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(54) **Recessed lighting appliance**

Einbauleuchte

Luminaire encastré

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Description

[0001] The present invention relates to recessed lighting appliances, that is suitable for being embedded in the floor, in a wall or in a ceiling, and in particular the recessed lighting appliances which extend mainly along an axis parallel to the floor, wall or ceiling, so as to form a line or blade of light.

[0002] Such appliances comprise a lighting body inserted in a casing previously embedded in the floor, wall or ceiling. More specifically, the casing is positioned on a support surface, preferably closed by a lid; the cement or resin forming the floor is then poured onto the support surface, until the level is par with the upper rim of the casing. At this point the lid or any plugs for the passage of electric cables are removed, the electrical connection of the lighting body is performed and the latter is fixed inside the casing. A prior art appliance according to the preamble of claim 1 is e.g. disclosed in document DE20102832U1.

[0003] One of the problems found with this type of procedure is the fact that often the support surface of the casing is not perfectly even or horizontal (in the case of a floor or ceiling), with the result that the casing, and therefore the lighting body, are not perfectly coplanar with the outer surface of the floor, wall or ceiling. To avoid this type of problem the fitter tries, in a very empirical manner, to position shims under the casing until it proves level. Clearly this is a very approximative and laborious method of proceeding and does not always resolve the problem in that at the moment of pouring the cement the shims and casing may move, thereby rendering ineffective the levelling previously performed.

[0004] Another widely felt problem arises when several appliances must be placed in contact one after the other along their main axis to obtain a very long line of light. In this case in fact, as well as the levelling being even more difficult, it is not easy to align the various appliances perfectly with each other given that the surface of reciprocal contact of the same is very small in relation to their length. In this case too, alignment of the appliances is made even more difficult by the unevenness of the support surface.

[0005] The object of the present invention is to propose a recessed lighting appliance which overcomes the aforementioned difficulties.

[0006] Such object is achieved by a lighting appliance according to claim 1. The dependent claims show preferred or advantageous embodiments of the lighting appliance.

[0007] The characteristics and advantages of the appliance according to the invention will be evident from the description given below of its preferred embodiments, made by way of a non-limiting example, with reference to the attached drawings, wherein:

- Figure 1 is an exploded perspective view of a lighting appliance according to the invention;

- Figure 2 is an end view of the assembled appliance;
- Figures 3 and 3a show two subsequent steps of the coupling of two lighting appliances; and
- Figures 4, 4a and 4b show the same number of installation steps of a lighting assembly comprising two aligned lighting appliances.

[0008] In said drawings, reference numeral 1 globally denotes a recessed lighting appliance according to the invention.

[0009] The appliance comprises a casing 10 extending mainly along a longitudinal appliance axis X and which is suitable for being embedded in a floor, wall or ceiling. The casing 10 has a channel-shaped structure, with a substantially U-shaped transversal cross-section, therefore comprising a flat base 101 and two side walls 102, for example parallel to each other and orthogonal to the base 101. In one embodiment, said side walls 102 have longitudinal ribs 103 for promoting adhesion with the cement or resin.

[0010] In a preferred embodiment, the casing 10 is provided with a removable lid 104 (shown in figures 3 and 3a) suitable for preventing the cement or resin from entering it during the cast. Once the cement or resin has solidified, the lid 104 can be removed.

[0011] In addition, at least one aperture 105 is made in the base 101 and/or in the side walls 102 of the casing for the passage of the electric cables for powering and/or controlling the appliance. Such aperture 105 may also be provided with a removable plug to prevent the entrance of cement or resin in a liquid state.

[0012] The casing 10 is suitable for housing a lighting body 20. Preferably, said lighting body 20 is positioned inside the casing 10 so as to present its lighting surface 21 facing outwardly, preferably towards a flat surface, substantially aligned with the outer surface of the floor, wall or ceiling. In other words, said flat surface 21 of the lighting body 20 is coplanar with the upper rims of the side walls 102 of the casing. In the case of being recessed in the floor, advantageously the lighting appliance is thereby made in such a way as to be fit for walking over.

[0013] In one advantageous embodiment, the lighting body 20 is snap-inserted in the casing 10, that is to say without the use of fitted attachment means, such as screws. For example, the lighting body 20 has an upper portion 22, that is facing outwardly, suitable for abutting against an abutment step 106 made in the inside of each of the side walls 102 of the casing 10, and a lower portion 23 fitted with elastic restraint tabs 24 which snap engage in a restraint undercut 107 made in said side walls 102. In an alternative embodiment, the elastic restraint tabs 24 could be fixed to the casing 10 to snap engage in an undercut made in the lighting body.

[0014] In one embodiment, the lighting body 20 has a dimension in height less than that of the casing, and the abutment step 106 is positioned in such a way that an interspace 110 remains between the lighting body 20 and the base 101 of the casing useful for the passage of elec-

tric cables and in particular to house an electric connector 25 connecting two adjacent lighting appliances.

[0015] In one advantageous embodiment, the ends of the casing 10 are open in an axial direction and the lighting body 20 is the same length as the casing, so that two appliances placed alongside in an axial direction form a continuous line of light.

[0016] For example, the lighting body 20 comprises a row of LED lighting units 26 positioned on an electronic printed circuit board 27.

[0017] The lighting appliance 1 further comprises at least one positioning support 30 suitable to be anchored to a support surface 2 for the appliance and to couple to the casing 10 so as to block the appliance in position in relation to said support surface. Said positioning support 30 is fitted with adjustment feet 32 suitable for adjusting the position of the support 30 in relation to said support surface 2 so that the appliance is perfectly parallel to the outer surface of the floor, wall or ceiling.

[0018] In a preferred embodiment, the positioning support 30 has a central coupling portion 34 to the casing 10 having a "U" shaped cross-section suitable to receive the casing 10, and lateral portions 36 which extend from the base of said central portion and which support the adjustment feet 32 and means of anchorage to the support surface.

[0019] In one embodiment, each adjustment foot 32 comprises a base 40 supporting the support surface of the support, a threaded stem 41 which extends from said base and which ends in an upper end 41' suitable to be engaged by a screwing utensil, and a nut 42 screwed onto said threaded stem 41.

[0020] At least one lateral portion 36 for each side of the positioning support defines a lower seat 38 open towards the support surface and suitable to receive the base 40 of at least one adjustable foot 32, and an upper seat 44 which the nut 42 of the adjustment foot is suitable to be inserted in without the possibility of rotation. An adjustment hole 45 being made in said lateral portion 36 to make the upper end 41' of the threaded stem 41 accessible to the screwing utensil. Preferably, the threaded stem 41 of the adjustment foot projects beyond the upper seat 44, perpendicular to the support surface 2, through the adjustment hole 45.

[0021] In a preferred embodiment, from each side of the base of the support a single lateral portion 36 extends, which continues substantially all along the length of the positioning support 30. The lower 38 and upper 44 seats then are made as two longitudinal respectively upper and lower recesses, parallel to the longitudinal axis X of the appliance. The positioning support 30 can thereby be made as an extruded section.

[0022] In this embodiment, each lateral portion 36 of the positioning support 30 has an adjustment foot 32 near each of its ends.

[0023] In a preferred embodiment, the positioning support 30 is attached to the support surface 2 by screws. To such purpose, further attachment holes 48 are made

in the lateral portions 36 of the support for attachment screws - not shown- which anchor the support to the support surface 2.

[0024] According to a preferred embodiment, the casing 10 and the positioning support 30 couple reciprocally without play, for example with a shaped coupling. This enables the positioning support 30 to also perform a guide function for the alignment of two adjacent appliances, as will be described further below.

[0025] According to a preferred embodiment, the casing 10 and the positioning support 30 are connected to each other by a snap coupling. To such purpose, the casing 10 has, along each of its side walls 12, at least one longitudinal rib 112 suitable to be snap-engaged by a tooth 35' made on a respective side wall 35 of the central portion 34 of the support 30. The coupling of the casing 10 and the positioning support 30 is then performed by exerting a slight pressure on the casing in a direction orthogonal to the support surface 2. Such coupling is extremely rapid and easy for the fitter in that as well as avoiding the use of fitted attachment means such as screws, it makes it possible to connect and separate the casing and the support without making any movement along the support surface which could be prevented by the presence of other appliances, cables, pipes etc.

[0026] Moreover, in a preferred embodiment, the casing 10 and the positioning support 30 are axially sliding in relation to one another. This way, once the casing has been positioned on the support surface, the position of the support in relation to it can be modified, for example so as to choose the best point of anchorage on the support surface or, as will be explained below, to place the support astride two adjacent casings.

[0027] In a preferred embodiment, the ends of the central portion 36 of the positioning support 30 are open in an axial direction so that the positioning support can house the adjacent ends of two casings placed alongside each other.

[0028] In fact, lighting appliances of the type described above are used in particular to obtain continuous lines of light of a longer length than the length of the single appliance. Several appliances may thus be axially aligned, taking care to produce a continuous and perfectly rectilinear luminous effect.

[0029] The positioning support 30 described above may advantageously be placed "astride" two adjacent casings 10 so as to ensure the perfect coaxiality of the appliances. The fitter does not therefore need to worry about aligning the various casings forming the line, such alignment being achieved automatically by the coupling of the casings to a communal positioning support 30.

[0030] Consequently, the positioning support has a dual function: of adjusting the position of the casing 10 in relation to the support surface 2, so that the casing 10 is perfectly parallel to the outer surface of the floor, wall or ceiling, and as a guide for the alignment of two adjacent lighting appliances. Moreover, the support 30 constitutes an anchorage element of the casing to the support sur-

face 2 particularly useful when the cement or resin has not yet solidified.

[0031] It is to be noted that in a preferred embodiment, the positioning support 30 has an axial extension significantly inferior to that of the casing 10, but in any case sufficient to allow the support to act as a guide in aligning two adjacent casings. On the one hand this makes it possible to render the cost of the positioning support negligible compared to the overall cost of the appliance and, on the other, to leave the greater part of the lateral surfaces 102 of the casing free, so as to be able to draw up the end of an orthogonally positioned lighting appliance, ensuring the continuity of the lighting effect.

[0032] The installation of a lighting appliance according to the invention takes place in the following manner.

[0033] At least one positioning support 30 is positioned on the support surface 2. The support is temporarily anchored to the support surface, for example by partially screwing the attachment screws the casing 10 is coupled to the positioning support/s 30. At this point, with the help of an inclination sensor, such as a spirit level, the position of the casing is adjusted, acting on the adjustment feet 32. Once the correct position has been achieved, the anchorage of the supports to the support surface is completed, for example by fully screwing the attachment screws.

[0034] At this point, the support surface may be covered with the cement or resin, up to the desired level. Once the cement or resin has solidified the lid 104 of the casing can be removed and the lighting body 20 can be inserted, if necessary subsequent to making the electrical connections.

[0035] In the case of installing a lighting assembly comprising several lighting appliances 1 according to the invention to form a continuous lighting line, the method is as follows.

[0036] The positioning supports 30 are positioned on the support surface so as to be roughly aligned with each other and spaced out in such a way as to find themselves at the adjacent ends of the casings 10 (figure 4). The casings 10 are then attached to the supports 30 (figure 4a). If necessary, these are translated along the casings so that each one is correctly positioned astride the adjacent ends of two casings. The alignment of the various casings is thus achieved. At this point installation may continue as described above, namely performing the temporary anchorage of the supports, adjusting the inclination of the casings in relation to the support surface, permanently anchoring the supports, casting the cement or resin and after solidification of the floor, wall or ceiling, removing the lids of the casings and installing the lighting bodies.

[0037] A person skilled in the art may make modifications, adaptations and replacements of elements with others functionally equivalent to the embodiments of the lighting appliance according to the invention while remaining within the sphere of protection of the following claims. Each of the characteristics described as belong-

ing to a possible embodiment may be realised independently of the other embodiments described.

5 Claims

1. Recessed lighting appliance, comprising a casing (10) extending mainly along a longitudinal appliance axis (X) and which is suitable to be embedded in a floor, wall or ceiling, and a lighting body (20) suitable to be housed in said casing (10) so as to be substantially aligned with the outer surface of said floor, wall or ceiling, wherein the appliance further comprises a positioning support (30) suitable to be anchored to a support surface (2) for the appliance and to couple to said casing (10) so as to block the appliance in position in relation to said support surface, said appliance being **characterized in that** the positioning support (30) is provided with adjustment feet (32) suitable for adjusting the position of the support in relation to said support surface so that the appliance is perfectly parallel to the outer surface of the floor, wall or ceiling.
2. Appliance according to claim 1, wherein the positioning support (30) has a central coupling portion (34) having a "U" shaped cross-section suitable to receive the casing (10), and at least two lateral portions (36) which extend from the base of said central portion and which support the adjustment feet (32) and means of anchorage to the support surface.
3. Appliance according to claim 2, wherein each adjustment foot (32) comprises a base (40) supporting the support surface of the support, a threaded stem (41) which extends from said base and which ends in an upper end (41') suitable to be engaged by a screwing utensil, and a nut (42) screwed onto said threaded stem (41), and wherein at least one lateral portion (36) for each side of the positioning support defines a lower seat (38) open towards the support surface of the support and suitable to receive the base (40) of at least one adjustable foot (32), and an upper seat (44) which the nut (42) of said adjustment foot is suitable to be inserted in without the possibility of rotation, at least one adjustment hole being made (45) in said lateral portion (36) to make the upper end (41') of the threaded stem (41) accessible to the screwing utensil.
4. Appliance according to claim 3, wherein from each side of the base of the support a single lateral portion (36) extends, which continues substantially all along the length of the positioning support (30), said lower (38) and upper (44) seats being made as two longitudinal upper and lower recesses respectively, parallel to the longitudinal axis (X) of the appliance.

5. Appliance according to any of the claims 2-4, wherein further attachment holes (48) are made in the lateral portions (36) of the support for attachment screws which anchor the support to the support surface. 5
6. Appliance according to any of the previous claims, wherein the casing (10) and the positioning support (30) are coupled to each other without play, for example by a shaped coupling. 10
7. Appliance according to claim 6, wherein the casing (10) has, along each of its side walls (102), at least one longitudinal rib (112) suitable to be snap-engaged by a tooth (35') made on a respective side wall (35) of the central portion (34) of the support. 15
8. Appliance according to any of the previous claims, wherein the casing (10) and the positioning support (30) slide in relation to one another. 20
9. Appliance according to any of the previous claims, wherein the ends of the central portion (34) of the positioning support (30) are open in an axial direction so that the positioning support houses the adjacent ends of two casings placed alongside each other. 25
10. Appliance according to any of the previous claims, wherein the lighting body (20) is snap-inserted in the casing (10). 30
11. Appliance according to any of the previous claims, wherein the ends of the casing (10) are open in an axial direction, and wherein the lighting body (20) is the same length as the casing, so that two appliances placed alongside in an axial direction form a continuous line of light. 35

Patentansprüche

1. Versenkt anbringbare Beleuchtungsvorrichtung, umfassend ein Gehäuse (10), das sich hauptsächlich entlang einer Vorrichtungslängsachse (X) erstreckt und das zur Einbettung in einem Boden, einer Wand oder einer Decke geeignet ist, und einen Beleuchtungskörper (20), der dazu geeignet ist, in dem Gehäuse (10) aufgenommen zu werden, so dass er im Wesentlichen mit der Außenfläche des Bodens, der Wand oder der Decke ausgerichtet ist, wobei die Vorrichtung des Weiteren eine Positionierabstützung (30) umfasst, die geeignet ist, an einer Stützfläche (2) für die Vorrichtung verankert zu werden und an das Gehäuse (10) zu koppeln, um die Vorrichtung in ihrer Position relativ zu der Stützfläche zu blockieren, wobei die Vorrichtung **dadurch gekennzeichnet ist, dass** die Positionierabstützung (30) mit Einstellfüßen (32) versehen ist, die geeignet

sind, die Position der Abstützung relativ zu der Stützfläche so einzustellen, dass die Vorrichtung vollkommen parallel zu der Außenfläche des Bodens, der Wand, oder der Decke ist.

2. Vorrichtung nach Anspruch 1, wobei die Positionierabstützung (30) einen zentralen Kopplungsabschnitt (34) mit einem U-förmigen Querschnitt aufweist, der zur Aufnahme des Gehäuses (10) geeignet ist, und mindestens zwei Seitenabschnitte (36), die sich von der Basis des zentralen Abschnitts erstrecken und die Einstellfüße (32) sowie Mittel zur Verankerung an der Stützfläche abstützen. 10
3. Vorrichtung nach Anspruch 2, wobei jeder Einstellfuß (32) eine Basis (40) umfasst, welche die Stützfläche der Abstützung abstützt, einen Gewindegewand (41), der sich von der Basis erstreckt und in einem oberen Ende (41') ausläuft, das geeignet ist, von einem Schraubwerkzeug in Eingriff genommen zu werden, und eine auf den Gewindegewand (41) aufgeschraubte Mutter (42) und wobei mindestens ein Seitenabschnitt (36) für jede Seite der Positionierabstützung einen unteren Sitz (38) festlegt, der zur Stützfläche der Abstützung geöffnet und zur Aufnahme der Basis (40) mindestens eines Einstellfußes (32) geeignet ist, und einen oberen Sitz (44), in den die Mutter (42) des Einstellfußes eingeführt werden kann ohne die Möglichkeit der Drehung, wobei in dem Seitenabschnitt (36) mindestens ein Einstellloch (45) eingerichtet ist, um das obere Ende (41') des Gewindegewands (41) für das Schraubwerkzeug zugänglich zu machen. 15
4. Vorrichtung nach Anspruch 3, wobei sich von jeder Seite der Basis der Abstützung ein einziger Seitenabschnitt (36) erstreckt, der sich im Wesentlichen entlang der gesamten Länge der Positionierabstützung (30) fortsetzt, wobei der untere Sitz (38) und der obere Sitz (44) als zwei parallel zur Längsachse (X) der Vorrichtung in Längsrichtung verlaufende obere bzw. untere Vertiefungen ausgeführt sind. 35
5. Vorrichtung nach einem der Ansprüche 2 bis 4, wobei in den Seitenabschnitten (36) der Abstützung für Befestigungsschrauben, welche die Abstützung an der Stützfläche verankern, weitere Befestigungslöcher (48) eingerichtet sind. 40
6. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei das Gehäuse (10) und die Positionierabstützung (30), beispielsweise durch eine geformte Kopplung, spielfrei miteinander gekoppelt sind. 45
7. Vorrichtung nach Anspruch 6, wobei das Gehäuse (10) längs jeder seiner Seitenwände (102) mindestens eine Längsrippe (112) aufweist, die geeignet

ist, mit einem Zahn (35') zu verrasten, der an einer entsprechenden Seitenwand (35) des zentralen Abschnitts (34) der Abstützung eingerichtet ist.

8. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei das Gehäuse (10) und die Positionierabstützung (30) relativ zueinander verschiebbar sind. 5
9. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Enden des zentralen Abschnitts (34) der Positionierabstützung (30) in einer axialen Richtung geöffnet sind, so dass die Positionierabstützung die angrenzenden Enden zweier in Längsrichtung aneinander angeordneter Gehäuse aufnimmt. 10 15
10. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei der Beleuchtungskörper (20) in das Gehäuse (10) einschnappt. 20
11. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Enden des Gehäuses (10) in einer axialen Richtung geöffnet sind und wobei der Beleuchtungskörper (20) dieselbe Länge wie das Gehäuse hat, so dass zwei in einer axialen Richtung aneinander angeordnete Vorrichtungen eine durchgehende Lichtlinie bilden. 25

Revendications

1. Luminaire encastré, comprenant un boîtier (10), qui s'étend principalement le long d'un axe longitudinal (X) du luminaire et qui est approprié pour être intégré dans un plancher, un mur ou un plafond, et un corps d'éclairage (20) approprié pour être logé dans ledit boîtier (10) afin d'être sensiblement aligné avec la surface externe dudit plancher, mur ou plafond, le luminaire comprenant en outre un support de positionnement (30) approprié pour être ancré à une surface porteuse (2) pour le luminaire et pour se coupler au dit boîtier (10) afin de bloquer le luminaire en position par rapport à ladite surface porteuse, ledit luminaire étant **caractérisé en ce que** le support de positionnement (30) est équipé de pieds d'ajustement (32) appropriés pour ajuster la position du support par rapport à ladite surface porteuse afin que le luminaire soit parfaitement parallèle à la surface externe du plancher, du mur ou du plafond. 35 40 45 50
2. Luminaire selon la revendication 1, dans lequel le support de positionnement (30) possède une partie de couplage centrale (34) ayant une section en coupe en forme de «U» appropriée pour recevoir le boîtier (10) et au moins deux parties latérales (36) qui s'étendent depuis la base de ladite partie centrale et qui supportent les pieds d'ajustement (32) et un 55

moyen d'ancrage sur la surface porteuse.

3. Luminaire selon la revendication 2, dans lequel chaque pied d'ajustement (32) comprend une base (40) supportant la surface porteuse du support, une tige filetée (41) qui s'étend de ladite base et qui se termine par une extrémité supérieure (41') appropriée pour être en prise avec un outil de vissage, et un écrou (42) vissé sur ladite tige filetée (41), et au moins une partie latérale (36) pour chaque côté du support de positionnement définissant une assise inférieure (38), ouverte vers la surface porteuse du support et appropriée pour recevoir la base (40) d'au moins un pied ajustable (32), et une assise supérieure (44) dans laquelle l'écrou (42) dudit pied d'ajustement est approprié pour y être inséré sans avoir la possibilité de tourner, au moins un trou d'ajustement étant réalisé (45) dans ladite partie latérale (36) afin de rendre l'extrémité supérieure (41') de la tige filetée (41) accessible à l'outil de vissage. 10 15 20
4. Luminaire selon la revendication 3, dans lequel de chaque côté de la base du support s'étend une seule partie latérale (36) qui se continue sensiblement tout le long de la longueur du support de positionnement (30), lesdites assises inférieure (38) et supérieure (44) étant réalisées respectivement en tant que deux évidements supérieur et inférieur, parallèles à l'axe longitudinal (X) du luminaire. 25 30
5. Luminaire selon l'une quelconque des revendications 2 à 4, dans lequel d'autres trous de fixation (48) sont réalisés dans les parties latérales (36) du support pour des vis de fixation qui ancrent le support sur la surface porteuse. 35
6. Luminaire selon l'une quelconque des revendications précédentes, dans lequel le boîtier (10) et le support de positionnement (30) sont couplés l'un à l'autre sans jeu, par exemple par un couplage par complémentarité de formes. 40
7. Luminaire selon la revendication 6, dans lequel le boîtier (10) possède, le long de chacune de ses parois latérales (102), au moins une nervure longitudinale (112) appropriée pour être en prise par encliquetage avec une dent (35') réalisée sur une paroi latérale respective (35) de la partie centrale (34) du support. 45 50
8. Luminaire selon l'une quelconque des revendications précédentes, dans lequel le boîtier (10) et le support de positionnement (30) coulissent l'un par rapport à l'autre. 55
9. Luminaire selon l'une quelconque des revendications précédentes, dans lequel les extrémités de la partie centrale (34) du support de positionnement

(30) sont ouvertes dans une direction axiale afin que le support de positionnement reçoive les extrémités adjacentes de deux boîtiers dans le prolongement l'un de l'autre.

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10. Luminaire selon l'une quelconque des revendications précédentes, dans lequel le corps d'éclairage (20) est inséré par encliquetage dans le boîtier (10).

11. Luminaire selon l'une quelconque des revendications précédentes, dans lequel les extrémités du boîtier (10) sont ouvertes dans une direction axiale et le corps d'éclairage (20) possède la même longueur que le boîtier afin que deux luminaires juxtaposés dans une direction axiale forment une ligne continue de lumière.

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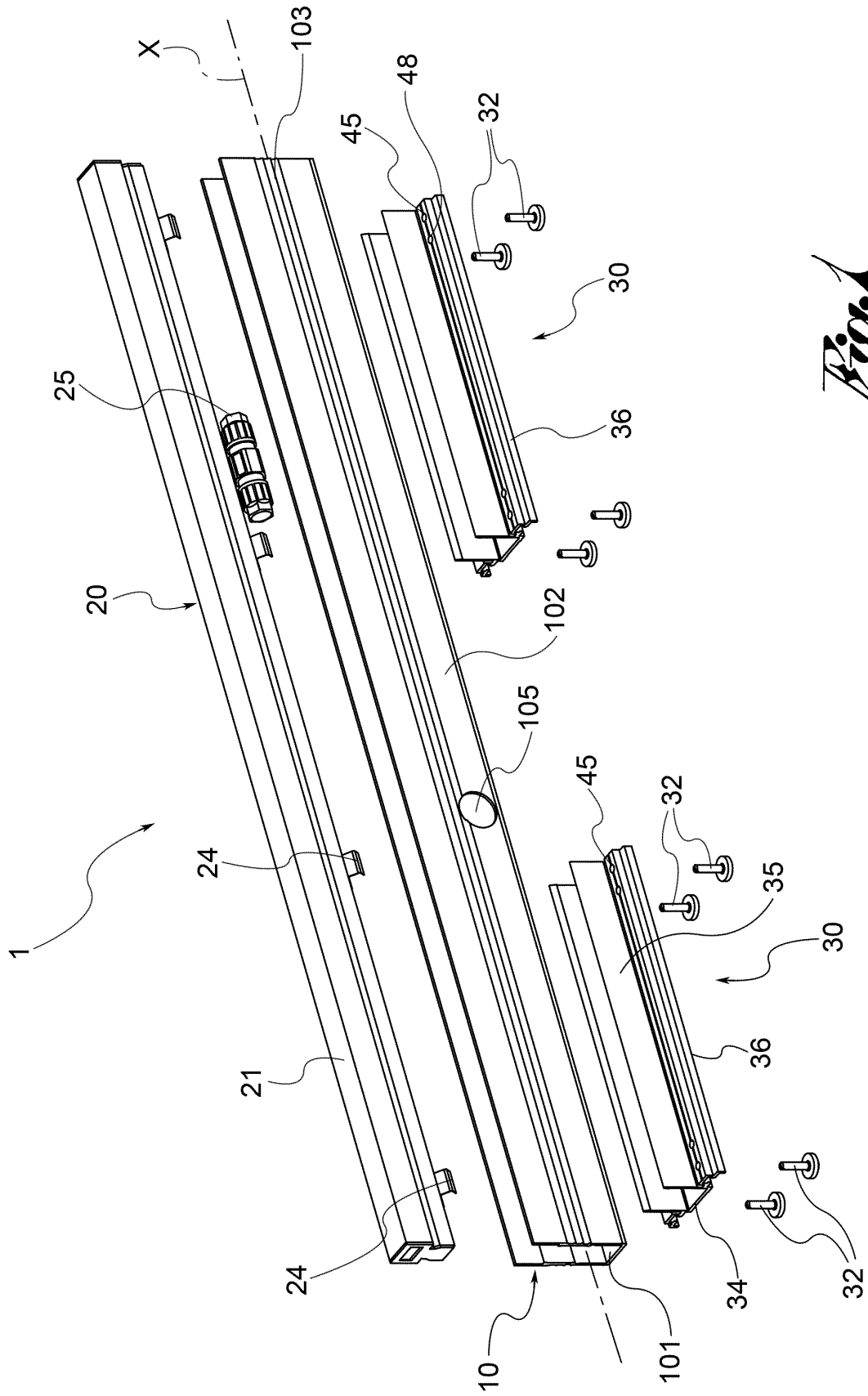


Fig. 1

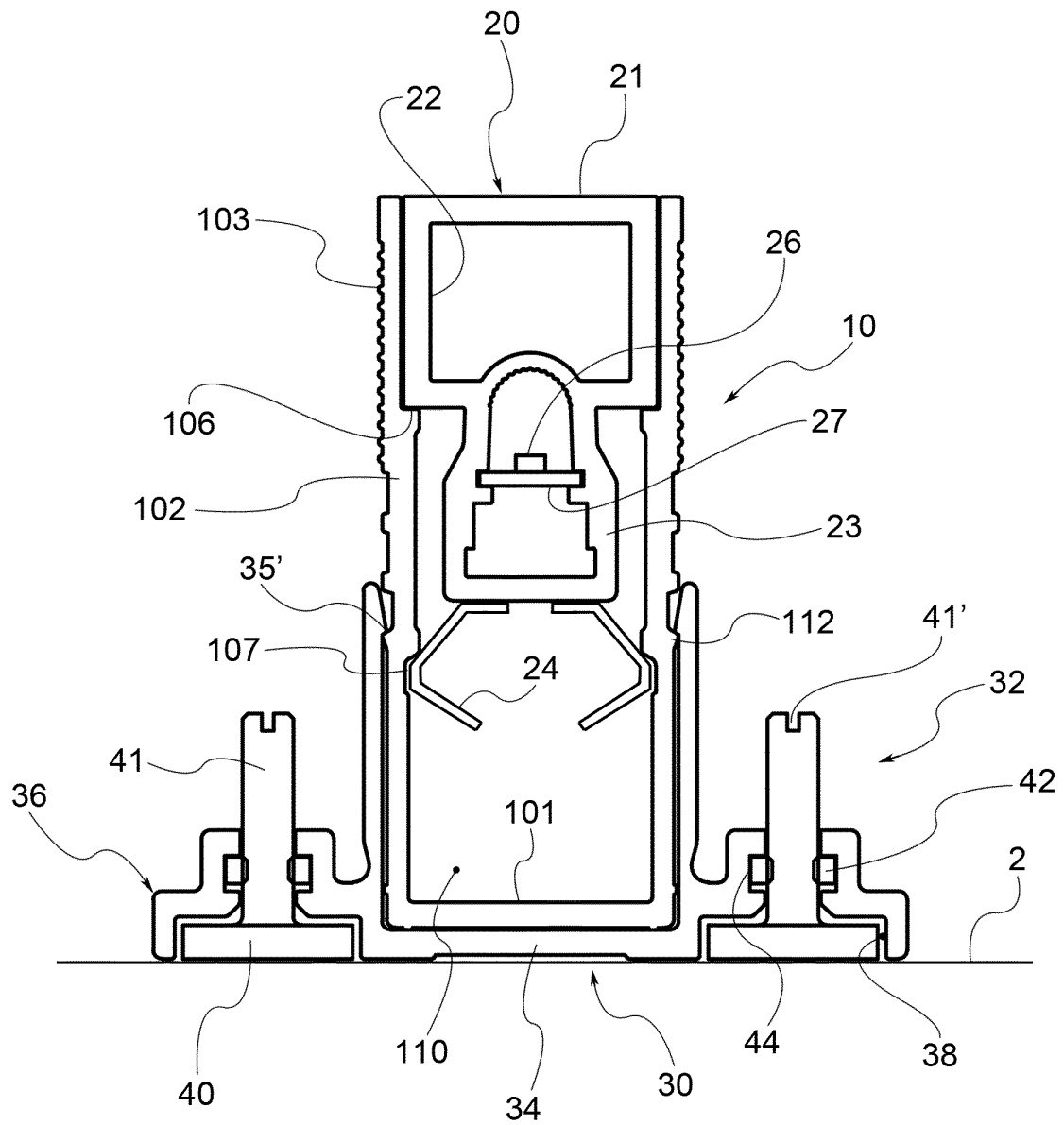
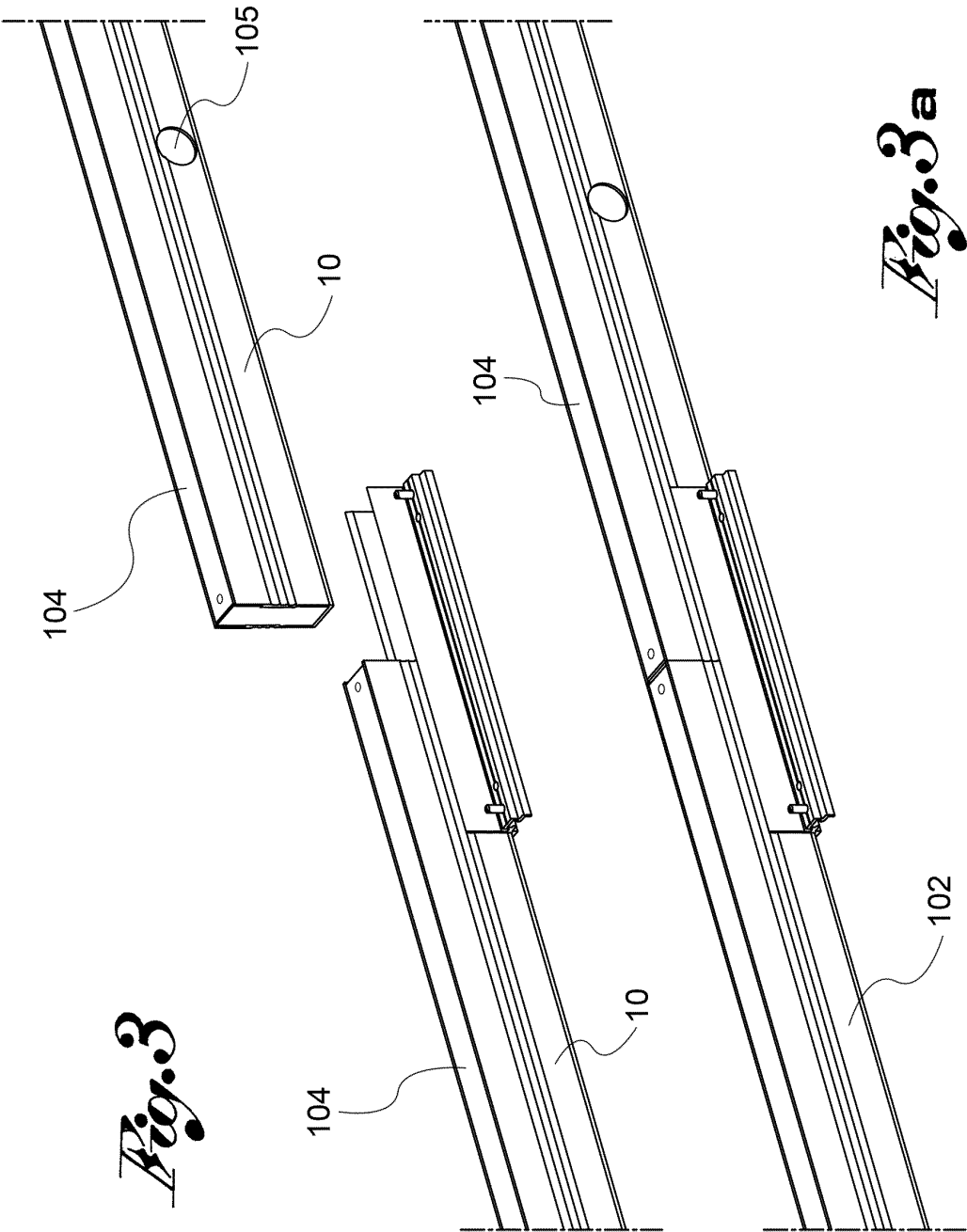


Fig. 2



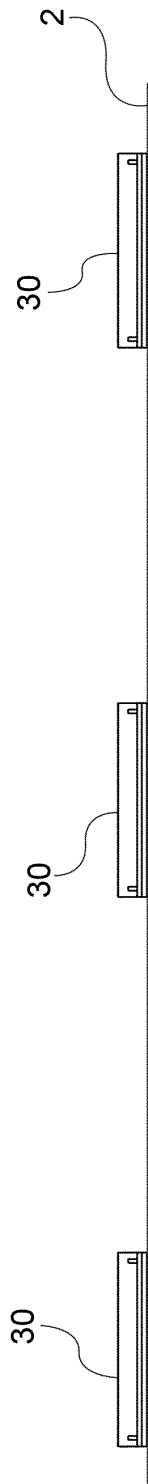


Fig. 4

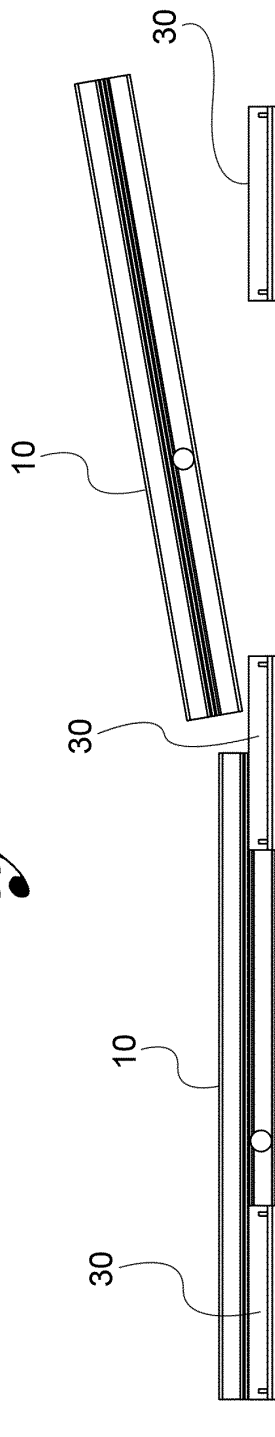


Fig. 4a

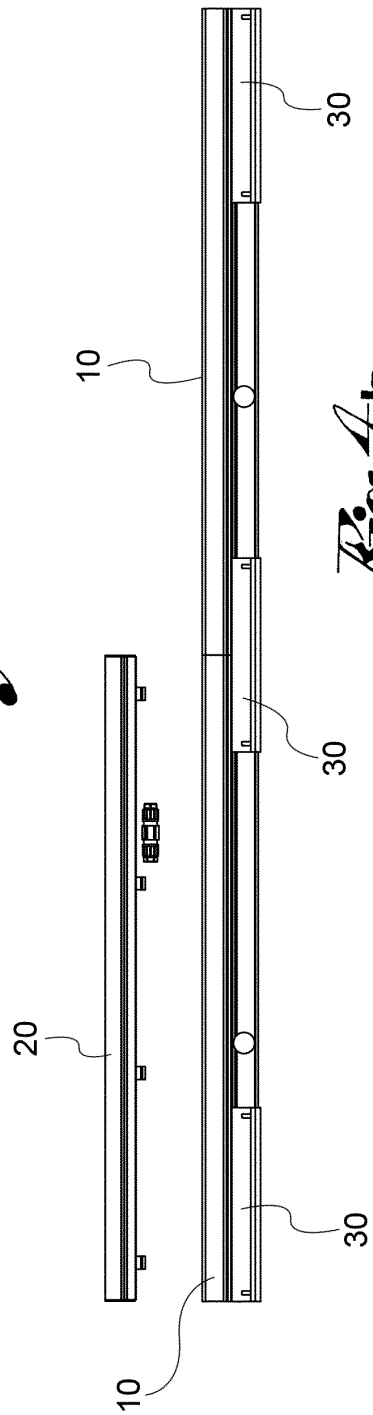


Fig. 4b

REFERENCES CITED IN THE DESCRIPTION

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