighting tubes 3 and can even be placed between the latter.

Naturally, it is possible on a given light box, and in particular when the latter is of substantial dimensions, to make use of several stiffening elements and in particular of two perpendiculars stiffening elements 10, 10' as shown in figure 5.

In particular, the light box of the invention is intended to be fitted into a enclosure element 23. In such a method of implementation, the light box is usually held in its working position at four points. Two securing points are composed of the two bolts 19 and the sliding element 15, and the two other are composed of fixing latches formed from two elements 20a,

20b attached to the light box 1 and the enclosure element 23 respectively.

The light box also includes means that are used to secure it in an inclined position, as shown in figure 2, if the user so wishes. For example, these means can be composed simply of a flexible wire 25, a strap or a small chain, one end of which is fixed onto one end of element 10b, for example, and the other end on the enclosure element 23. These retention means are particularly useful, in that they constitute a means to ensure the safety of the user while opening the unit.

According to the invention, it is naturally possible to have several transparent and/or translucent sheets in the light box. Thus, in the method of implementation shown in figure 6, a light box 1 contains a first translucent sheet 9 at a distance "e" from the base of the latter, and a second transparent sheet 9' at a distance "E" above the first. In this implementation, the role of the upper sheet 9' is to protect the lower sheet 9 against any dust and insects that may be deposited on the latter and that may be visible to the occupants of the illuminated area. Sheets 9 and 9' can be secured by any means available and in particular by a spots of glue or spot welds 24 positioned around the periphery of the latter.

Preferably, the lighting means will be set away from the most distance sheet to leave a gap of at least ten centimetres.

Naturally, when the height of the light box is sufficient, as shown in figure 7, the stiffening means 10 can be placed in the plane of the upper part of the light box.

Furthermore, in order to improve the sliding action of the light box in relation to the housing, so as to facilitate the execution of maintenance operations, the latter can be equipped with rollers. As shown in figure 8, the extruded

channel 1_a from which the sides of the light box 1 are formed is hollowed out into a longitudinal groove 13' which is used to accommodate a roller 16 with a horizontal axis xx' around which a shaft 26, fixed to a side wall 21, is mounted to rotate.

Naturally, according to the invention, the groove could be replaced by a slide fixed on two opposite sides of the light box, either at the top or the sides of the latter.

In the claims which follow and in the preceding description of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

It is to be understood that, if any prior art publication is referred to herein, such reference does not constitute an admission that the publication forms a part of the common general knowledge in the art, in Australia or any other country.

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CLAIMS

1. A light box that is intended, in particular in association with other light boxes of the same type, to constitute a luminous wall, such as a ceiling for example, where this light box is composed of a frame with a base, at least one transparent or translucent sheet fixed at the base of the frame, stiffening means to provide a connection between some of the sides of the frame and lighting means, wherein the frame and the stiffening means are located below the lighting means, with these stiffening means located close to the lighting means, the stiffening means extends between the opposite sides of the frame at a position located vertically between the transparent or translucent sheet and the lighting means, the stiffening means extends across a lighting path of the lighting means at the position located vertically between the transparent or translucent sheet and the lighting means, and a central part of the stiffening means is located within the lighting path of the lighting means at a first vertical distance above the transparent or translucent sheet, and at a second vertical distance below the lighting means such that, with the lighting means lighting the transparent or translucent sheet, the lighting means does not project a shadow of the stiffening element onto the inner face of the sheet.

2. The light box according to claim 1, wherein the stiffening means are composed of at least one stringer or length element joining together two opposite sides of the frame.

3. The light box according to claim 1 or 2, wherein the lighting means are composed of tubes placed parallel to each other in substantially the same plane.

4. The light box according to claim 3, wherein the stiffening means are placed in substantially the same plane as the lighting tubes, and between two adjacent lighting tubes.

5. The light box according to any one of the previous claims, wherein the frame is formed by the association of sections, made up from an extruded channel element.

6. The light box according to any one of the previous claims, further including, on two of its opposite sides, a slide that is designed to receive, by a sliding action, a sliding element that is articulated to rotate on a part attached to a support structure, so as to allow the frame to both slide and rotate in relation to the ceiling.

7. The light box according to claim 6, wherein the slide is composed of a groove hollowed out in the sides of the frame.

8. The light box according to claim 7, wherein the sliding element is composed of a wheel or roller mounted to rotate around a horizontal axis attached to a wall.

9. The light box according to any one of the previous claims, further including means that are designed to hold it open, and which in particular is composed of a flexible wire, a strap or a small chain.

10. The light box according to any one of the previous claims, wherein the lighting means are at least ten centimetres away from the transparent sheet that is most distant from them.

11. A light box substantially as herein described with reference to the accompanying drawings.

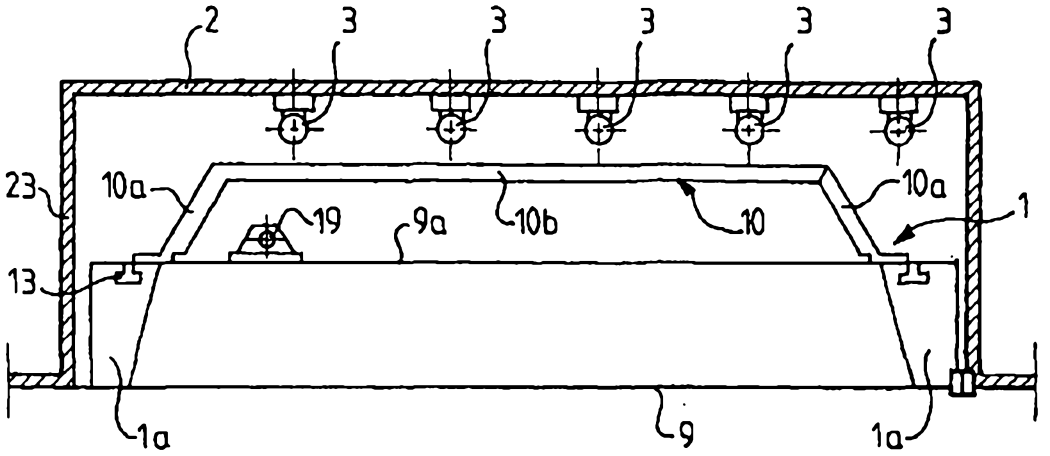
2
3
3
3
3
3
23
10a
19
9a
10b
10
10a
1
13
1a
9
1a

FIG.1

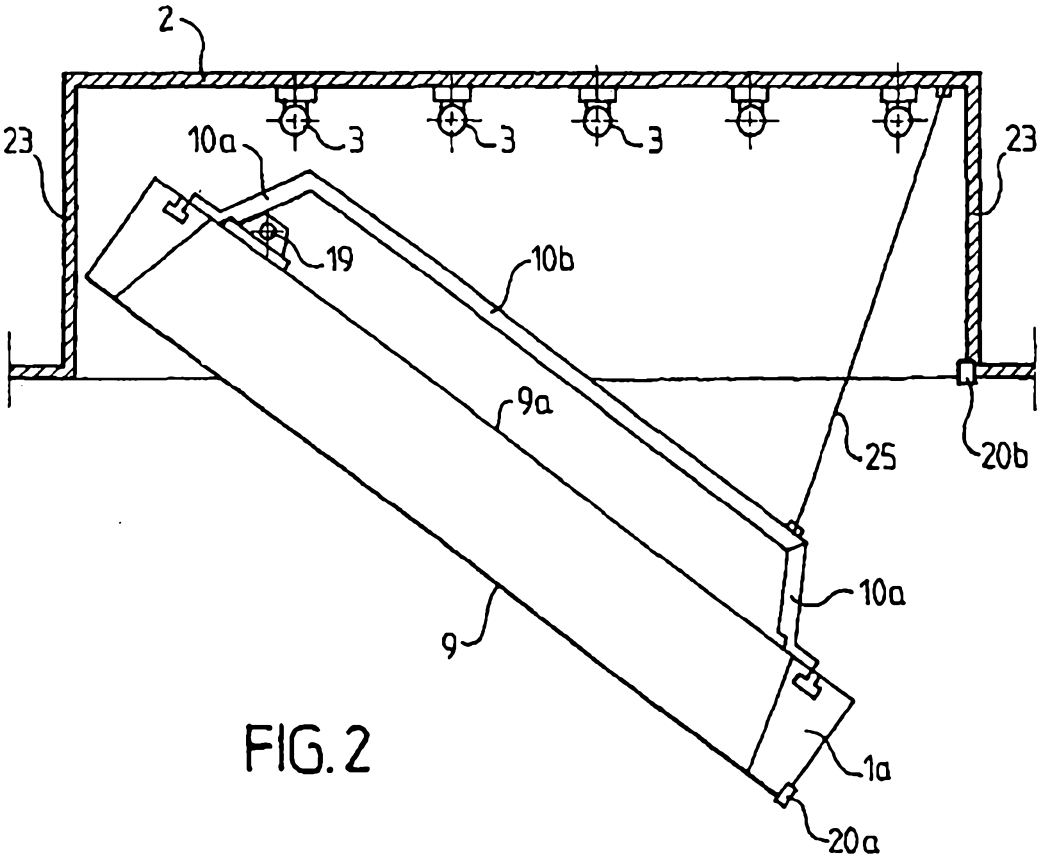
2
23
10a
3
3
3
23
19
10b
9a
25
20b
10a
9
1a
20a

FIG.2

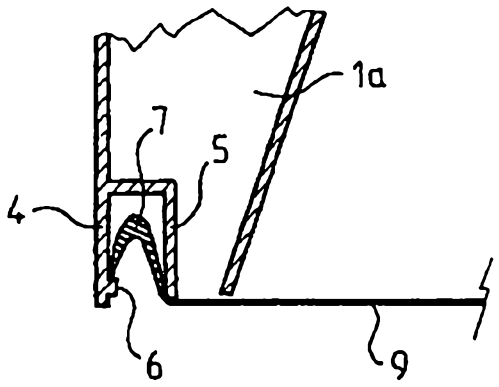

FIG.3

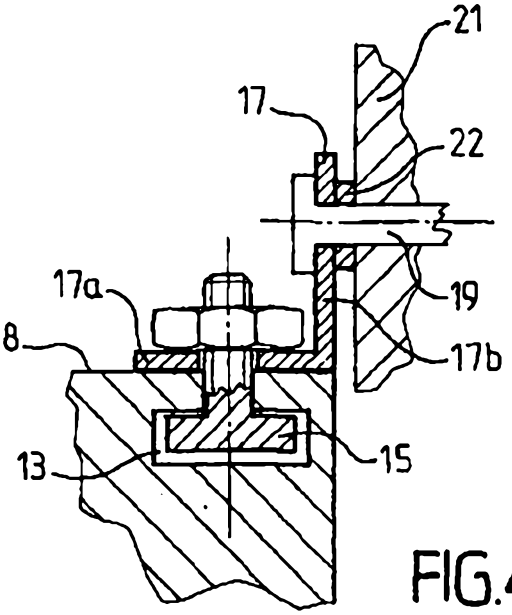

FIG.4

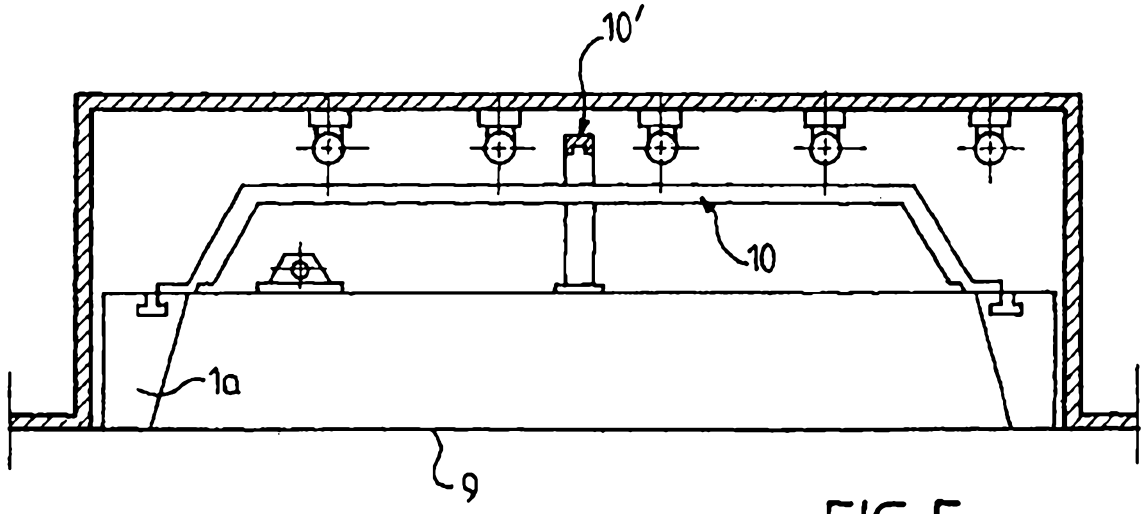

FIG.5

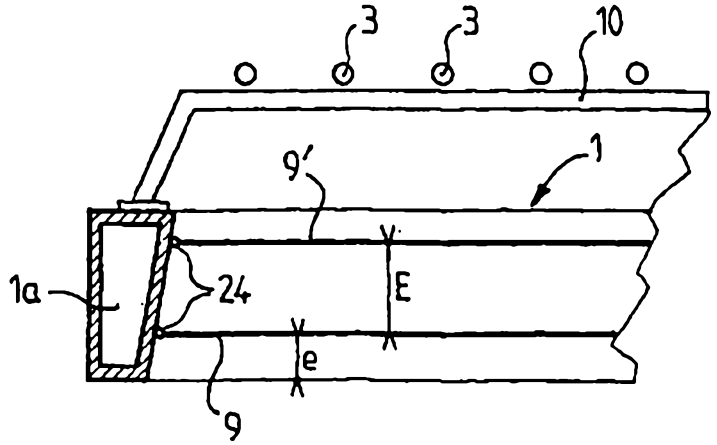

FIG.6

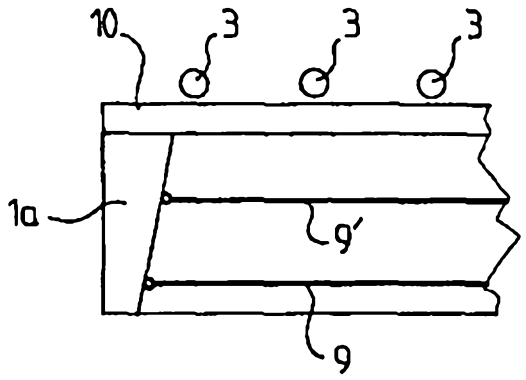

FIG.7

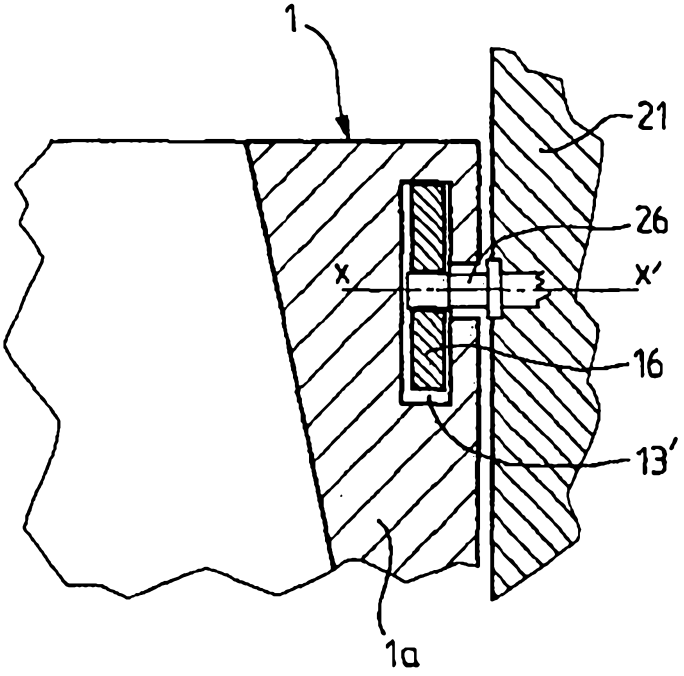

FIG.8