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(54) **Modular lighting system for recessed mounting in floor or wall**

(57) A modular lighting system for recessed mounting, including an outer casing that can be recessed in a wall or floor and one or more modular components that include single modules and multiple modules; a multiple module is dimensionally a multiple of a single module and the outer casing is constituted by a single body that is divided into sectors by means of easily breakable partitions, each sector corresponding dimensionally to the single module. The modular system allows to provide

practically continuous lighting, ensuring a lighting technology performance of high value, and offers the possibility to vary the length of the product as a function of the requirements in a substantially linear manner, allowing to adapt perfectly the actually lit length with respect to the required length. Other advantages of the modular system are easy and quick installation, the possibility to change its configuration subsequently, and simplified management of the product in stock.

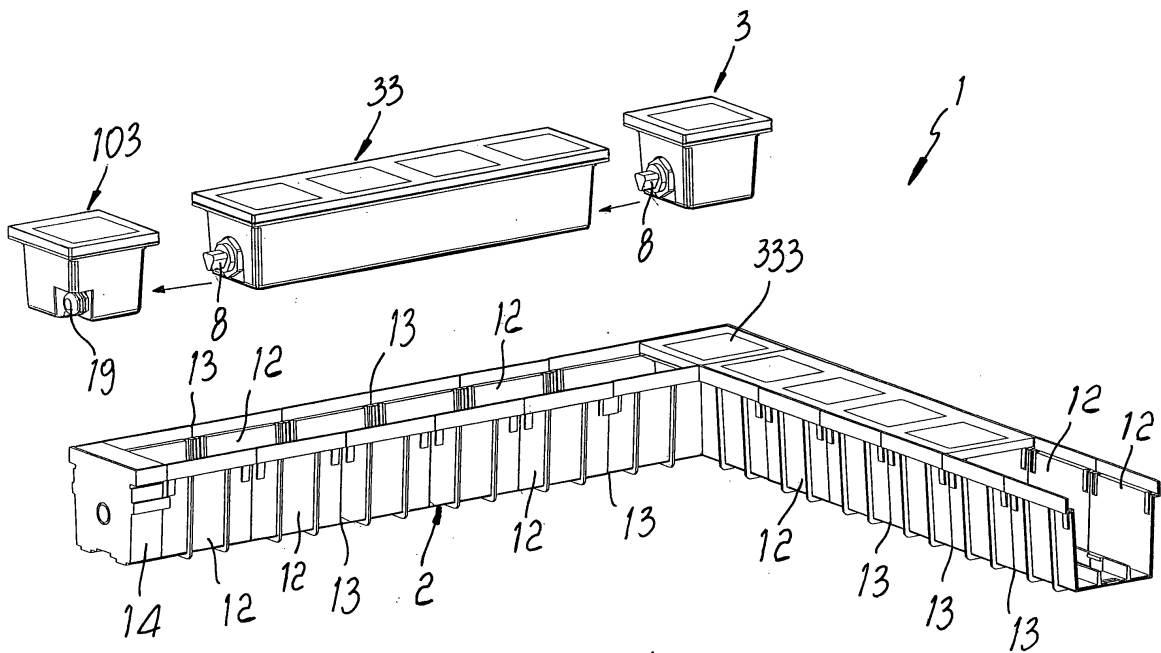


Fig. 1

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Description

[0001] The present invention relates to a lighting system for recessed mounting.

[0002] Conventional lights for recessed mounting in walls and floors are substantially constituted by an outer casing which accommodates the lighting devices, incandescent lamps, fluorescent lamps or, in the most recent products, LEDs.

[0003] Currently commercially available products have outer casings of a preset length and therefore do not allow to perfectly adapt the length that is actually illuminated with respect to the required length.

[0004] It is seldom possible to obtain a lighting structure that has the exact length of the surface to be illuminated: the product available from a catalog is often too long or too short and there are technological limitations to the manufacture of products beyond a certain length.

[0005] Also, the minimum distance between two contiguous products is, in the best of cases, the sum of the shoulders of the closing flanges of the devices.

[0006] In some cases, if the installation section of the outer casing is larger than the cross-section of the product, the closure flanges are not even adjacent.

[0007] Conventional outdoor devices for recessed mounting in a wall/floor do not allow truly continuous lighting, because when several components are arranged side by side, conventional products show evident discontinuities caused by the minimum distance between two successive lighting units.

[0008] Conspicuous discontinuities are also evident in the points where a directional variation is present, typically at the corners.

[0009] The conventional products also entail inventory and stock problems, because it is necessary to manage a rather large number of models of different dimensions in order to ensure a minimum of dimensional adaptability.

[0010] Another drawback of conventional recessed-mount systems is that it is not possible to easily vary the position of the light spots in order to concentrate or reduce lighting in preset positions, as instead would be desirable in some cases, for example in spaces designed for exhibitions and displays, where the position and dimensions of the objects to be lit vary as the exhibition event changes.

[0011] The aim of the present invention is to provide a lighting system for recessed mounting for walls and floors that overcomes the drawbacks of the prior art.

[0012] An object of the invention is to provide a modular lighting system that is capable of providing a substantially continuous lighting, ensuring a lighting technology performance of high value.

[0013] Another object of the invention is to provide a lighting system that offers the possibility to vary the length of the product as a function of the requirements in a substantially linear manner, allowing to perfectly adapt the actually lit length with respect to the required length.

[0014] A further object is to provide a lighting system

that allows to provide variations in the direction of the lighting system without interruptions in the continuity of the lighting.

[0015] Another object of the invention is to provide a lighting system that allows to adapt the outer casing according to the requirements, differently from currently commercially available products which have outer casings of a preset length which cannot be modified.

[0016] Another object of the invention is to provide a lighting system in which the minimum distance between two successive components is extremely reduced, so as to eliminate any aesthetic discontinuity of the product, which appears aesthetically identical over its entire length, even independently of variations in direction.

[0017] Another object of the invention is to provide a lighting system that allows extremely simpler management of the product in stock.

[0018] Another important object of the invention is to provide a lighting system that can be installed very easily and quickly.

[0019] Another important object of the invention is to provide a lighting system that is extremely versatile and allows to easily change the position of use of the product even when the product is already installed.

[0020] Another object of the present invention is to provide a lighting system which, by virtue of its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

[0021] Another object of the present invention is to provide a lighting system that can be manufactured easily by using commonly commercially available elements and materials and is also competitive from an economic standpoint.

[0022] This aim and these and other objects that will become better apparent hereinafter are achieved by a lighting system for recessed mounting, comprising an outer casing that can be recessed in a wall or floor and one or more lighting devices, characterized in that the lighting devices are constituted by modular components that comprise single modules and multiple modules, said multiple modules being dimensionally multiples of a single module, said outer casings allowing mutual assembly in a modular fashion, each module being constituted by a single body that is divided into sectors by means of easily breakable partitions, each sector corresponding dimensionally to said single module.

[0023] Further characteristics and advantages will become better apparent from the description of preferred but not exclusive embodiments of the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially exploded perspective view of the lighting system for recessed mounting according to the present invention;

Figure 2 is a perspective view, similar to the preceding one, of the system in a different configuration;

Figure 3 is a plan view of a multiple module of the

lighting system according to the present invention;
Figure 4 is a perspective view of the multiple module of the preceding figure;

Figure 5 is a longitudinal sectional view, taken along the sectional plane V-V of Figure 3, of the multiple module of the preceding figure;

Figure 6 is a transverse sectional view, taken along the sectional plane VI-VI of Figure 3, of the multiple module of the preceding figure;

Figure 7 is a perspective view of a single module of the lighting system according to the present invention;

Figure 8 is a plan view of the single module of the preceding figure;

Figure 9 is a longitudinal sectional view, taken along the sectional plane IX-IX of Figure 8, of the single module of the preceding figure;

Figure 10 is a transverse sectional view, taken along the sectional plane X-X of Figure 8, of the single module of the preceding figure;

Figure 11 is a perspective view of an implementation of the lighting system for recessed mounting according to the present invention.

[0024] With reference to the cited figures, the lighting system for recessed mounting according to the invention, generally designated by the reference numeral 1, comprises one or more outer casings 2 that accommodate one or more lighting modules 3, 33.

[0025] Each lighting module can be constituted by a single module 3 or by a multiple module 33, where the term "single" means a module that constitutes a basic unit and the term "multiple" means a module that is dimensionally a multiple of a single unit.

[0026] In the illustrated embodiment, the single module 3 includes a single lighting component, in the specific case the LED 4, while the multiple module includes a plurality of lighting components 4.

[0027] The single module may in any case contain lighting units that differ both in number and in type.

[0028] The single module 3 is constituted by a box 5, which is closed in an upper region by an at least partially transparent plate 6.

[0029] The LED 4 is associated with a supporting and wiring component 7, which is connected electrically to a male connector 8 and to a female connector 9.

[0030] The connectors 8 and 9 are arranged on the lateral portions of the box 5.

[0031] The module 3 comprises a reflector component 10, which is suitable to reflect the light emitted by the lighting unit 4 toward the transparent plate 6.

[0032] An engagement component 11, for example an elastic clip, is associated with the lower outer surface of the box 5 and is adapted to fix the module inside the outer casing 2.

[0033] The multiple module 33 is similar to the single module and includes an elongated box 55, which is closed in an upper region by a plate 66 that is at least

partially transparent.

[0034] The LEDs 4 are associated with a supporting and wiring component 77, which is connected electrically to a male connector 8 and to a female connector 9.

[0035] The connectors 8 and 9 are arranged on the lateral portions of the box 55.

[0036] The multiple module 33 comprises a reflector component 110, which is suitable to reflect the light emitted by the lighting units 4 toward the transparent plate 66.

[0037] The multiple module 33 has a plurality of engagement components 11, which are associated with the lower outer surface of the box 55, in order to fix the module within the outer casing 2.

[0038] An end module 103 is substantially similar to a single or multiple module and further comprises a power supply connector 19, for supplying power to the entire system.

[0039] A corner module 333, which differs from the single module 3 in that it has the connectors 8 and 9 arranged on two adjacent sides instead of opposite sides, constitutes a direction changing unit, as shown schematically in Figures 1, 2 and 11.

[0040] The outer casings 2 are constituted by a single molded body, which is made of plastics and is preferably divided into sectors 12 by means of easily breakable partitions 13, and can be assembled together according to the specific requirements.

[0041] Each sector 12 corresponds dimensionally to a single module 3 so that the outer casing 2 can be adapted to the number of single modules or to the dimensions of the multiple modules that one wishes to use.

[0042] The system also comprises end components 14 to be applied to the free ends of the outer casing.

[0043] Figures 1, 2 and 11 illustrate some examples of configuration of the modular lighting system according to the present invention.

[0044] The installation of the system initially entails laying the outer casings 2, whose longitudinal extension can be adjusted easily by separating the excess sectors 12 by breaking the partitions 13 and/or by assembling multiple adjacent outer casings.

[0045] Once the outer casings have been installed, the modules are inserted and simply arranged side by side, in order to connect them electrically by means of the female and male connectors, locking them onto the bottom of the outer casing by means of the clips 11.

[0046] In order to allow to insert regions of discontinuity of the lighting, there are aesthetic modules 15, which are sized like the single or multiple modules in order to replace them along the extension of the system.

[0047] Electrical continuity between lighting modules separated by aesthetic modules is ensured by suitable wiring which connects the female and male connectors of the two modules separated by the aesthetic module 15.

[0048] The modular system of the present invention solves the problems of the prior art.

[0049] In the lighting system according to the present invention, the distance between contiguous modules is

so small that the center distance between the light sources within a module is maintained even in passing from one module to the next, without compromising luminous uniformity.

[0050] By virtue of the possibility to combine any number of modules consecutively, without aesthetic or lighting technology-related discontinuities, it is possible to provide luminous strips of exactly the necessary length.

[0051] By combining the single and multiple modules, it is in fact obtained exactly the desired length.

[0052] Corners do not constitute points of discontinuity, because they maintain the characteristics cited above, allowing lighting even at the corner, by using an appropriately provided corner module 333 to be inserted in an appropriately provided outer corner casing that can be assembled together with the preceding ones.

[0053] The electrical connection system of the lighting system according to the present invention allows to limit the wiring operation to the first unit and to obtain sequentially the connection of all the other devices, simply by interlocking them successively.

[0054] Once the outer casing has been installed, it is possible to arrange the modules at will inside it reversibly.

[0055] The arrangement of the modules within the outer casing can be continuous, as shown in Figure 1, or discontinuous, as shown schematically in Figure 2, only at the objects that one wishes to light at that moment, covering any holes with the appropriately provided aesthetic modules.

[0056] The lighting system allows to vary the color of the light at a given point by simply choosing the suitable module, i.e., with a lighting unit 4 or transparent plate 6 of the chosen color.

[0057] The lighting system according to the present invention also allows to adjust the luminous intensity, by means of a dimmer, of the entire line by acting only on the first module.

[0058] In practice it has been found that the invention achieves the intended aim and objects, a lighting system for recessed mounting having been provided which allows to obtain a practically continuous lighting while ensuring a lighting technology performance of great value with respect to the products of the prior art, which have evident discontinuities linked to the minimum distance between two successive lighting units.

[0059] The lighting system according to the present invention offers the possibility to vary the length of the product according to the requirements in a substantially linear manner, in contrast to the conventional products known up to now, which by not being modular do not allow to adapt perfectly the length that is actually lit with respect to the required one.

[0060] The lighting system according to the present invention also allows to provide variations in the direction of the product without interruptions in the continuity of the lighting, in contrast to hitherto known products, which have evident discontinuities in the points where it was

necessary to ensure a directional passage.

[0061] Another important advantage of the lighting system according to the present invention is constituted by the possibility to adapt the dimensions of the outer casing to the specific requirements, in contrast to hitherto known products, which have outer casings of a preset and non-modifiable length.

[0062] The lighting system according to the present invention also has the important advantage of being able to vary easily the distribution of the light, even when the product is already installed, simply by varying the position of the modules. The possibility to supply the modules after the first one by simply interlocking them, with consequent extremely easy assembly and speed in execution, is extremely advantageous both during first installation and subsequently, when one wishes to modify the lighting configuration.

[0063] Another important advantage of the lighting system according to the present invention is constituted by the simplified management of the product in stock, due to its extreme modularity, which allows to manage a minimal number of unit types.

[0064] This application claims the priority of Italian Patent Application No. MI2008A001531, filed on August 21, 2008, the subject matter of which is incorporated herein by reference.

Claims

1. A lighting system for recessed mounting, comprising an outer casing that can be recessed in a wall or floor and one or more lighting devices, **characterized in that** the lighting devices are constituted by modular components that comprise single modules and multiple modules, said multiple modules being dimensionally multiples of a single module, said outer casings allowing mutual assembly in a modular fashion, each module being constituted by a single body that is divided into sectors by means of easily breakable partitions, each sector corresponding dimensionally to said single module.
2. The lighting system according to claim 1, **characterized in that** each of said modules comprises at least one lighting component, which is associated with a supporting and wiring component that is connected electrically to a male connector and to a female connector, said connectors being arranged on the lateral portion of said module.
3. The lighting system according to claim 1 or 2, **characterized in that** said module comprises a box that is closed in an upper region by an at least partially transparent plate and also comprises a reflector that is suitable to reflect the light emitted by said lighting unit toward said transparent plate.

4. The lighting system according to one or more of the preceding claims, **characterized in that** said module comprises an engagement component that is associated with the lower outer surface of said box in order to fix said module within said outer casing. 5
5. The lighting system according to one or more of the preceding claims, **characterized in that** said lighting component is constituted by a LED. 10
6. The lighting system according to one or more of the preceding claims, **characterized in that** it comprises an end module that comprises a power supply connector that allows to supply power to the entire system. 15
7. The lighting system according to one or more of the preceding claims, **characterized in that** it comprises a corner module in which said male and female connectors are arranged on two adjacent sides, in order to constitute a direction changing unit. 20
8. The lighting system according to one or more of the preceding claims, **characterized in that** it comprises end components to be applied to the free ends of said outer casing. 25

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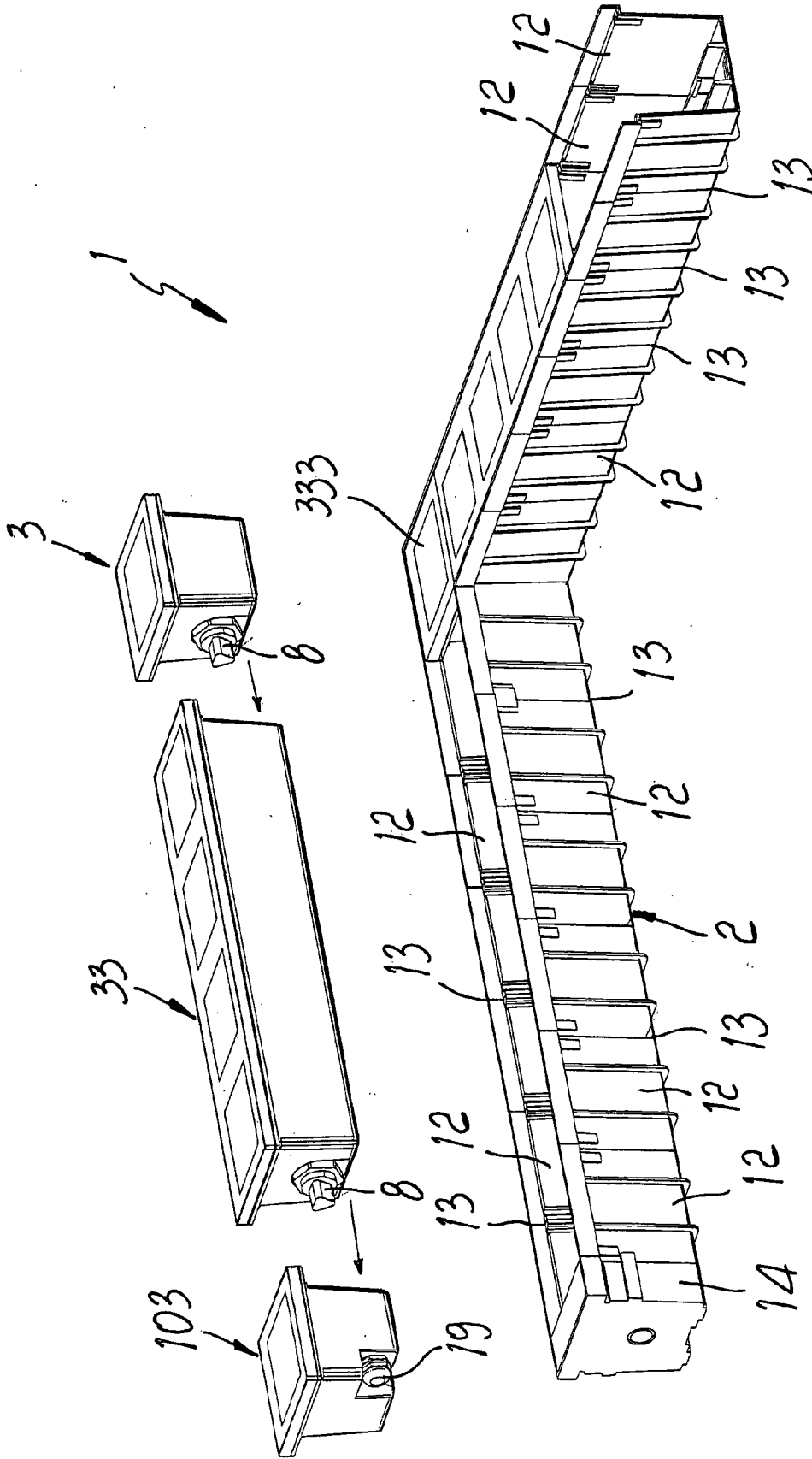


Fig. 1

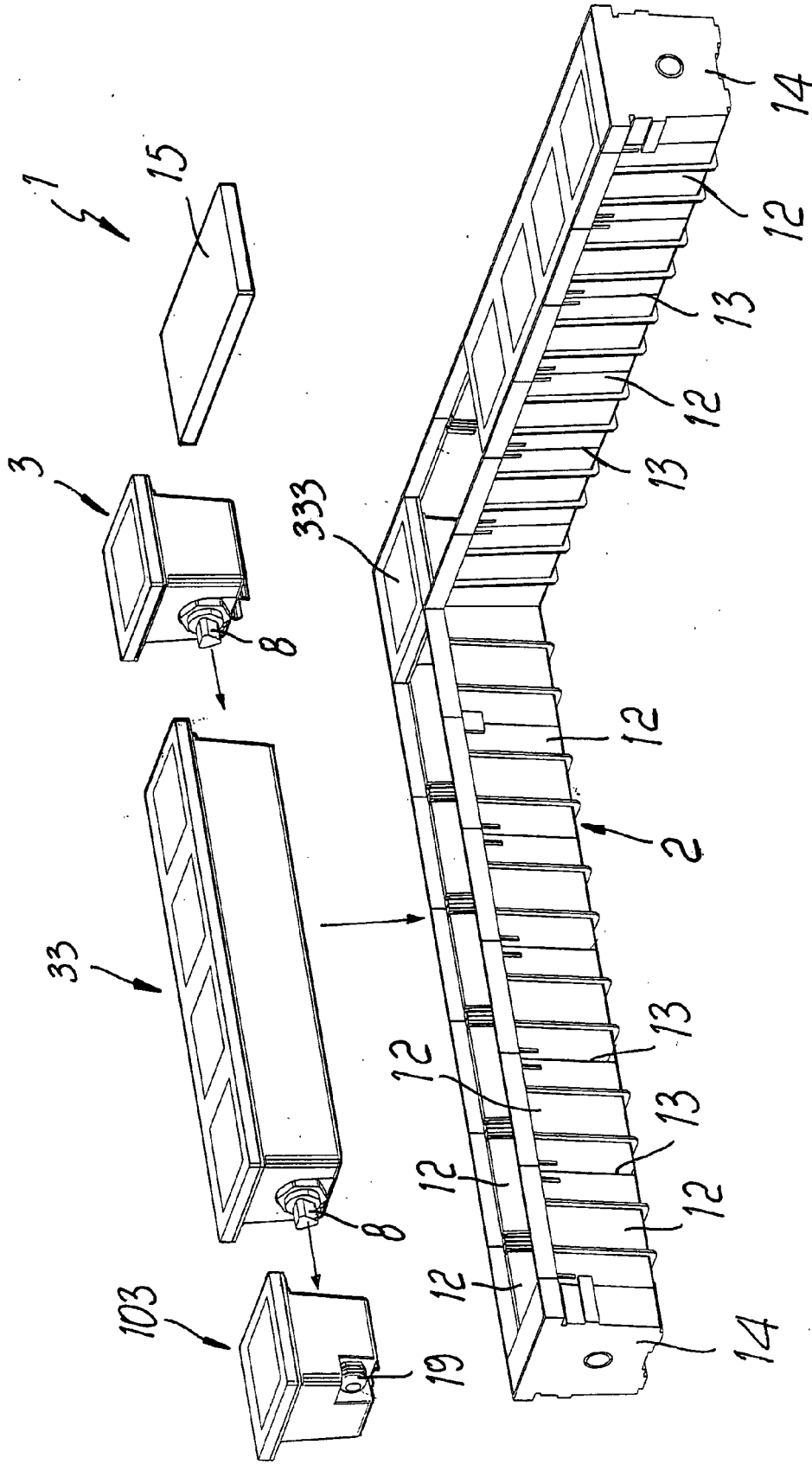


FIG. 2

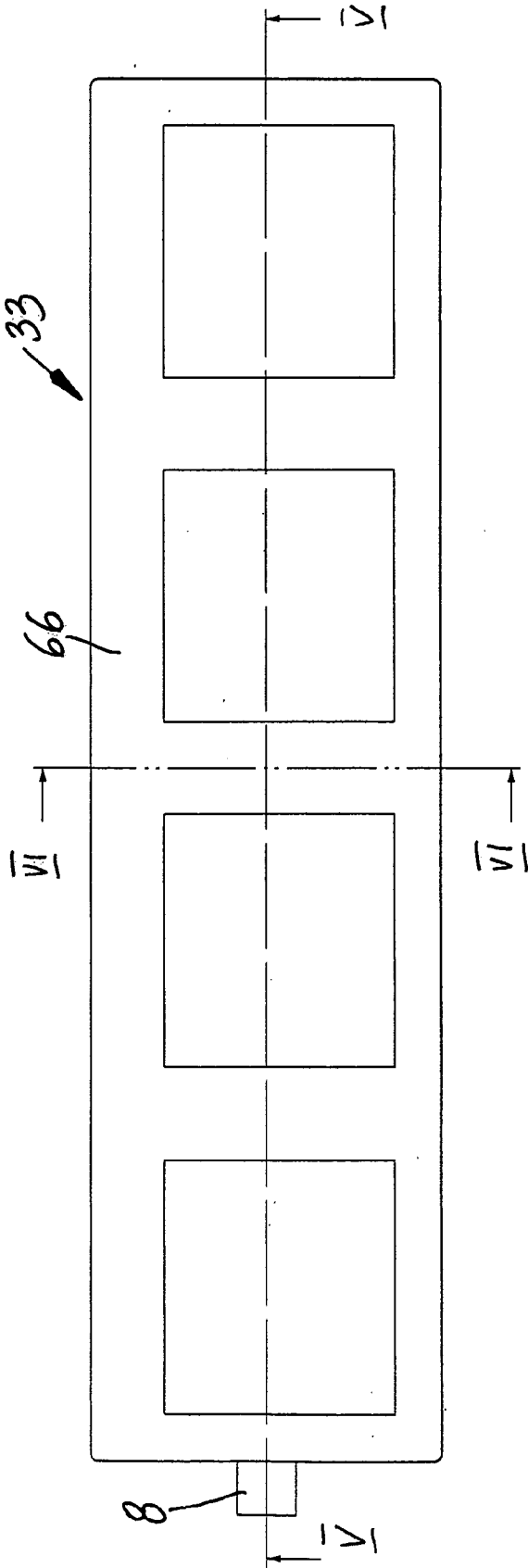


Fig. 3

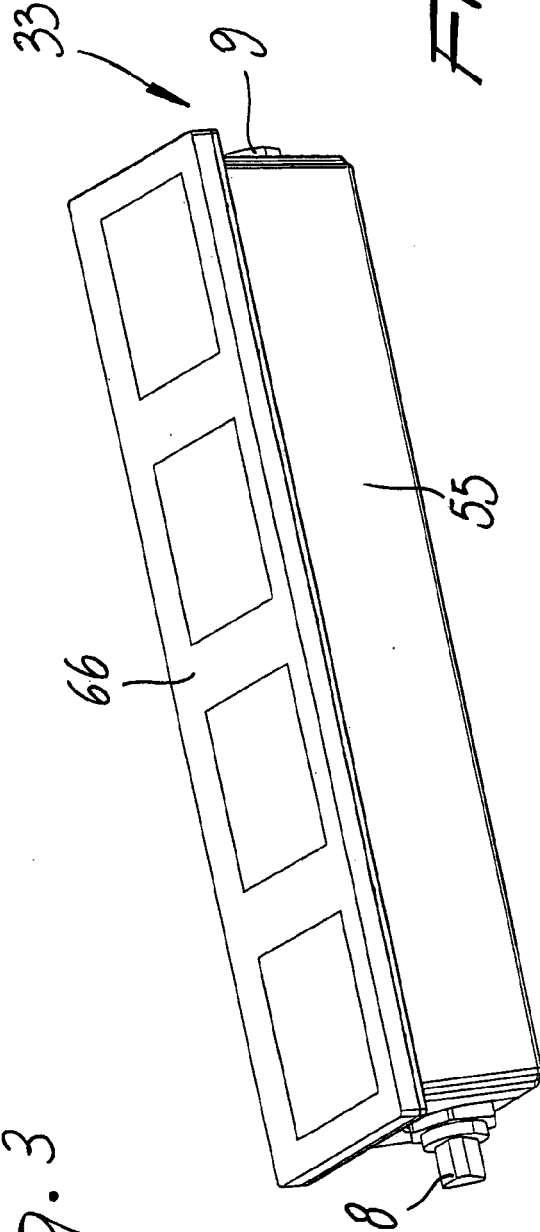


Fig. 4

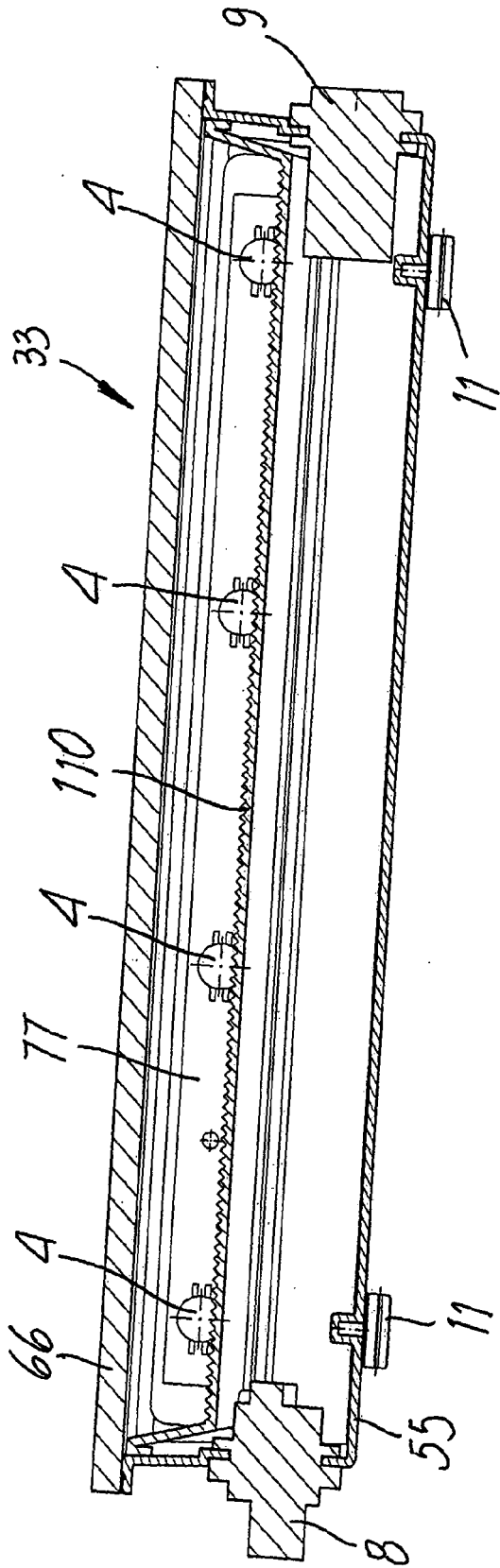


Fig. 5

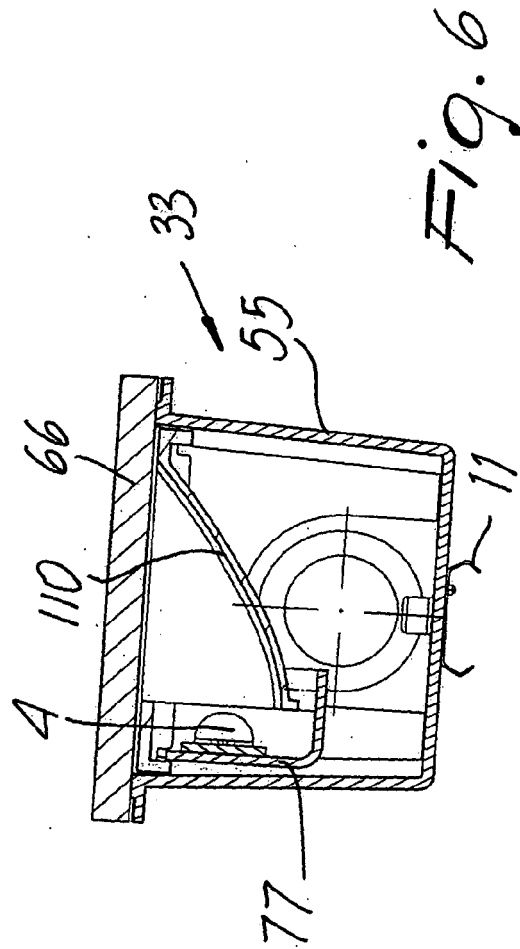


Fig. 6

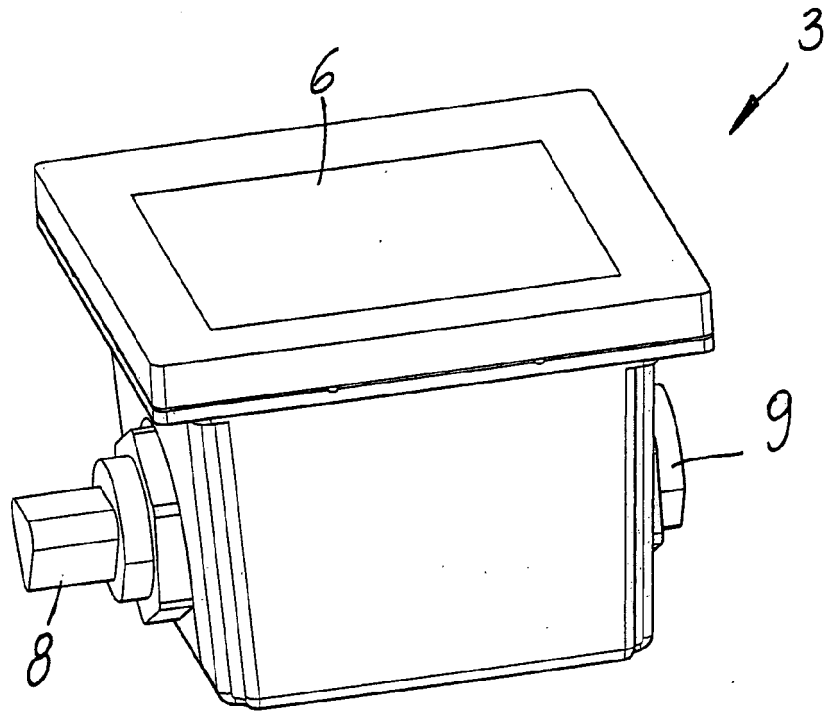


Fig. 7

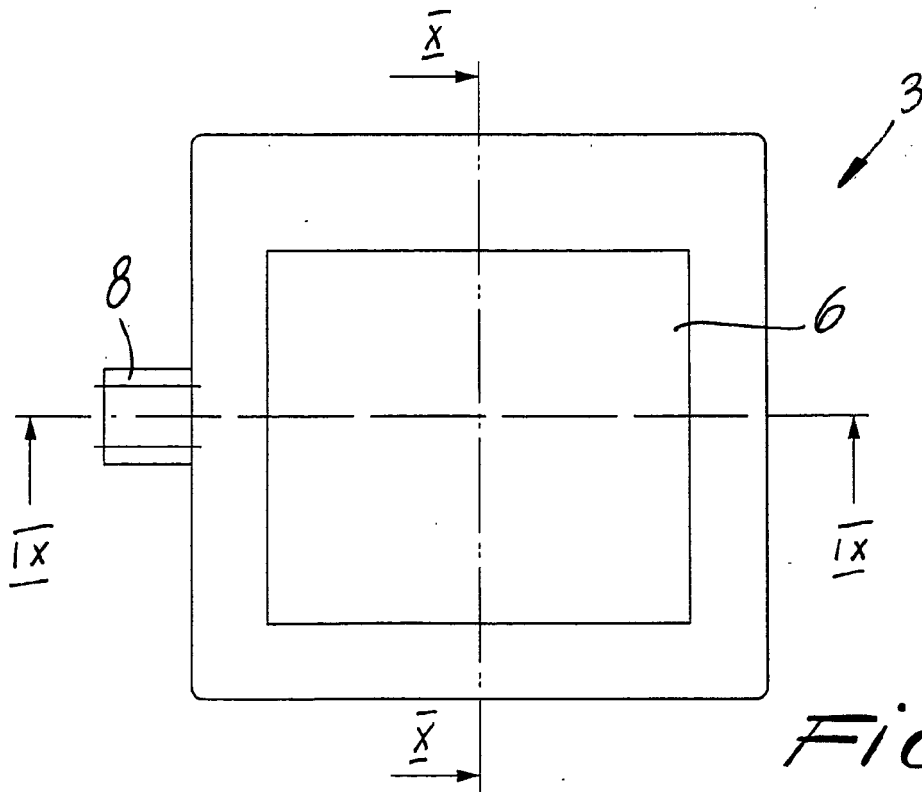


Fig. 8

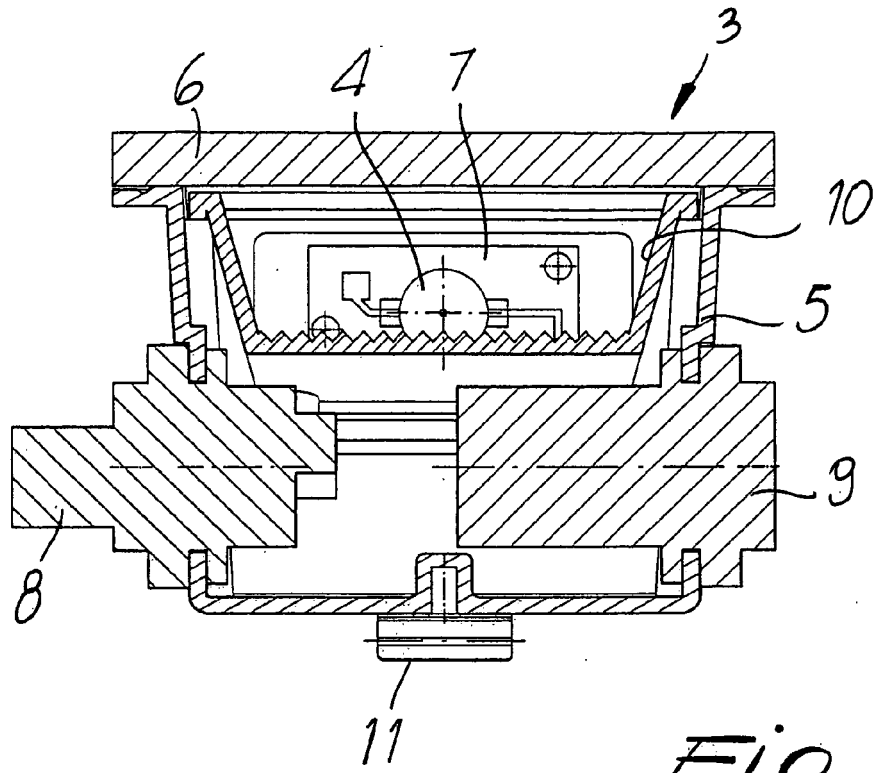


Fig. 9

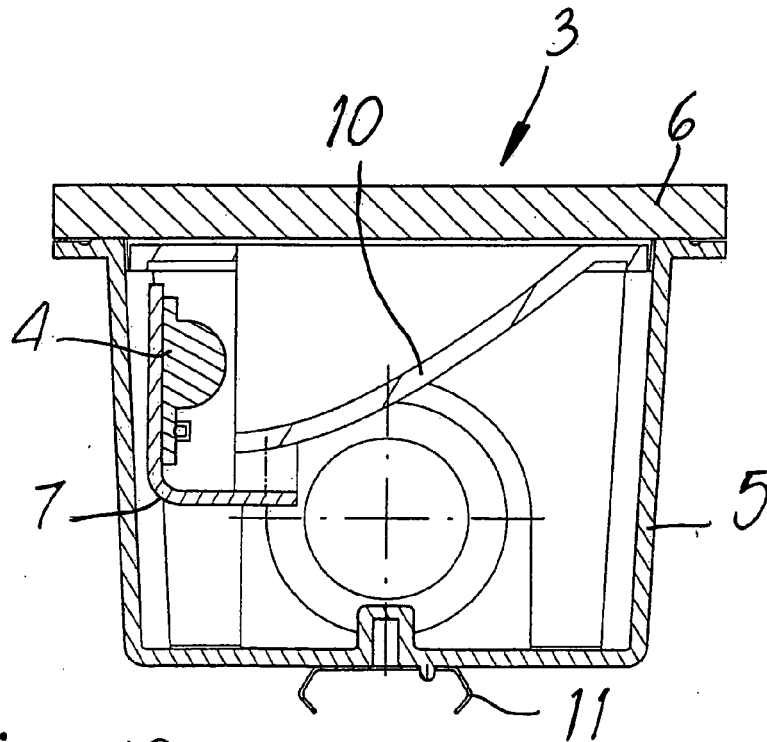
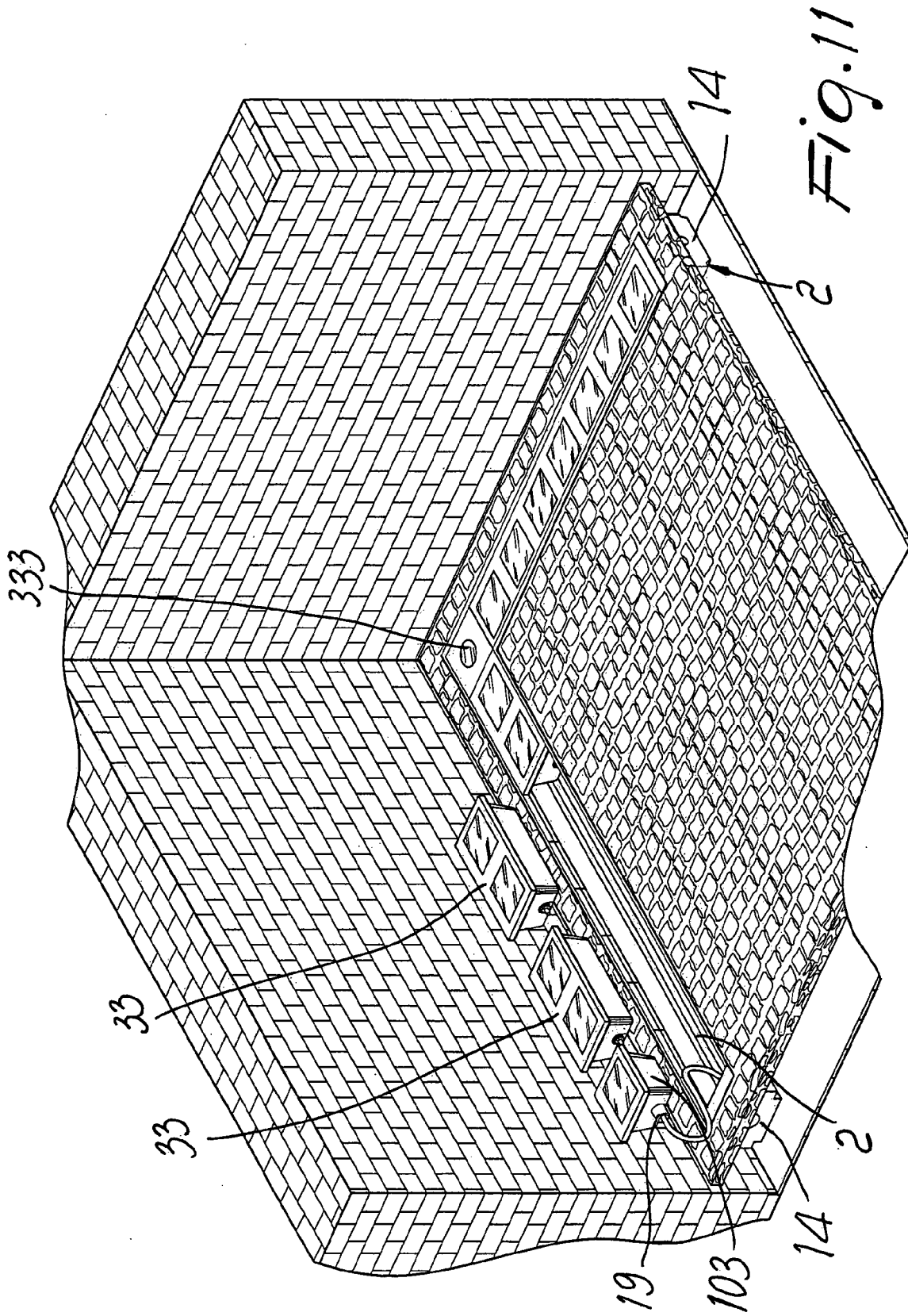


Fig. 10





EUROPEAN SEARCH REPORT

Application Number
EP 09 01 0106

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 201 01 675 U1 (RAUCH GERD [DE]) 20 September 2001 (2001-09-20) * pages 2-7; figures 1-3,10 * -----	1-3,5,6,8	INV. F21S2/00 F21V21/005
A	US 5 226 724 A (KANAREK SHEPARD S [US]) 13 July 1993 (1993-07-13) * paragraphs [0006] - [0012]; figures 1-5,7-9,11-13,20,21 * -----	1-3,6-8	ADD. F21Y101/02
A	US 7 021 786 B1 (SANDOR SR FREDERICK J [US]) 4 April 2006 (2006-04-04) * abstract; figures 1-15 * -----	1,3,6,8	
A	EP 1 884 707 A (TARGETTI SANKEY SPA [IT]) 6 February 2008 (2008-02-06) * paragraphs [0008] - [0014]; figure 1 * -----	1,3-6	
P,A	EP 1 980 785 A (TRILUX GMBH & CO KG [DE]) 15 October 2008 (2008-10-15) * paragraphs [0021] - [0046]; figures 1-11 * -----	1-3,5-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21S F21V H02G E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 September 2009	Examiner von der Hardt, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 01 0106

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21-09-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 20101675	U1	20-09-2001	NONE
US 5226724	A	13-07-1993	NONE
US 7021786	B1	04-04-2006	NONE
EP 1884707	A	06-02-2008	IT FI20060047 U1 28-10-2006
EP 1980785	A	15-10-2008	NONE

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

- IT MI20081531 A [0064]