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(71) Applicant: **Alutec Oy**
84100 Ylivieska (FI)

(72) Inventor: **Salonsaari, Kari**
84100 Ylivieska (FI)

(74) Representative: **Kolster Oy Ab**
Salmisaarenaukio 1
P.O. Box 204
00181 Helsinki (FI)

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(54) **COVER STRUCTURE AND RAILING STRUCTURE**

(57) The invention relates to a cover structure which comprises a cover plate (400) for covering a gap (G) between a vertical face (11) of a balcony slab (10) and a vertical protective plate structure (500) of the balcony railing structure. In the invention, the cover structure comprises, in connection with the cover strip (400), a cover plate (450) located lower in relation to the cover strip, to cover the face (11) of the balcony slab (10) so that the

cover strip (400) and the cover plate (450) in connection therewith are between the cover plate structure (500) and the face (11) of the balcony slab (10) on the front side of the face (11) of the balcony slab (10), to make it possible to adjust the height position and/or inclination position of the entity formed by the cover strip (400) and cover plate (450).

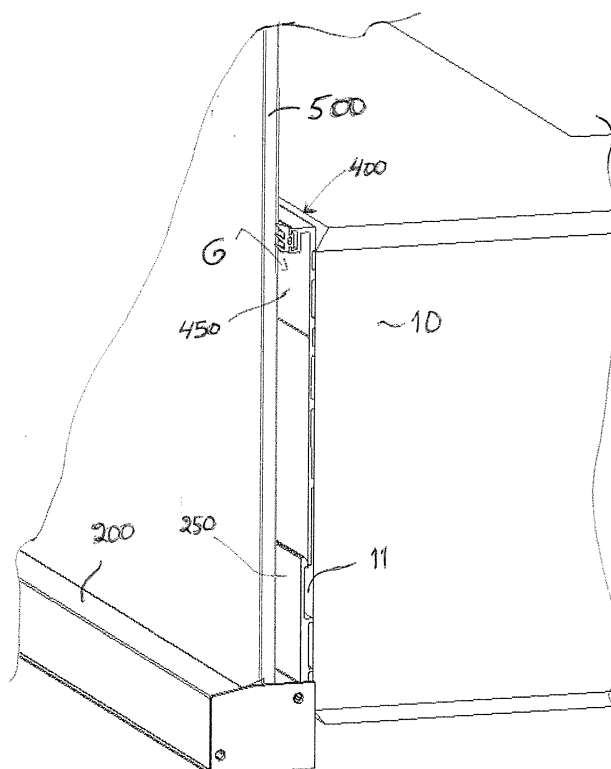


Fig. 2

Description

Field

[0001] The invention relates to a cover structure for a railing structure, and to a railing structure.

Background

[0002] For the sake of safety while being on a balcony, the front edge of a balcony has a railing structure. A railing structure provided with a vertical protective plate also acts as a structure shielding from view and drafts.

[0003] In many cases, a railing structure is at its bottom part supported by a bottom rail, or bottom profile, onto a face of a balcony slab, that is, on the front side of the balcony. A bottom rail, fixed to the face of the balcony slab, supports the protective plate structure which is formed of one or more railing plates or railing glass panes. A top rail, or top profile, is fixed between the side walls of the balcony.

[0004] In an embodiment, the aim is to implement the railing structure without poles, in other words, without vertical poles between the bottom rail and top rail.

[0005] The vertical, heavy protective plate structure is supported by the bottom rail at a small distance from the face of the balcony slab, in which case the gap between an inner surface of the vertical protective plate structure and vertical face of the balcony slab must be coverable so that a user of the balcony will not hurt their feet, specifically the toes, and in addition the need exists to prevent dirt or items from finding their way into the gap. For said purpose, it is known to use a so-called toe strip or similar cover strip.

[0006] In poleless railing structures, a known toe strip is a simple, smooth cover plate which is fastened by its rear edge on the balcony slab and whose front edge extends in the air close to the inner surface of the protective plate structure. When supported on a balcony slab, the known toe strip cannot be easily/neatly installed at a desired height position or inclination by which a potential deviation of the balcony slab from precise horizontalness could be compensated for, because the top surface of the balcony slab determines the position of the toe strip. The need to compensate is due to one edge of a balcony slab possibly being e.g. 15 mm lower or higher than the other edge.

[0007] In addition to covering said gap between the inner surfaces of the protective plate structure and the balcony slab, the need exists to cover the face of the balcony slab, which has previously been done by painting or with a separate cover plate. The need to cover the face of a balcony slab is the greatest when the protective plate structure is of a transparent material, such as clear glass. Due to exposure to weather conditions, the paintwork of the balcony slab begins to peel off or otherwise wear. In the case of a railing structure fastened to a face of a balcony slab, it is difficult to re-paint the balcony slab

because that would require the laborious unfastening and refastening of the railing structure, and would prevent the normal use of the balcony meanwhile.

[0008] Said known solutions in their present form are not satisfactory because they are problematic as concerns the workload in their manufacture, installation and maintenance, as well as in the suitability of the known solutions to the requirements of the installation environment, such the deviation of the balcony slab from exact horizontalness.

[0009] Therefore the need exists for a new kind of cover structure and railing structure.

Brief disclosure

[0010] An object of the invention is to provide an improved solution. This is achieved by a cover structure and railing structure which are characterized by the features disclosed in the characterizing parts of the independent claims. Preferred embodiments of the invention are described in dependent claims. The preferred embodiments enhance the advantages of the basic invention.

[0011] The inventive cover structure and railing structure achieve several benefits, in particular fast manufacturability and easy installability smoothing out the challenges presented by the installation environment, simple maintenance, and good convenience in use.

List of figures

[0012] The invention is now described in closer detail in connection with preferred embodiments and with reference to the accompanying drawings, in which

Figure 1 shows a bottom part of a railing structure, in particular, under a top part of the railing structure, in a situation where a cover strip and cover plate are before their installation lower in the final position, Figure 2 is a view, obliquely from the front, of the structure of the bottom part of the railing structure according to Figure 1, Figure 3 shows the bottom part of the railing structure in a situation where the cover strip and cover plate are in their final position, Figure 4 shows an integrated whole of the cover strip and cover plate from the rear surface side, that is, as seen from the side placed against the face of a balcony slab.

Description of embodiments

[0013] With reference to the Figures, the target of application is a balcony 1 of a building, with a balcony slab 10 which is a balcony slab 10 of suitable strength, either an element or cast in-situ. A vertical face of the balcony slab is denoted by the reference number 11.

[0014] The railing structure RS comprises a bottom

profile 200, or bottom rail 200, fastened on the face 11 of the balcony slab, the fastening utilizing fastening means such as fastening means 202, a plurality of which is needed, because the bottom rail 200 is substantially as long as the width of the balcony.

[0015] In addition, the railing structure comprises a top profile 300, or top rail 300, and the railing structure comprises a cover plate structure 500 consisting of one or more parts. The cover plate structure 500 may be e.g. of so-called railing glass or railing plate.

[0016] The bottom rail 200 and top rail 300 may be e.g. an aluminium strip made by extrusion, such as a profile strip. The bottom rail and top rail are substantially as long as is the width of the balcony, so 300 to 600 cm, for example.

[0017] The invention specifically relates to a cover structure which comprises a cover plate 400 for covering a gap G between a vertical face 11 of a balcony slab 10 and a vertical protective plate structure 500 of the balcony railing structure RS. Furthermore, the cover structure comprises, in connection with the cover strip 400, a cover plate 450 located lower in relation to the cover strip 400, to cover the face 11 of the balcony slab 10. The cover strip 400 for covering the gap G and the cover plate 450 in connection with the cover strip 400 for covering the face 11 are between the cover plate structure 500 and the face of the balcony slab on the front side of the face of the balcony slab, to make it possible to adjust the height position and/or inclination position of the entity formed by the cover strip and cover plate. This is possible because the cover strip 400 for the gap G is not over the balcony slab 10, but the cover strip 400 is supported by the cover plate 450 included in the same entity, and the cover plate 450 and the cover strip 400 supported by it are fastened to the face of the balcony slab through the cover plate by the fastening means 452. Like the bottom rail 200 and top rail 300, the entity formed by the cover strip 400 and cover plate 450 has substantially the same width as the balcony, such as 300 to 600 cm, so a number of fastening means 452 are needed.

[0018] With reference to Figures 1 to 3, in an embodiment the cover strip comprises, at its outer edge, a seal 402 which is arranged to settle regarding the protective plate structures of the balcony railing structure. The base of the seal 402 is within a groove 404 at the outer edge of the cover strip 400, most clearly seen in Figure 4 in which the seal is not in place. With the help of the seal 402 the rattling of the cover strip 400 against the protective plate structure 500 is prevented, and tightness is improved.

[0019] To achieve more diverse and easier adjustability, in an embodiment the cover structure further comprises a lower cover plate 250, which is at the top edge of the bottom rail 200 supporting the cover plate structure 500 of the balcony railing structure from below, in connection with the bottom rail 200. The cover plate 450 in connection with cover strip 400 for the gap G and the lower cover plate 250 at the top edge of the bottom rail

200 in connection with the bottom rail 200 are arranged, in particular according to Figure 3, at least partly in parallel to add to the adjustment potential of the cover strip provided with the cover plate. Figures 1 to 2 do not yet show much parallelism, because the combination of the cover strip 400 and cover plate 450 (which is the upper cover plate) has not yet been pressed or dropped into its final position, shown in Figure 3, where the cover plate 450, or upper cover plate, is in parallel with the lower cover plate 250, which is in connection with the bottom rail 200, for the height of several centimetres.

[0020] Insofar as the bottom rail 200 is concerned, it may be noted that in an embodiment the lower cover plate 250 of the cover structure, in connection with the bottom rail 200 at the top edge of the bottom rail 200, is at the same time a fastening protrusion through which the bottom rail may be fastened by means of the fastening means 202 to the face 11 of the balcony slab. To facilitate manufacturing and installation, as well as to strengthen the fastening of the bottom rail, in an embodiment the lower cover plate 250 in connection with the bottom rail at the top edge of the bottom rail 200 is integral with the bottom rail 200, and of the same material piece with it. Thus, the lower cover plate 250 is formed in the same aluminium extrusion as the remaining structure of the bottom rail, or bottom guide.

[0021] Correspondingly, an embodiment features integrality among the cover strip 400 and cover plate 450, or the upper cover plate 450, that is, so that the cover plate 450 in connection with the cover strip 400 is integral with the cover strip, being of the same material piece with it, and formed e.g. in the same aluminium extrusion. This facilitates manufacturing and installation, as well as strengthens the support of the cover strip 400.

[0022] It may be said that there is a cover plate 450 integrated into the cover strip 400, or the so-called toe strip, and supporting the cover strip 400 included in the entity. It may also be said, in a reversed image manner, that a cover strip 400, or the so-called toe strip, is integrated into the cover plate 450.

[0023] The lower cover plate 250 of the cover structure, at the top edge of the bottom rail 200 in connection with the lower rail, is arranged to support the cover plate 450 in connection with the cover strip 400, and therefore arranged to support the cover strip 400, too.

[0024] Referring to Figure 4, in particular, in an embodiment the cover plate 450 in connection with the cover strip 400 comprises on its inner surface 470, to be placed against the face of the balcony slab, protrusions 471-475 to lean on the face of the balcony slab, and between the protrusions 471-475 the cover plate comprises recesses 481-484 to compensate for potential unevenness of the face of the balcony slab. Below the lowest protrusion 475 and over the highest protrusion 471 there are also recesses 485, 481A, so all the recesses are not necessarily between protrusions, but it may be noted more generally that the recesses are around the protrusions.

[0025] It is seen that the protrusions on the inner sur-

face 470 of the cover plate 450 extend substantially horizontally, which means that the recesses between protrusions are one on the other in relation to each other.

[0026] In an embodiment, the extension of the protrusions 471-475 on the inner surface of the cover plate 450 in relation to recess bottoms comprised by the recesses 481-484 between protrusions is at most 4 mm, the extension of the protrusions being arranged to define the distance of the cover plate in relation to the face of the balcony slab. This way, also major irregularities can be compensated for.

[0027] Insofar as concerns installation, the following is noted:

A hoisting apparatus is used to hoist, up to the balcony, the bottom rail 200, the combination of the cover strip 400 (or toe strip) and cover plate 450, as well as parts of the protective cover plate structure 500.

[0028] The bottom rail 200, or bottom guide, is installed horizontally in its correct position, and it is fastened by a fastening screw 202 through a top skirt/edge of the bottom rail 200, so the lower cover plate 250.

[0029] The combination of the cover strip 400 and cover plate 450 is preliminarily installed in place so that it rests on the bottom rail and is supported by the top skirt of the bottom rail 200, or the lower cover plate 250, that is, the bottom part of the cover plate 450 is placed between the lower cover plate 250 and the face 11 of the balcony slab 10.

[0030] The height position and/or inclination position of the cover strip 400 (with which also the cover plate 450 moves) is adjusted according to the front edge of the balcony slab 10, that is, the potential inclination (deviation from the horizontal) of the balcony slab 10 is compensated for, if e.g. the right edge of the balcony slab 10 is higher or lower than the left edge of the balcony slab 10.

[0031] The cover plate 450 and the cover strip 400 it supports are fastened through the cover plate 450 with a fastening screw 452 to the face 11 of the balcony slab 10.

[0032] Finally, the parts of the protective plate structure 500 are installed to rest on the bottom rail 200, the bottom edge of the protective plate structure 500 is fastened to the bottom rail 200, the top rail 300, or hand guide, is installed in place between the side walls (one side wall W shown) of the balcony with wall fasteners (one wall fastener 310 shown) and the top edge of the protective plate structure 500 is fastened to the top rail 300, or hand guide.

[0033] Even if the top surface of the balcony slab 10 were not entirely horizontal, with the disclosed adjustable toe strip, or cover strip 450 (including the cover plate 450) the situation can be made look better for the balcony user, because the adjustable toe strip, or cover strip, may be adjusted according to the direction of the slab, that is, to imitate the inclination of the balcony slab 10 in relation to the horizontal plane, even if the bottom rail 200 is installed precisely horizontally.

[0034] Those skilled in the art will find it obvious that,

as technology advances, the basic idea of the invention may be implemented in many different ways. The invention and its embodiments are thus not restricted to the above-described examples but may vary within the scope of the claims.

Claims

1. A cover structure which comprises a cover plate (400) for covering a gap (G) between a vertical face (11) of a balcony slab (10) and a vertical protective plate structure (500) of the balcony railing structure, **characterized in that** the cover structure in addition comprises, in connection with the cover plate (400), a cover plate (450) located lower in relation to the cover strip, to cover the face (11) of the balcony slab (10) so that the cover strip (40) and the cover plate (450) in connection therewith are between the cover plate structure (500) and the face (11) of the balcony slab (10) on the front side of the face (11) of the balcony slab (10), to make it possible to adjust the height position and/or inclination position of the entity formed by the cover strip (400) and cover plate (450).
2. A cover structure as claimed in claim 1, **characterized in that** the cover strip (400) comprises, at its outer edge, a seal (402) which is arranged to settle regarding the protective plate structure (500) of the balcony railing structure.
3. A cover structure as claimed in claim 1, **characterized in that** the cover structure further comprises a lower cover plate (250), which is at the top edge of the bottom rail (200) supporting the cover plate structure (500) of the balcony railing structure from below, in connection with the bottom rail (200), and **in that** the cover plate (450) in connection with cover strip (400) and the lower cover plate (250) at the top edge of the bottom rail (200) are arranged at least partly in parallel to add to the adjustment potential of the cover strip (450) provided with the cover plate (450).
4. A cover structure as claimed in claim 1, **characterized in that** cover plate (450) in connection with the cover strip (400) comprises on its inner surface (470), to be placed against the face (11) of the balcony slab (10), protrusions (471-475) to lean on the face (11) of the balcony slab (10), and between the protrusions (471-475) the cover plate (450) comprises recesses (481-484) to compensate for potential unevenness of the face (11) of the balcony slab (10).
5. A cover structure as claimed in claim 4, **characterized in that** the protrusions (471-475) on the inner surface (470) of the cover plate (450) extend substantially horizontally, which means that the recesses (481-484) between protrusions (471-475) are one

on the other in relation to each other.

6. A cover structure as claimed in claim 4 or 5, **characterized in that** the extension of the protrusions (471-475) on the inner surface (470) of the cover plate (450) in relation to recess bottoms comprised by the recesses (481-484) between protrusions (471-475) is at most 4 mm, the extension of the protrusions (471-475) being arranged to define the distance of the cover plate (450) in relation to the face (11) of the balcony slab (10). 5
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7. A cover structure as claimed in claim 3, **characterized in that** the lower cover plate (250), in connection with the bottom rail (200) at the top edge of the bottom rail (200), is at the same time a fastening protrusion through which the bottom rail (200) may be fastened by means of the fastening means (202) to the face (11) of the balcony slab (10). 15
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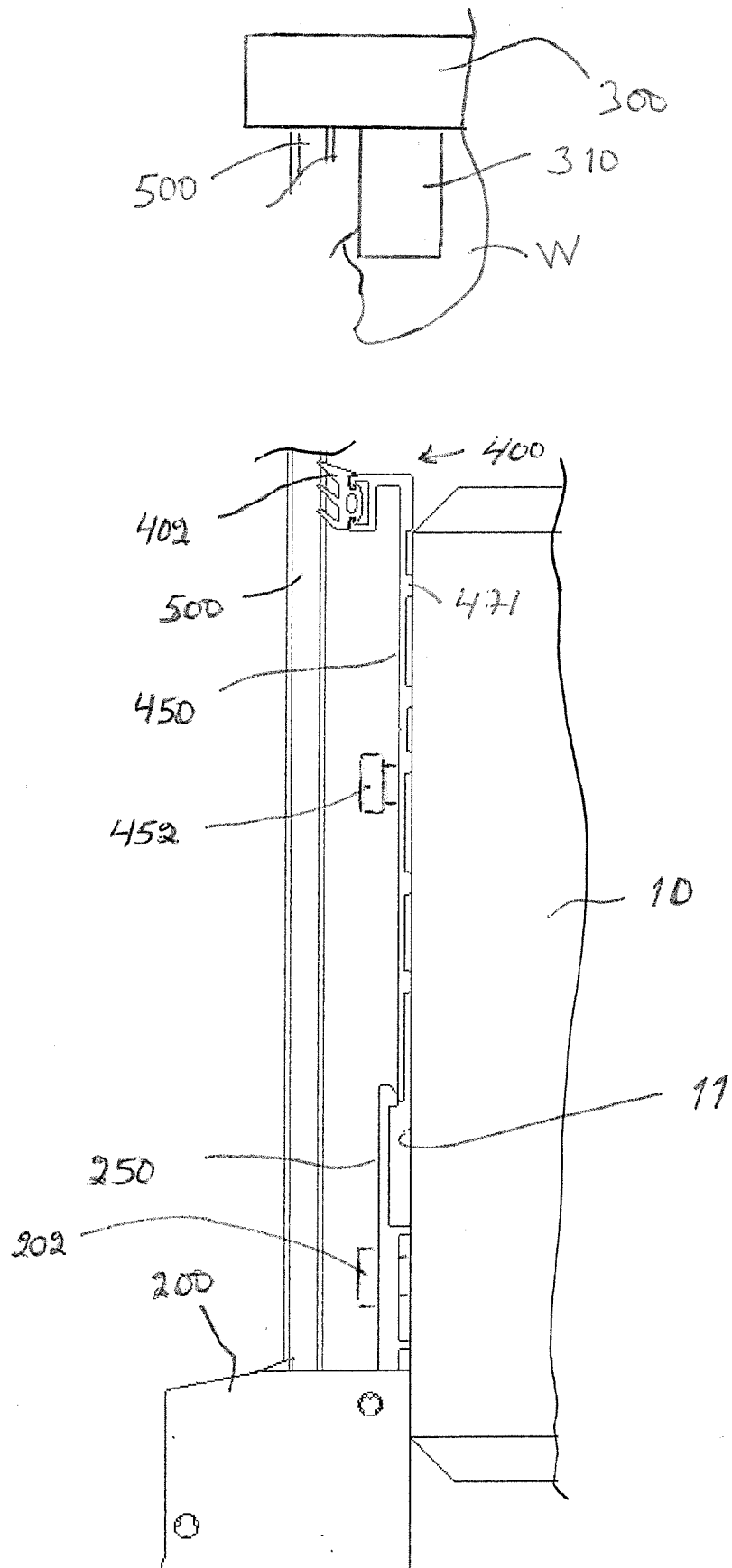
8. A cover structure as claimed in claim 1, **characterized in that** the cover plate (450) in connection with the cover strip (400) is integral with the cover strip (400), being of the same material piece with it. 25

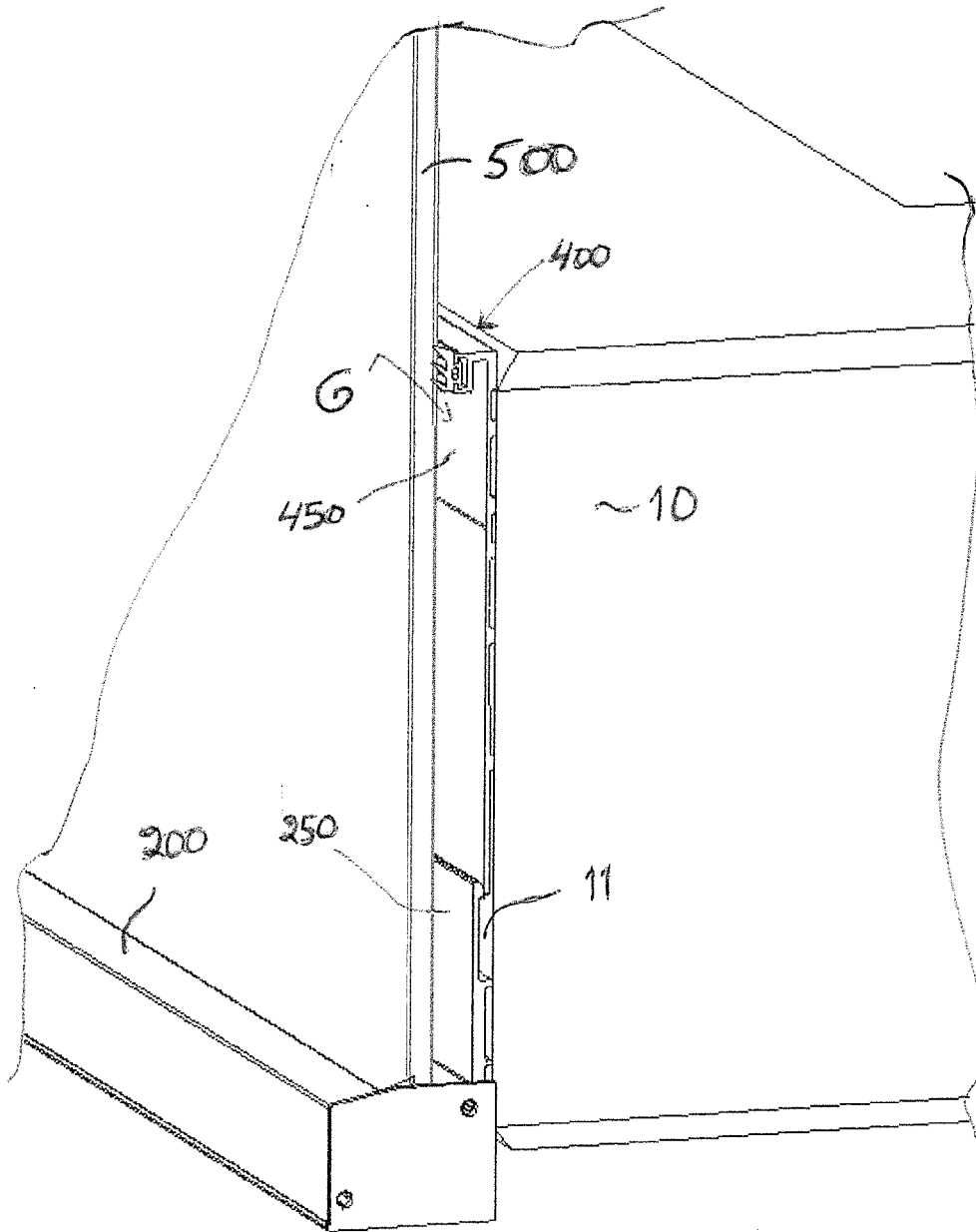
9. A cover structure as claimed in claim 1, **characterized in that** the lower cover plate (250) in connection with the bottom rail (200) at the top edge of the bottom rail (200) is integral with the bottom rail (200), and of the same material piece with it. 30

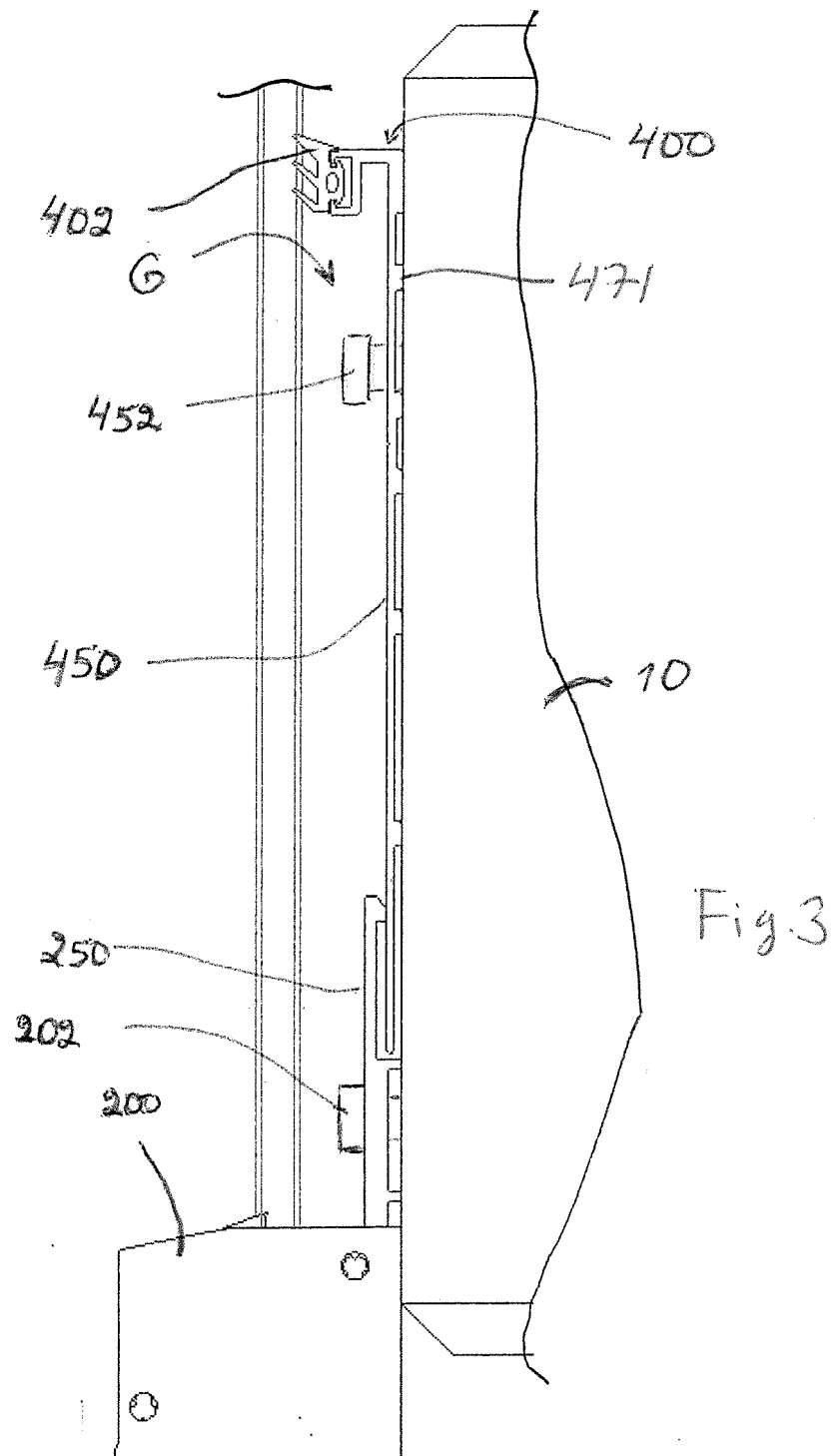
10. A cover structure as claimed in claim 3, **characterized in that** the lower cover plate (250) at the top edge of the bottom rail (200) in connection with the lower rail (200), is arranged to support the cover plate (450) in connection with the cover strip (40), and therefore arranged to support the cover strip (400), too. 35

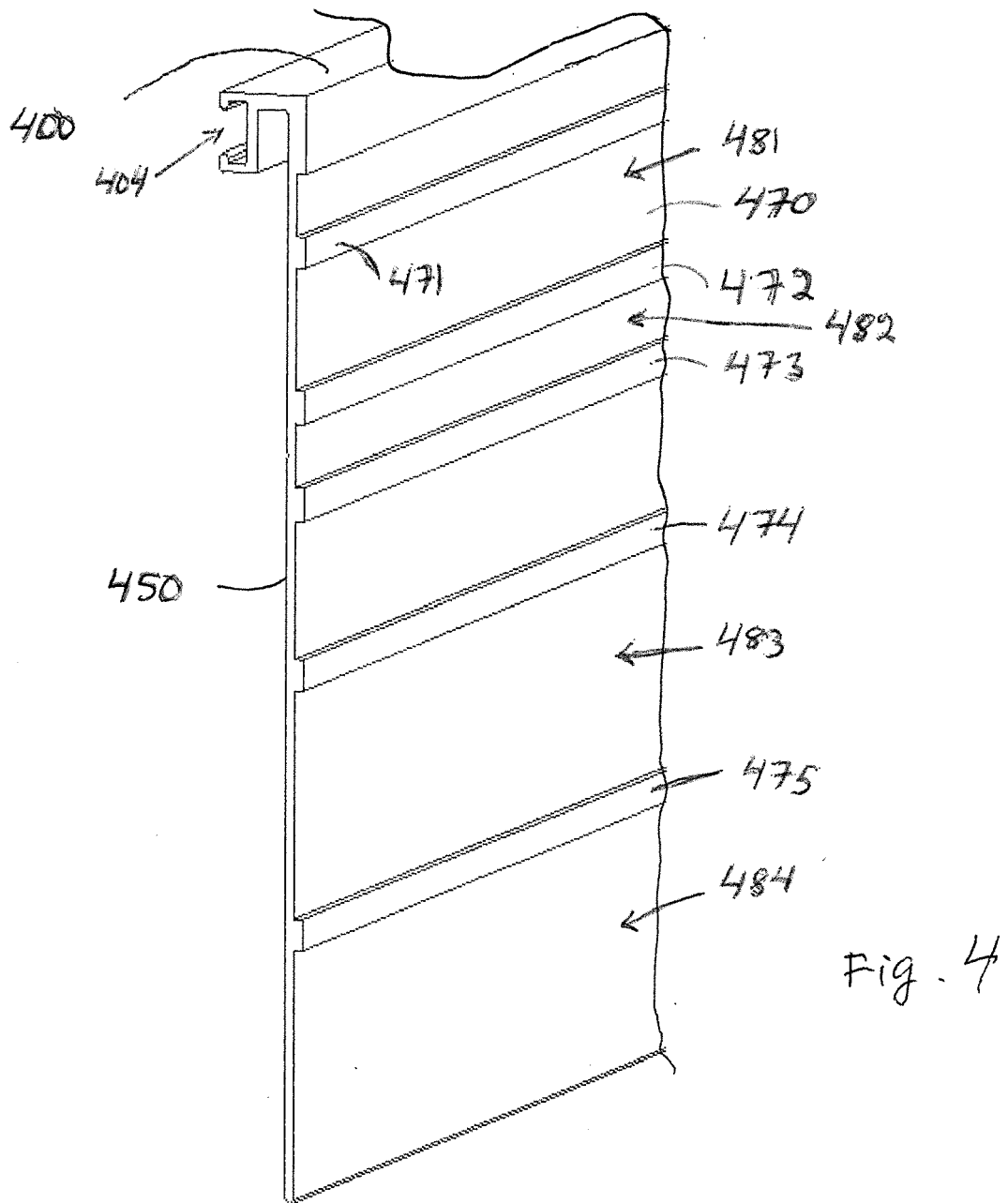
11. A cover structure as claimed in claim 1 or 10, **characterized in that** the cover structure comprises fastening means (452) to fasten the entity formed by the cover strip (400) and cover plate (450) to the face of the balcony slab (10) through the cover plate (450). 40
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12. A railing structure of a balcony, which is a poleless railing structure and comprises a bottom rail (200), top rail (300) and a protective plate structure (500) of the railing structure, and the bottom rail (200) being fastened to a face (11) of a balcony slab (10) and arranged from the lower side to support the protective plate (500) on the front side of the balcony slab (10), **characterized in that** the railing structure comprises a cover structure (400, 450, 250) according to any one of claims 1 to 10. 50
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EUROPEAN SEARCH REPORT

Application Number
EP 20 18 0504

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A	* figures 1-3 *	10	
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	* paragraph [0038] *		TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 October 2020	Examiner Arsac England, Sally
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 20 18 0504

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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27-10-2020

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