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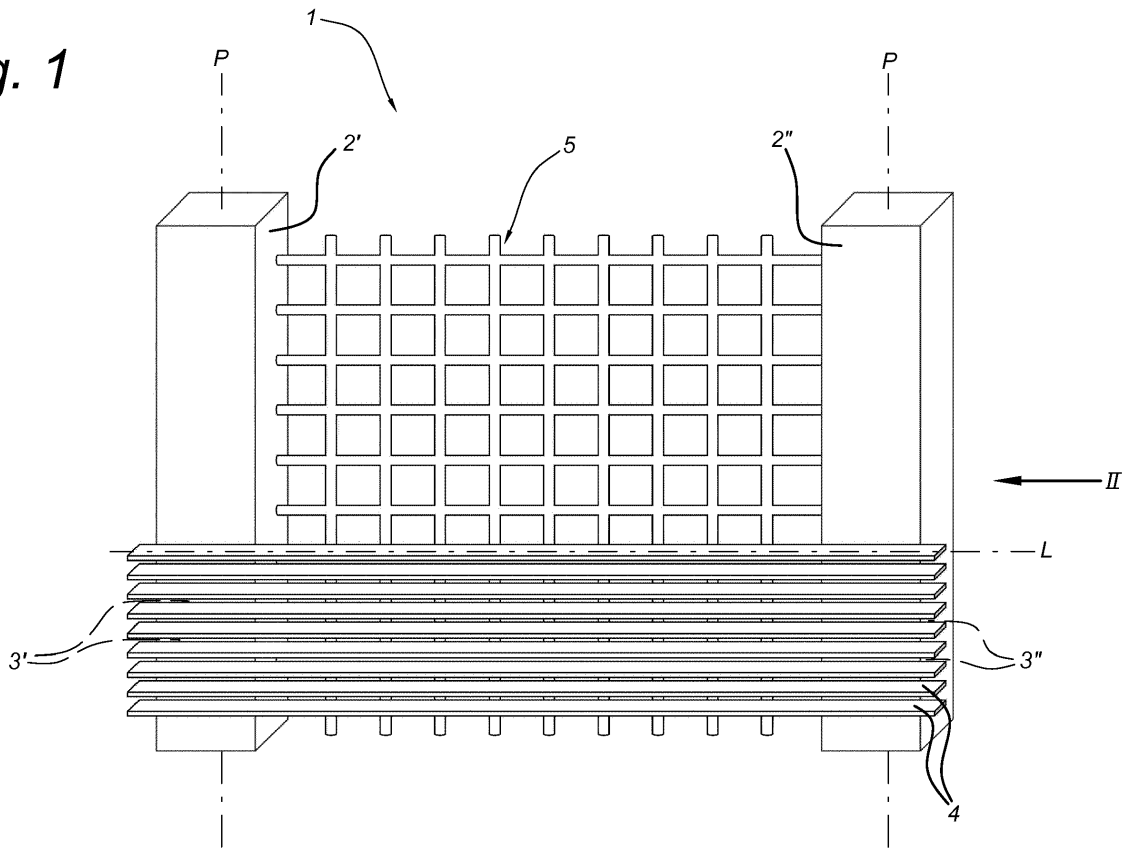
(54) **LOUVRE SYSTEM FOR FACADE CLADDING OF BUILDINGS AND THE LIKE**

(57) The present invention relates to a louvre system for facade cladding comprising at least two mullions for attachment to a facade and a plurality of louvre blades, wherein each louvre blade is supported from the at least two mullions by a respective bracket provided to a respective mullions. The louvre system further comprises a mesh structure positioned in-between, and (directly) connected to, the at least two mullions.

Fig. 1



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Description

Field of the Invention

[0001] The present invention relates to a louvre system for facade cladding comprising at least two mullions for attachment to a facade and a plurality of louvre blades, wherein each louvre blade is supported from the at least two mullions by a respective bracket provided to a respective mullions.

Background

[0002] A louvre system may be used on buildings, e. g. an atrium, to provide for ventilation. It can form part of, or all of, one of more facades and/or the roof of the building. Known louvre systems, for example louvre walls or other louvre facade cladding, are built up of brackets and louvre blades. For the purpose of securing these brackets, a supporting rear construction must be provided, consisting of mullions which may be placed vertically depending on the location and the louvre blade type. After aligning the mullions, the blades may be fastened horizontal to the mullions via the brackets.

[0003] Although the louvre blades are firmly attached to the brackets, and thus to the mullions, it is nonetheless possible to force them out in the event of a break-in attempt. The absence of burglar-resistant measures means that louvre systems are poorly installed.

Object of the Invention

[0004] An object of the invention is to provide an improved louvre system. A further object of the invention may be to provide a burglar-resistant louvre system.

[0005] Another object of the invention may be a method for improving existing louvre systems, in particular the burglar-proofing of existing louvre systems.

Summary of the Invention

[0006] This object is achieved in that the louvre system further comprises a mesh structure positioned in-between, and (directly) connected to, the at least two mullions. Even if the louvre blades were to be removed or destroyed, the presence of the mesh structure between the mullions still makes the passage between these profiles difficult. Thus, the mesh structure may be regarded as burglary resistant measure, i.e. reaching any underlying structure (behind the louvre system) will be impeded by the mesh structure. By securing the mesh structure in-between the at least two mullions, the mesh structure is confined to the space between the at least two mullions. As such the mullions may be directly attached to the underlying structure and the louvres blades may be installed as usual. Advantageously, the louvre system according to the invention is installed compactly.

Furthermore, due to the fact that the mesh structure is attached in-between the at least two mullions, the mesh structure may be installed from the front side. Thus, allowing an easier and more flexible installation of the mesh structure, e.g. the mesh structure may be installed after installing the mullions.

[0007] In a preferred embodiment, the invention relates to a louvre system comprising a first mullion and a second mullion which extend substantially parallel to each other in a mullion direction, brackets provided on the mullions, which brackets protrude relative to the mullions, and louvre blades each supported by at least a first bracket of the first mullion and a second bracket of the second mullion, which louvre blades extend substantially parallel to each other in a louvre blade direction perpendicular to the vertical direction. The louvre system further comprises a mesh structure attached in-between the first mullion and the second mullion.

[0008] Preferably, one or more claws are provided to each mullion by means of which the mesh structure is attached to the mullions. Furthermore, each claw is preferably provided with a cover plate by means of which at least part of the mesh structure is enclosed in the claw. In particular, each cover plate is connected to the corresponding claw via an anti-intrusion screw which counteracts removal of the screw. The anti-burglary screw may be designed as a screw from which the head of the screw is drilled out, so that it later counteracts turning out or a single screw.

The mesh structure may take various forms. The mesh structure may be designed as a single layer or multilayer structure. Preferably, the system will be embodied with a multilayer structure. The multilayer structure may be formed by means of a structure layered in a thickness direction, the thickness direction being determined perpendicular to the vertical direction and the blade direction. The mesh structure may further comprise only one or more mesh elements. Preferably, the mesh structure comprises at least two layers in which the meshes only partially overlap.

[0009] The mesh elements are preferably designed as one or more concrete nets. In particular, the nets have a mesh size of 50 x 50 mm and a wire diameter of 6 mm.

The invention further relates to a Louvre wall or continuous louvre wall comprising one or more louvre blade walls as described above.

Brief description of Drawings

[0010] The invention will be explained in more detail below with reference to drawings in which illustrative embodiments thereof are shown. They are intended exclusively for illustrative purposes and not to restrict the inventive concept, which is defined by the appended claims.

Figure 1 shows in a perspective view a schematic representation of a louvre system according to an embodiment of the invention;

Figure 2 shows a cross-sectional view of the embodiment depicted in figure 1;

Figure 3 shows in a perspective view a schematic representation of a louvre wall comprising one or more louvre systems according to one of the preceding figures;

Figure 4 shows in a perspective view a schematic representation of a mullion of a louvre system in a first step of a method for burglar-proofing the louvre system;

Figure 5A, 5B and 5C show schematic representations of the mullion according to figure 4 in a second step of the method;

Figure 6A, 6B show schematic representations of the mullion according to figure 4 in a third step of the method;

Figure 7A, 7B show schematic representations of the mullion according to figure 4 in a fourth step of the method;

Figure 8 shows in an exploded view a louvre system, without louvre blades and brackets, according to an embodiment of the invention.

Detailed Description of Embodiments

[0011] Figure 1 shows a louvre system 1 comprises a first mullion 2' and a second mullion 2", which extend substantially parallel to each other in a mullion direction P. Provided to the mullions 2', 2" are brackets 3', 3", which brackets 3', 3" protrude with respect to the mullions 2', 2" in a thickness direction D (see figure 2). The lamella wall 1 further comprises louvre blades 4 each supported by at least a first bracket 3' connected to the first mullion 2' and a second bracket 3" connected to the second mullion 2". The louvre blades 4 extend substantially parallel to each other to each other in a blade direction L perpendicular to the mullion direction P and the thickness direction D (see FIG. 2). The slat wall 1 further comprises a mesh structure 5 connected to at least the first mullion 2' and the second mullion 2", as will be further explained below. The mesh structure 5 extends substantially in the blade direction L between the first mullion 2' and the second mullion 2".

[0012] Figure 2 shows an embodiment of the louvre system depicted in Figure 1, in which the mesh structure 5 comprises a plurality of mesh elements 7 which follow substantially parallel to each other in the thickness direction D and/or in the mullion direction P. The mesh elements 7 may extend between the first mullion 2' and the second mullion 2" in the blade direction L and in the mullion direction P. If all mesh elements 7 extend at the most between the first mullion 2' and the second mullion 2 ", than the mesh structure 5 will also extend at the most between the first mullion 2' and the second mullion 2".

In an advantageous embodiment, in which the mesh structure 5 extends at the most between the first mullion 2' and the second mullion 2", the mesh structure may be applied after placement of the mullions and the blades may be provided without problems on the brackets 3.

In the embodiment shown, the mesh structure 5 is designed as a double mesh layer in the thickness direction D, which thickness direction D is directed perpendicularly to the mullion direction P and the blade direction L. Preferably this is a double layer, in which the mesh elements 7 partially overlap.

[0013] Figure 3 shows a louvre wall 10 comprising two louvre systems 1 according to any one of the preceding figures. The louvre wall 10 comprises a first mullion 2', a second mullion 2" and a third mullion 2"', which extend substantially parallel to each other in a mullion direction P. The louvre wall 10 further comprises a mesh structure 5 connected to at least the first mullion 2' and the second mullion 2" and a mesh structure 5 connected to at least the second mullion 2" and the third mullion 2"'. The louvre wall 10 further comprises louvre blades 4 each supported by brackets 3', 3", 3"' connected to a respective mullion 2', 2", 2"'.

[0014] Figure 4 shows a schematic view in perspective of a mullion 2 in a slat wall 1 according to Figure 1 in a first step of a method for burglar-proofing the slat wall 1. In the first step of the method, one or more of the mullion 2 brackets 3 connected to support the louvre blades 4. The mullion 2 is provided with brackets 3, which bracket 3 protrudes with respect to the mullion 2 in the thickness direction D. Each bracket 3 is adapted to receive a blade 4, which blade 4 extends with respect to the mullion 2 in the blade direction L.

[0015] Figures 5A and 5B show respectively in perspective and cross-sectional view the mullion 2 according to figure 4 in a second step of the method. In the second step of the method, one or more claws 6 are connected to the mullion 3 in order to connect the mesh structure 5 to the mullion 2. The one or more claws 6 are connected to the mullion 2 by means of a bolt connection consisting of a bolt 11, a washer 12 and a nut 13.

The mullion 2 is provided with claws 6, which claws 6 protrude with respect to the mullion 2 in the blade direction L. Each claw 6 is adapted to receive the mesh structure 5, which mesh structure 5 extends in the direction of a second mullion 2" (not shown). Figure 5C shows the mullion according to figures 5A and 5B attached to a rear structure 14 with fastening means 15.

Figures 6A and 6B show schematic views of the mullion according to figure 4 in a third step of the method, respectively in a view in perspective and in a plan view. In the third step of the method, one or more mesh elements 7' , 7" , 7"' of the mesh structure 5 are arranged in each jaw 6.

The mesh structure 5 is designed as a structure which is layered in the thickness direction D, wherein a first mesh layer comprises one or more mesh elements 7' , 7"' and a second mesh layer comprises one or more mesh elements 7". The mesh structure 5 is further embodied as a staggered structure whose mesh elements 7' , 7" , 7"' in successive mesh layers overlap at the most partially. The first mesh element 7' in the first mesh layer

partly overlaps with the second 7" in the second mesh layer. The third mesh element 7"'in the first mesh layer partly overlaps with the second 7" in the second mesh layer. The mesh elements 7' , 7" , 7''' are arranged in the claw 6 so that both overlapping parts may be enclosed in the claw.

[0016] Figs. 7A and 7B show schematic views of the mullion according to Fig. 4 in a fourth step of the method, respectively in a perspective view and in a front view. In the fourth step of the method, each jaw 6 is closed with a cover plate 8 in order to confine the part of the mesh structure 5 arranged in the claw into the jaw 6.

Each cover plate 8 may be connected to the corresponding jaw 6 by means of an anti-burglar screw 9 which counteracts the unscrewing. The cover plate 8 is arranged substantially parallel to the mesh structure 5 in the claw 6. The cover plate 8 and the corresponding claw 6 enclose the mesh structure 5 in a space defined by the cover plate 8 and the claw 6. Because the cover plate 8 is connected to the claw 6, a tight unit is formed, which is not easy to remove for the sake of the anti-burglar screw 9.

Figure 8 shows an embodiment of a blade wall 1, not shown are the blade carriers 3 and bladeblades 4. In the embodiment shown, the mesh structure 5 is designed as a structure which is layered in the thickness direction D, wherein a first mesh layer comprises several mesh elements 7' and a second mesh layer comprises an equal number of mesh elements 7". The layered structure furthermore comprises a third mesh layer, of which each mesh element 7''' with at least two mesh elements 7" of the second mesh layer at most partially overlaps.

The mesh elements 7' of the first mesh layer are arranged in claws 6 such that they may be enclosed in the claw. Each mesh element 7" of the second mesh layer has the same size and shape as an overlapping mesh element 7' of the first mesh layer. In the mullion direction P, the extreme mesh elements 7" of the second mesh layer are connected to a cover plate 8 for closing the extreme claws 6 connected to the mullions 2', 2". As a result, the first and second mesh layers are also trapped in the claw. The mesh elements 7''' are arranged on the second mesh layer in such a way that they overlap at least partially with at least two mesh elements 7'' of the second mesh layer. The mesh elements 7'" of the third mesh layer are furthermore provided with cover plates 8 for closing off the remaining claws.

Optionally, there may be several mesh layers between the first mesh layer and the second mesh layer.

Other alternatives and equivalent embodiments of the present invention are conceivable within the idea of the invention, as will be clear to the person skilled in the art. The scope of the invention is limited only by the appended claims.

Claims

1. Louvre system for facade cladding, comprising:

   at least two mullions (2, 2', 2"); and
   a plurality of louvre blades, wherein each blade (4) is supported from the at least two mullions (2, 2', 2") by a respective bracket (3, 3'; 3") provided to a respective mullion (2, 2', 2"),

   characterized in, that the louvre system (1) further comprises a mesh structure (5) positioned in-between, and connected to, the at least two mullions (2, 2', 2").

2. Louvre system (1) according to claim 1, wherein the at least two mullions (2, 2', 2") extend substantially parallel to each other in a mullion direction (P), and wherein the blades (4) extend substantially parallel to each other in a blade direction (L) perpendicular to the mullion direction (P).

3. Louvre system (1) according to according to one of the preceding claims, in which one or more claws (6) are provided to each mullion (3, 3 ', 3 ") by means of which the mesh structure (5) is attached to the mullions (2, 2', 2").

4. Louvre system (1) according to claim 3, wherein each claw (6) is provided with a cover plate (8) by means of which at least part of the mesh structure (5) is enclosed in the claw (6).

5. Louvre system (1) according to claim 4, wherein each cover plate (8) is connected to the corresponding claw (6) via an anti-intrusion screw (9) which counteracts removal of the screw.

6. Louvre system (1) according to one of the preceding claims, wherein the mesh structure (5) comprises at least one security mesh (7', 7", 7'''), preferably a stainless steel security mesh.

7. Louvre system (1) according to one of the preceding claims, wherein the mesh structure (5) comprises a plurality of meshes (7', 7", 7''').

8. Louvre system (1) according to one of the preceding claims, wherein the mesh structure (5) is a layered structure in a thickness direction (D) that is perpendicular to the mullion direction (P) and the blade direction (L).

9. Louvre system (1) according to claims 7 and 8, wherein the mesh structure (5) comprises at least two layers in which the meshes (7', 7", 7''') only partially overlap.

10. Louvre system (1) according to one of the preceding claims, the meshes (7', 7", 7"') having a mesh size of 50 x 50 mm and a wire diameter of 6 mm.

11. Louvre wall or continuous louvre wall comprising at least one louvre system according to one of the preceding claims.

12. Method for installing a louvre system (1) comprising at least two mullions (2, 2', 2") and a plurality of louvre blades (4),
characterized by, installing a mesh structure (5) in-between the at least two mullions (2, 2', 2").

13. Method according to claim 12, wherein the installation step comprises connecting the mesh structure (5) to each mullions (2, 2', 2 ") by means of one or more claws (6).

14. Method according to claim 13, wherein at least a part of the mesh structure (5) is enclosed in each claw (6) by means of a cover plate (8), preferably each cover plate (8) is secured to the corresponding claw (6) by means of anti-intrusion screw (9).

15. Method according to any one of claims 12-14, further comprising the step of attaching the at least two mullions (2, 2', 2") to a facade before, installing the mesh structure (5).

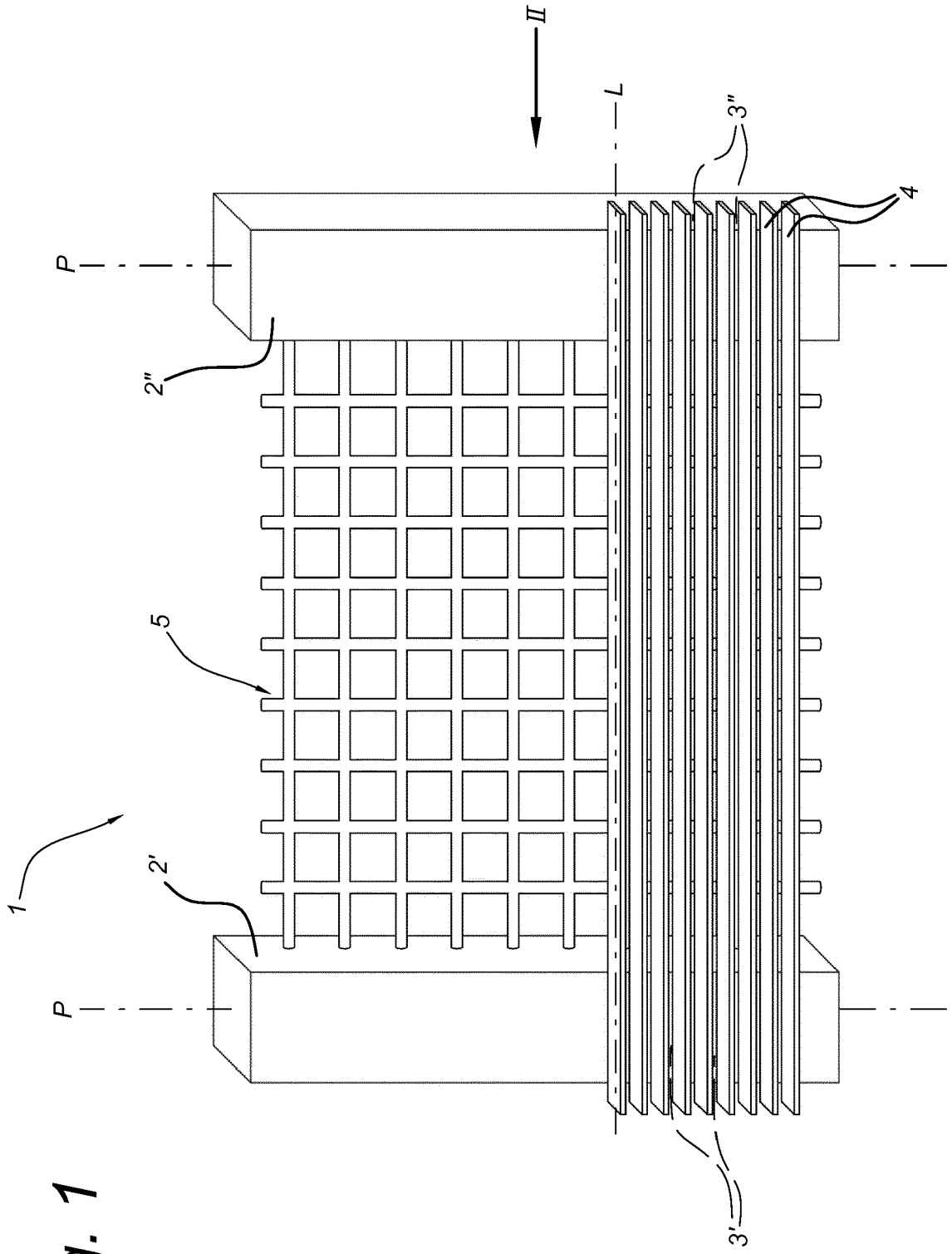


Fig. 1

Fig. 2

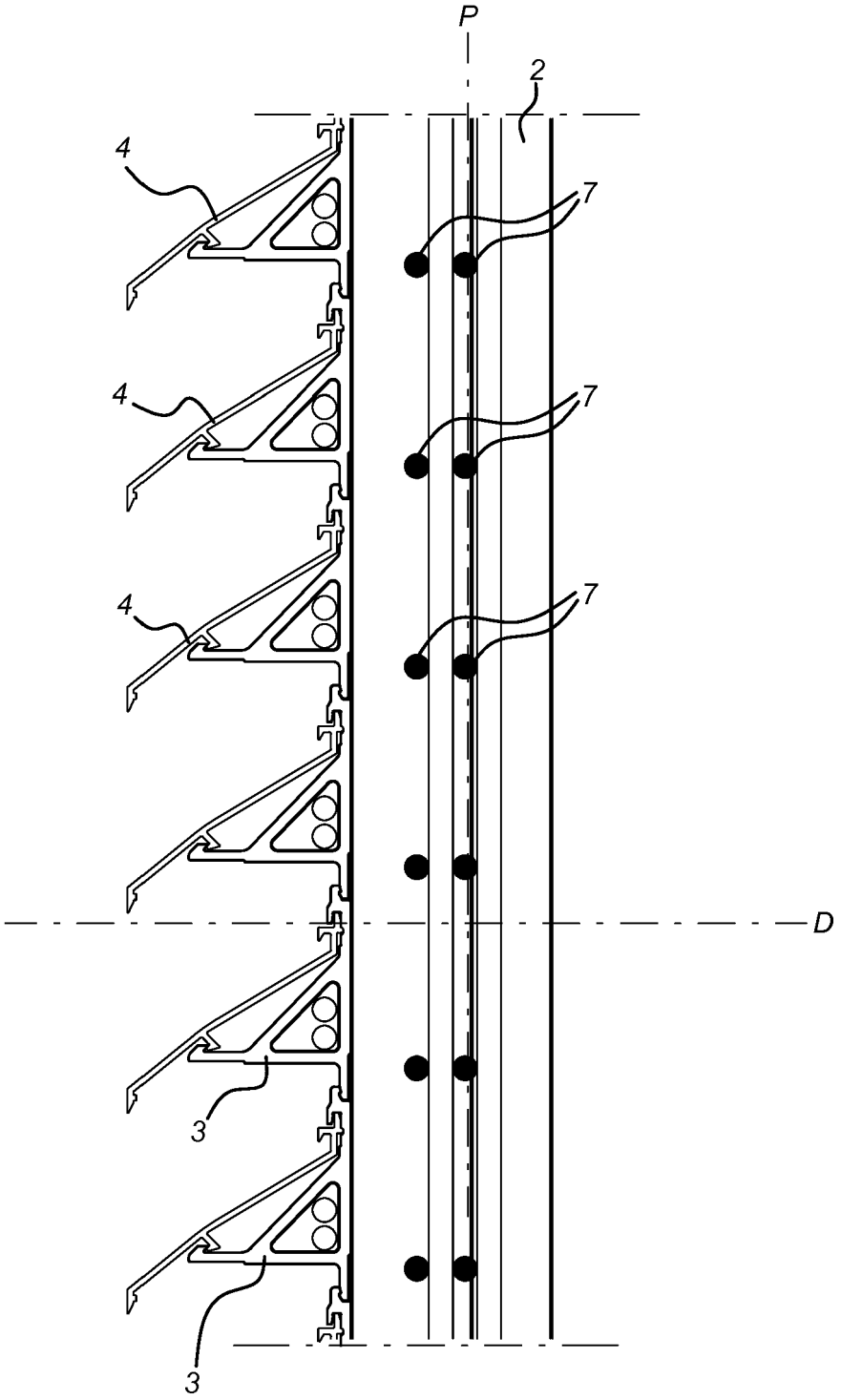


Fig. 3

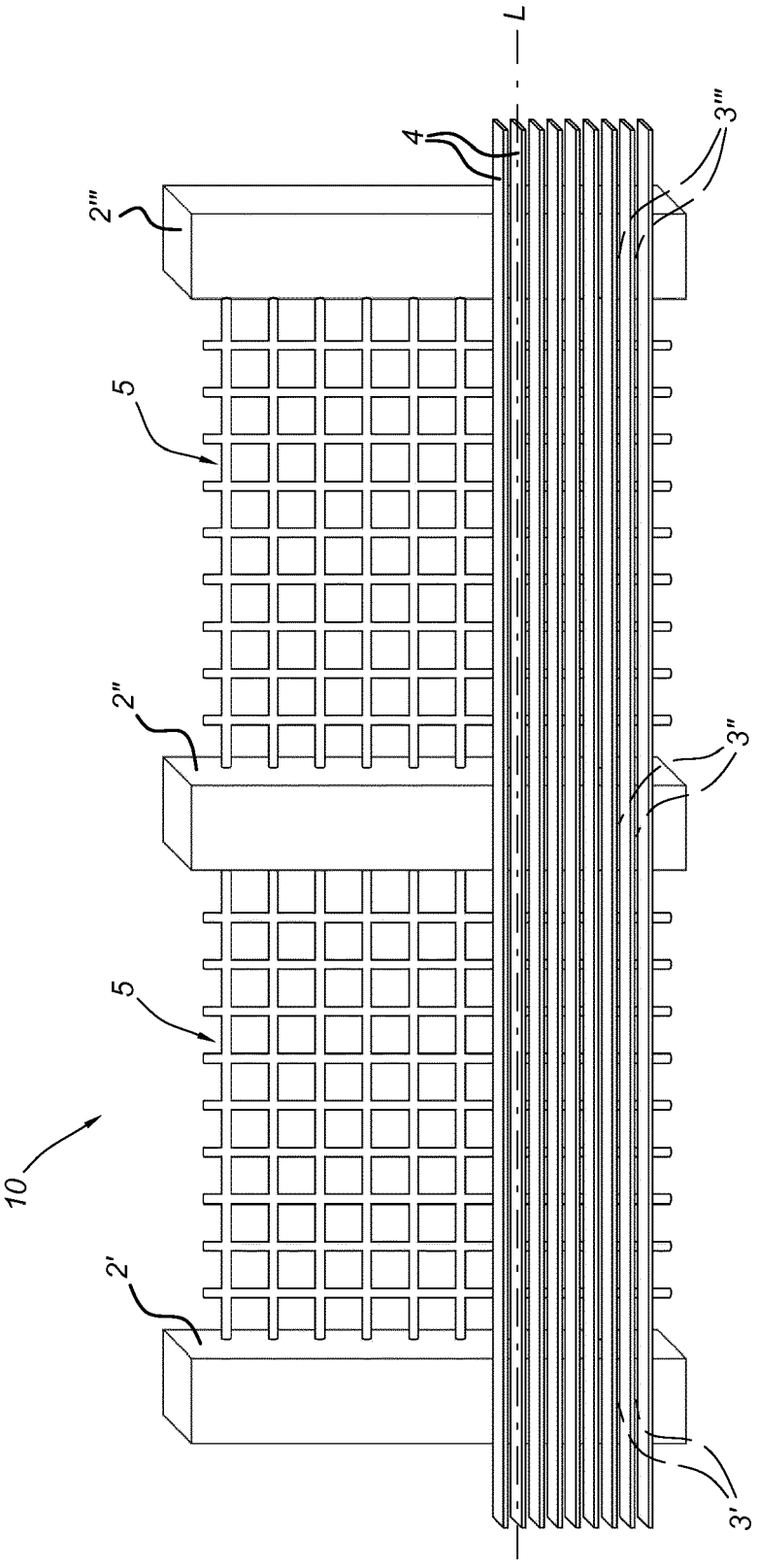


Fig. 4

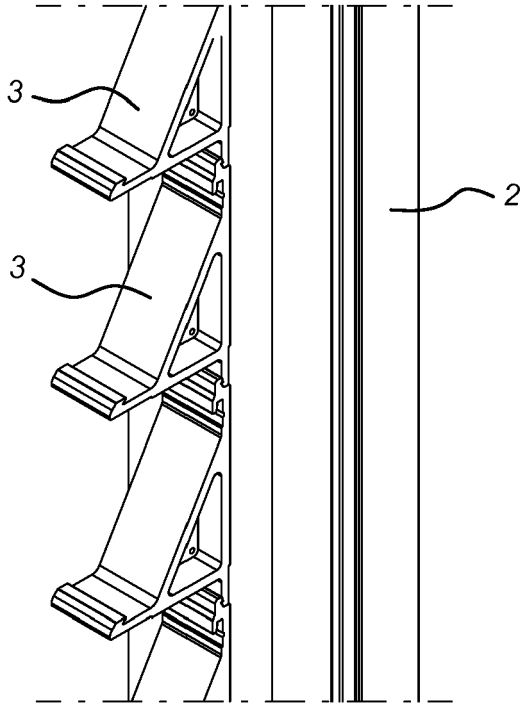


Fig. 5A

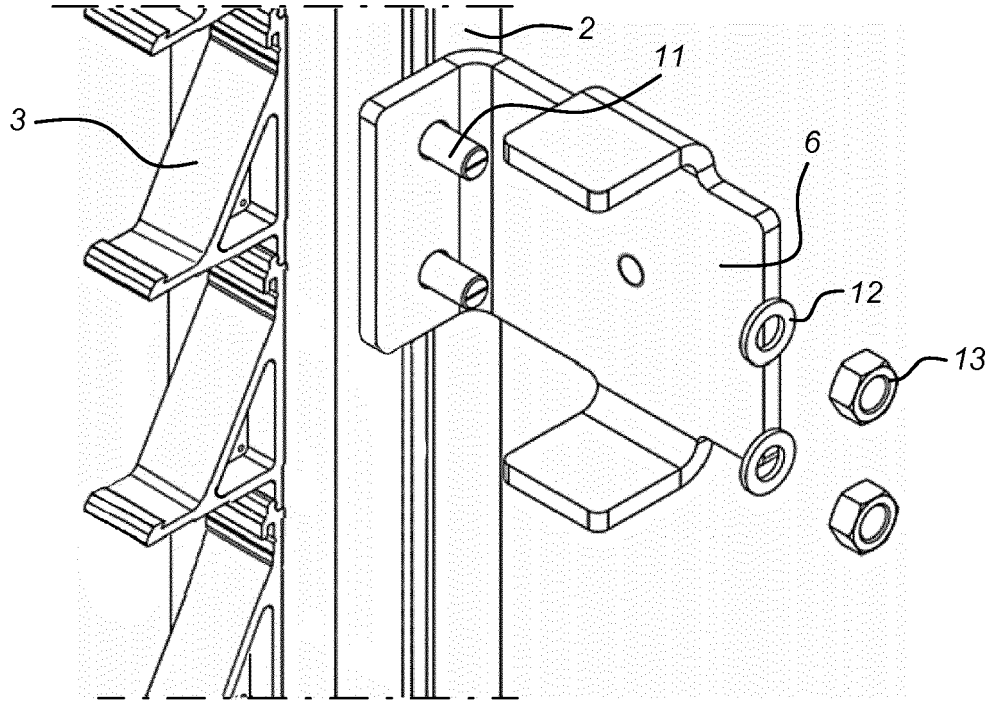


Fig. 5B

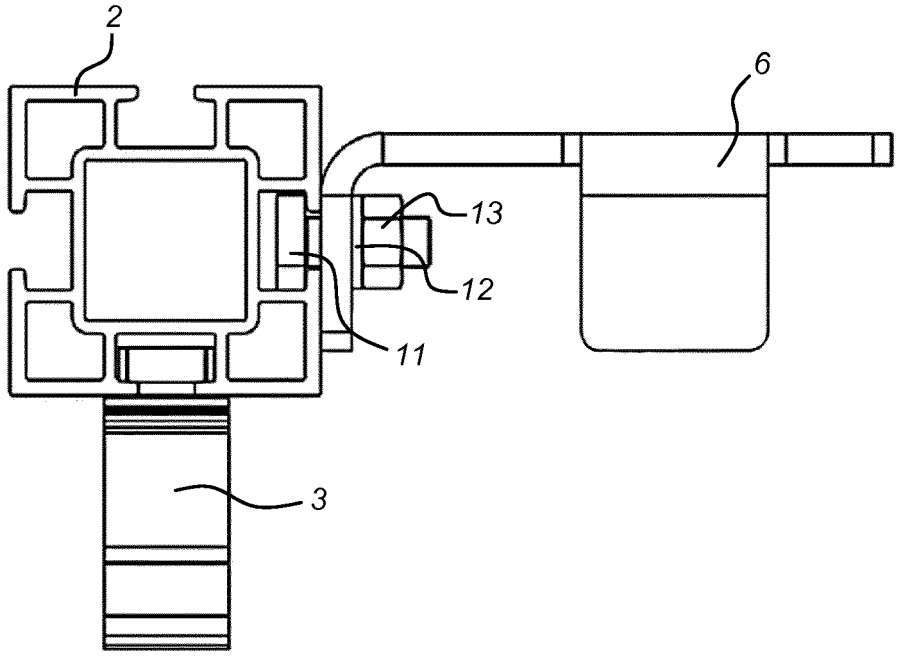


Fig. 5C

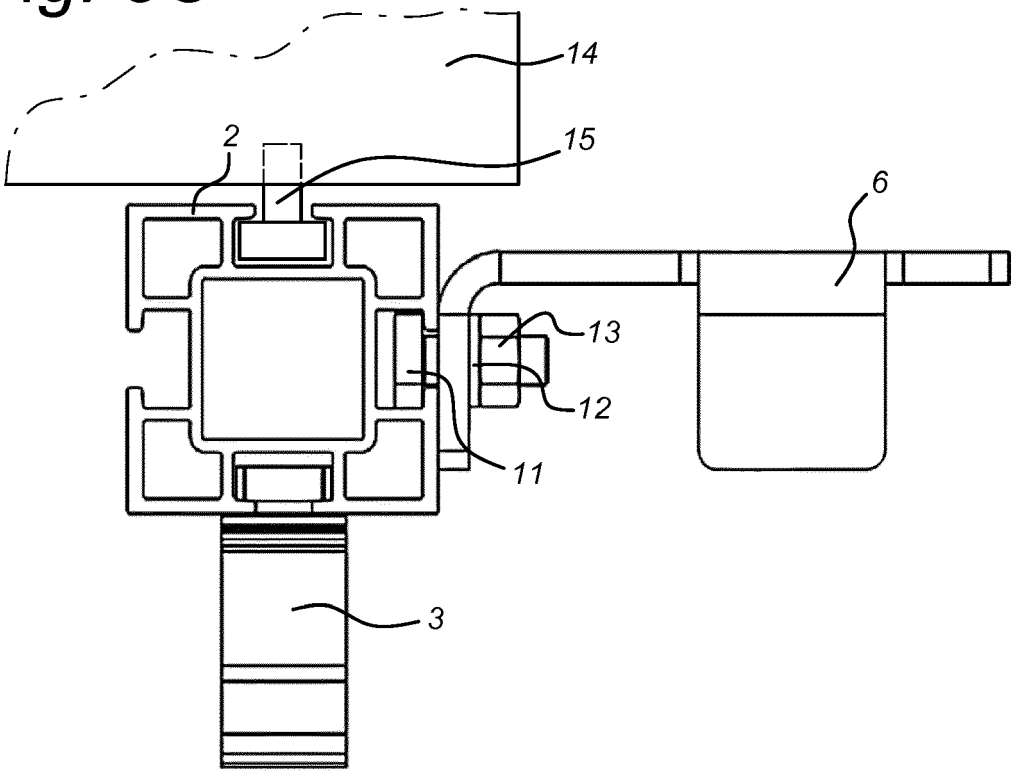


Fig. 6A

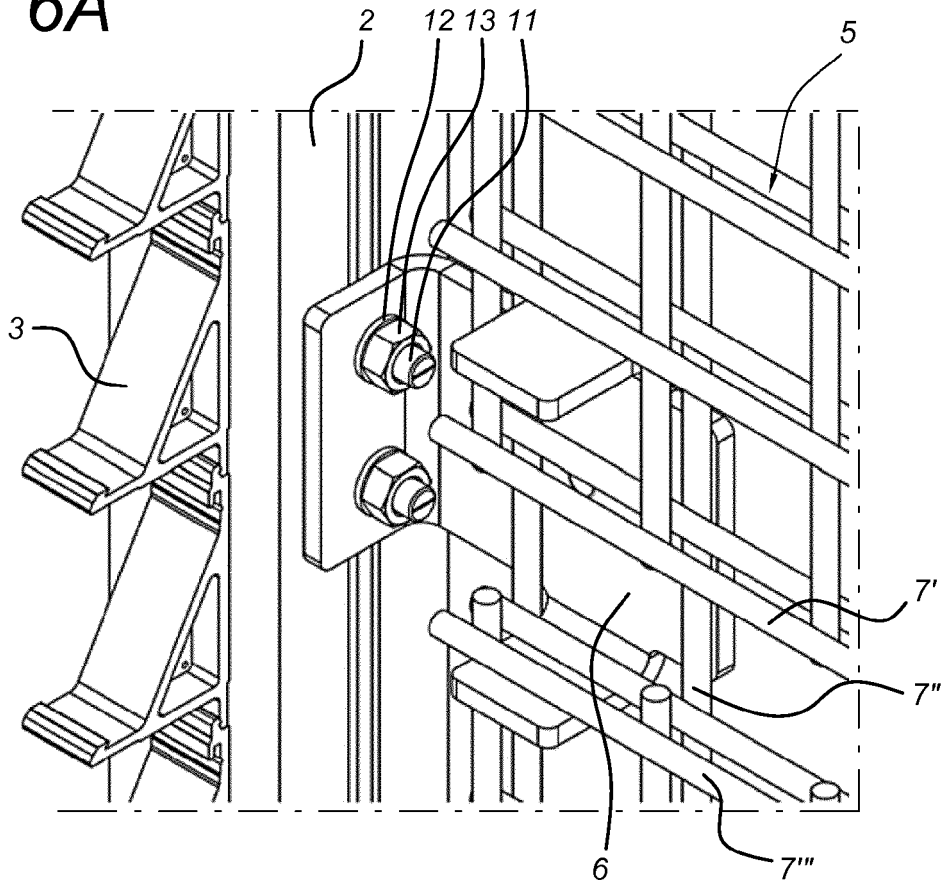


Fig. 6B

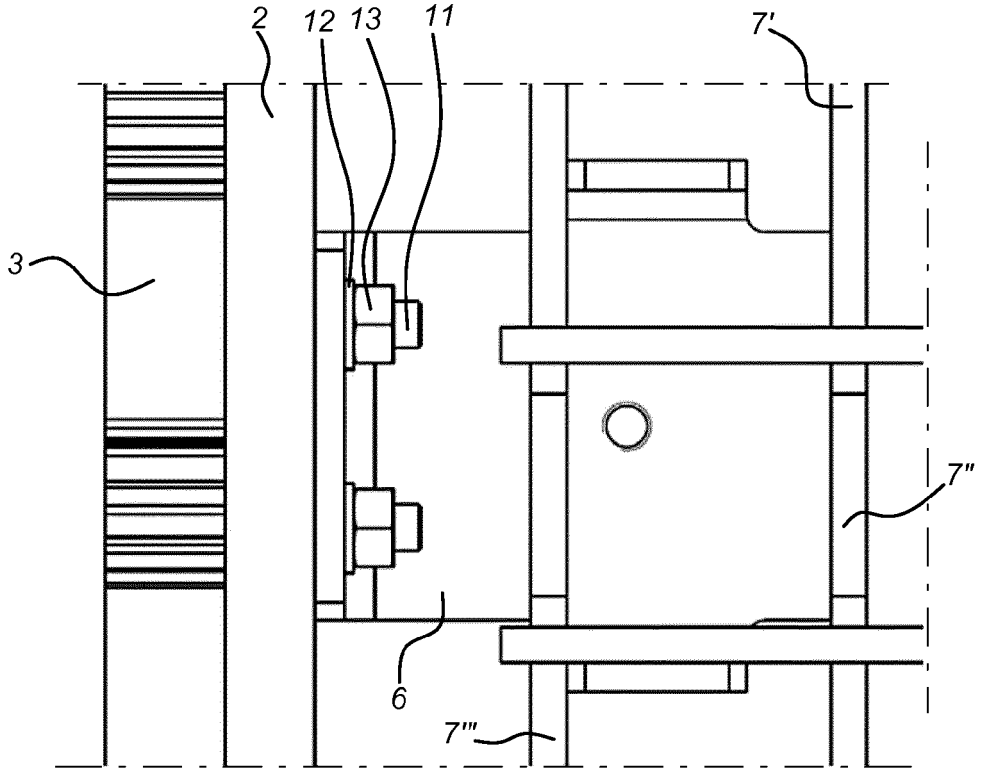


Fig. 7A

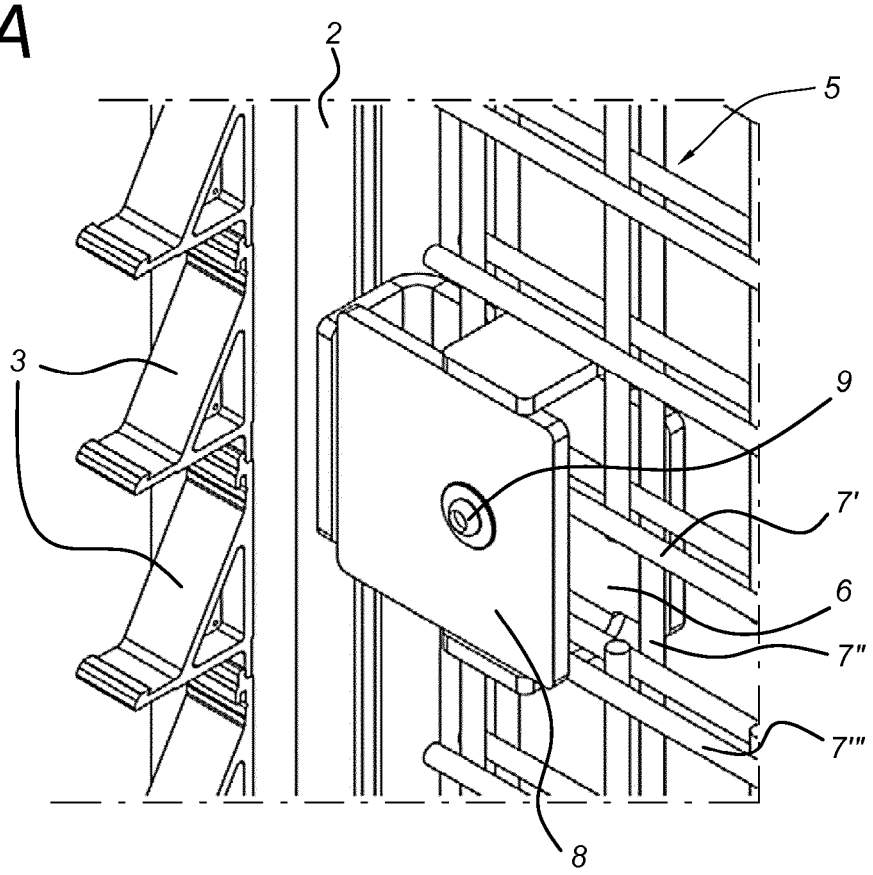


Fig. 7B

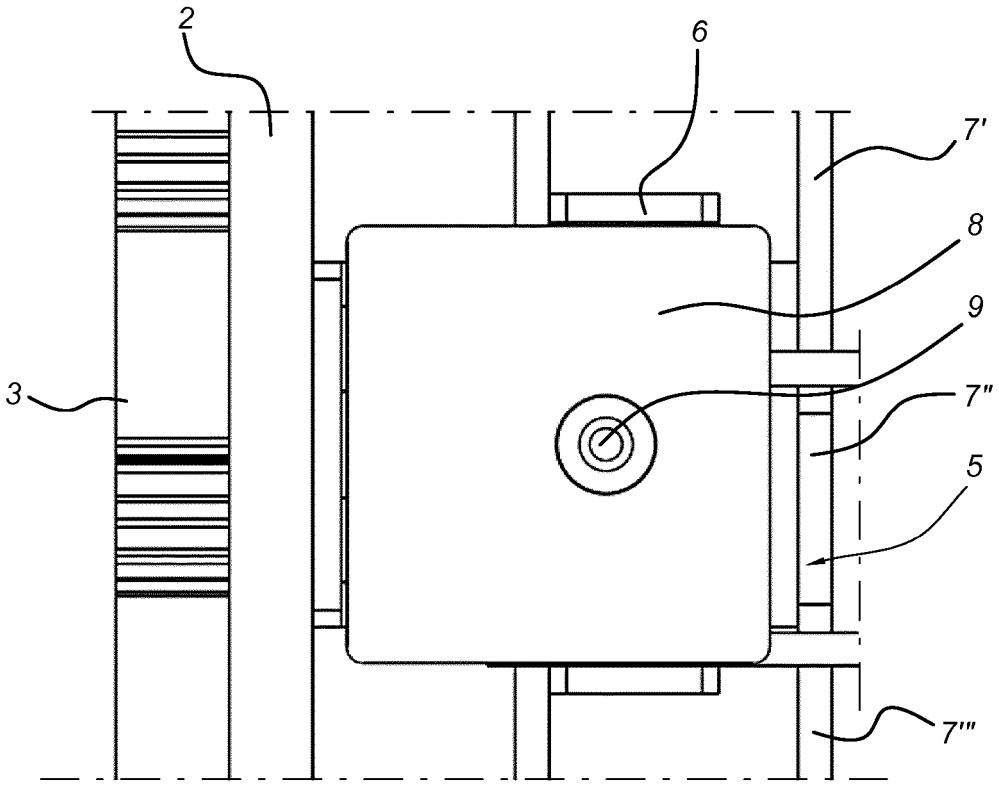
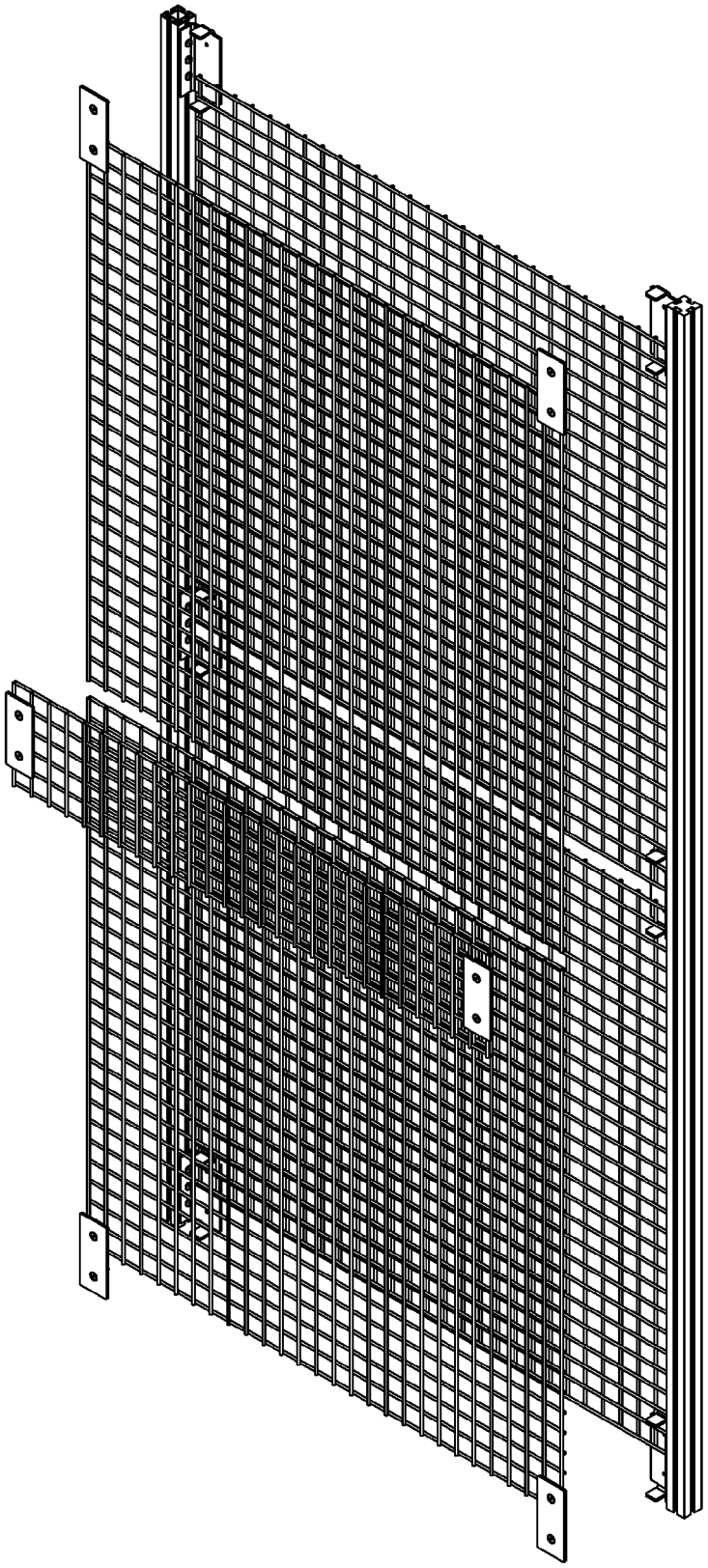


Fig. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 18 18 3918

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 242 735 A (TEK GROUP LIMITED [GB]) 9 October 1991 (1991-10-09) * page 3, line 26 - page 4, line 29 * * page 6, lines 1-6 * * figures * -----	1-8, 10-15	INV. E06B7/02 E06B9/26 F24F13/08
X	WO 2005/049950 A1 (SNAP OUT SCREENS AUSTRALIA PTY [AU]; AURET DEREK MICHAEL [AU]) 2 June 2005 (2005-06-02) * abstract; figures * -----	1-6, 8-10, 12-15	
X	US 2 962 137 A (FRANK MILAVEC) 29 November 1960 (1960-11-29) * column 1, lines 15-20 * * column 2, lines 31-39 * * column 3, lines 11-28 * * figures 1,3 * -----	1-6,8, 11-15	

TECHNICAL FIELDS SEARCHED (IPC)

E06B
F24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 December 2018	Gallego, Adoración

CATEGORY OF CITED DOCUMENTS

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03-12-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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WO 2005049950 A1	02-06-2005	NONE	
US 2962137 A	29-11-1960	NONE	

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