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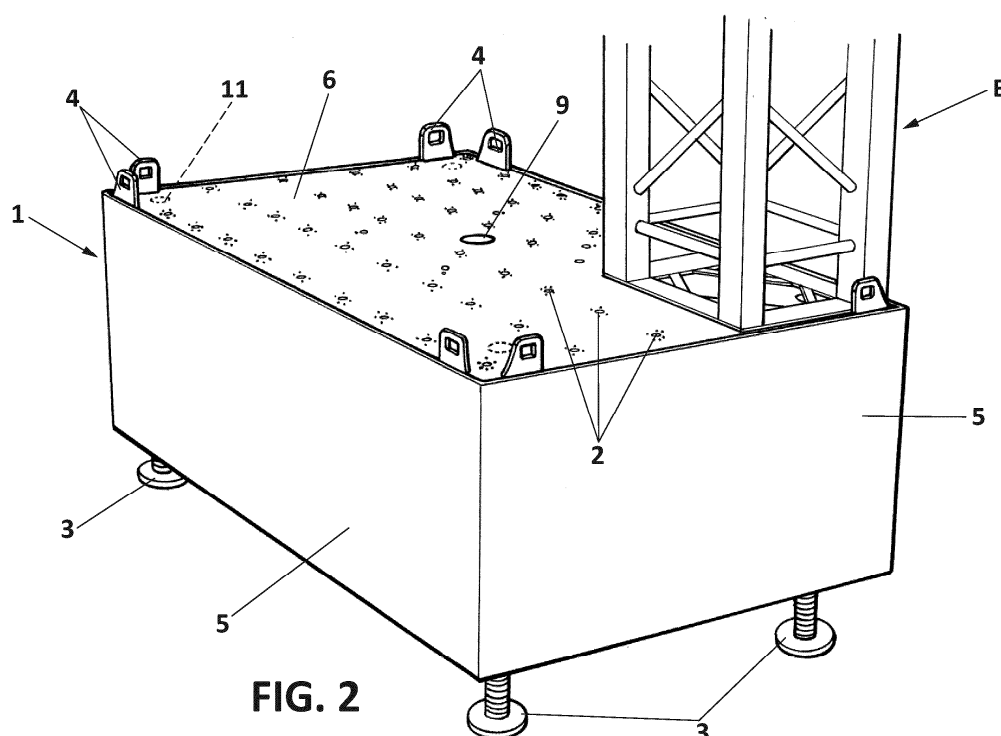
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(54) COUNTERWEIGHT ELEMENT FOR ASSEMBLY OF TEMPORARY STRUCTURES

(57) A counterweight element for use in the assembly of temporary structures (E), designed to provide stabilisation against dynamic and static loads. It comprises a prismatic base (1) with side faces (5), upper face (6) and lower face (7), which delimits an internal core (8) intended to house a filling element, such as concrete or water. The upper face (6) incorporates anchorage points (2) for coupling with temporary structures (E), including truss or Layher® type configurations. From the lower face (7)

projecting legs (3) are height adjustable by means of a threaded rod (10) that can be moved in an adjustment channel (11). The base (1) includes supports (4), preferably lugs, located near the corners of the upper face (6), which facilitate gripping and transport. Optionally, it incorporates a through housing (9) between the upper face (6) and the lower face (7). The base (1) can be made of iron with a rectangular prismatic geometry.

**FIG. 2****EP 4 682 331 A1**

Description

OBJECT OF THE INVENTION

[0001] The present invention falls within the technical field of metallic structures and refers in particular to a counterweight element designed to be used in the assembly of temporary structures, which do not usually have foundations.

BACKGROUND OF THE INVENTION

[0002] Temporary metal structures, such as concert stages, festivals and fairs, face a number of critical challenges related to stability and safety. These structures must withstand significant dynamic and static loads, including the weight of equipment, vibrations caused by stage activity, and adverse weather conditions such as wind. The stability of these structures is crucial to avoid collapses that can result in property damage and personal injury.

[0003] Today, several methods are employed to ensure the stability of these temporary structures. The most common methods include the use of counterweights, anchors and bracing structures. Traditional counterweights are usually made of heavy materials such as concrete or steel and are strategically placed to counteract the forces acting on the structure. However, there are several drawbacks to these methods. Concrete counterweights, for example, are bulky and difficult to transport and install. In addition, the precise placement of these counterweights requires time and skilled labour.

[0004] Another method used is to anchor structures to the ground using ground stakes or bolts. While effective, this approach may not be feasible in all terrains, especially in urban areas where the ground surface may be paved or in rocky terrain where anchoring is difficult. In addition, the installation and removal of anchors can cause damage to the ground and can be a laborious task.

[0005] Reinforcement structures, such as support bars and additional beams, are also used to improve stability. However, this method can significantly increase the weight and complexity of the structure and requires careful design and planning to be effective.

[0006] Despite these existing methods, there remains a need for more effective and efficient solutions for stabilising temporary metal structures. The presented invention proposes a new type of counterweight element that addresses the problems associated with traditional methods, providing a more practical and versatile solution for the erection of temporary structures in a variety of environments and conditions.

[0007] On the other hand, in the technical field of building construction, a structure composed of interconnected linear elements that form a rigid and stable unit is known as a truss. Trusses are widely used in construction and structural engineering because of their ability to carry large loads and span long distances without the need for

intermediate supports. A typical truss is composed of three types of elements: top and bottom chords, which form the upper and lower boundaries of the structure, and diagonal and vertical members, which connect the chords and help distribute loads. Modular trusses are relatively easy to assemble and disassemble, which makes them very suitable for temporary applications such as concert stages, trade fairs and exhibitions.

DESCRIPTION OF THE INVENTION

[0008] The object of the invention consists of a counterweight element for assembly of temporary structures, configured to be used with the main temporary metal structure systems most commonly used today, such as the aforementioned trusses or those manufactured by the firm Layher®.

[0009] For this purpose, the counterweight element basically comprises a base, anchors to allow the coupling between the base and the metallic structure, adjustable legs to ensure correct support, and supports for gripping and transporting the assembly.

[0010] The base, of closed prismatic geometry, comprises an inner core, delimited by the lateral faces of the prism. The inner core can be filled with a heavy element such as water or concrete.

[0011] The level of filling of the inner core depends on the desired counterweight effect. For example, in the case of concrete fillings, counterweights with total masses of 250, 300, 500 and 1000 kg are foreseen. In the case of water fillings, counterweights with total masses comprised in the range of 100 to 700 kg are foreseen. The main difference between the two options lies in the ease of transport, since in the case of water-filled bases, these can be transported empty, with less weight, to be filled once installed. On the other hand, concrete-filled bases may be more suitable for counterweighting larger, more heavily loaded structures.

[0012] In a final preferred example, the counterweight measures 1.20 x 1.00 metres, providing a total weight of 1000 kg.

[0013] The upper face of the base has a number of anchorage points, distributed over its entire surface and sized according to the following standard truss measurements, in centimetres:

- truss with square base: 11x11; 20x20; 29x29; 40x40; 52x52; 76x76; 1,05x0,62;
- truss with triangular base: 22x19.4; 29x26; 40x35.3, to be fitted with a piece called a half cone.

[0014] As already indicated, the upper face of the base has anchorage points to fit the part known as the adjustable base or spindle, used to anchor the Layher® type part with a self-tapping and hydraulic system.

[0015] The adjustable legs of the counterweight extend from the vicinity of the respective corners of the lower face of the base to support it on the ground. They include

an adjustment mechanism, independent for each leg, which allows to modify the height of each of the legs to allow an optimal arrangement on uneven or sloping terrain.

[0016] The supports for the handholds are located near the respective corners of the upper face of the base. They preferably consist of lugs welded to the base for connection with a hook or similar, so that the counterweight can be gripped and transported.

[0017] It is also possible to incorporate additional elements to the counterweight, such as, for example, its own LED lighting or an installation for using solar energy by means of photovoltaic panels, which allows the LED lighting to operate autonomously without the need for connection to an external source.

[0018] Likewise, the side faces of the base can have interchangeable plates for use as an advertising surface or for the insertion of any type of message.

[0019] Lastly, the base of the counterweight can be fitted with a housing for attaching an umbrella pole.

[0020] The counterweight thus described is a simple and economical solution, which overcomes the above-mentioned problems in an advantageous manner.

DESCRIPTION OF THE DRAWINGS

[0021] In order to complement the description being made and in order to assist in a better understanding of the characteristics of the invention, in accordance with a preferred example of a practical embodiment of the same, a set of drawings is attached as an integral part of the said description, in which the following is illustratively and non-limitingly depicted:

Figure 1.- Shows a perspective view of the counterweight element.

Figure 2.- Shows a perspective view of the counterweight element in use, coupled to the base of a temporary structure.

Figure 3.- Shows a top plan view of the counterweight element.

Figure 4.- Shows a lower plan view of the counterweight element.

Figure 5.- Shows a side view of a cross section of the counterweight.

Figure 6.- Shows a plan view of an assembly made with several counterweights linked to each other and to a temporary structure.

PREFERRED EMBODIMENT OF THE INVENTION

[0022] A detailed explanation of an example of a preferred embodiment of the object of the present invention

is given below with the aid of the figures referred to above.

[0023] The counterweight element for assembly of temporary structures described herein, shown in figures 1 and 2, is designed to contribute to the stabilisation and resistance to the dynamic and static loads to which a temporary structure (E) is subjected during use.

[0024] For this purpose, the counterweight element basically comprises a base (1), equipped with anchorage points (2) for coupling with the temporary structure (E), adjustable legs (3) to ensure correct support of the base (1) on the ground, and supports (4) for gripping and transporting the base (1).

[0025] The base (1) has a prismatic geometry and is formed by the union of several plates that form side faces (5), an upper face (6) and a lower face (7). The respective inner sides of the faces (5,6,7) delimit an inner core (8), which can be filled with a filling element designed to add weight to the base (1), such as water or concrete.

[0026] In the embodiment shown in the attached figures, the base (1) is shaped like a rectangular prism and the inner core (8) is filled with a volume of water. The plates forming the faces (5,6,7) are made of iron.

[0027] The upper face (6) of the base (1) has the aforementioned anchorage points (2), evenly and equidistantly distributed over its entire surface. The anchorage points (2) are dimensioned and configured for coupling with structural elements of temporary structures (E) of both truss and Layher® types.

[0028] The base (1) also has a through housing (9) that extends from the upper face (6) to the lower face (7) through the inner core (8). In this embodiment, the through housing (9) is arranged in a central position, and is designed to house elements such as the pole of a parasol, a lantern or lighting element, etc.

[0029] The adjustable legs (3) extend from the respective vertices of the lower face (7) of the base (1), and each of them is equipped with means that allow the adjustment of its height with respect to said lower face (7). As can be seen in figure 5, in this preferred embodiment, the height adjustment is carried out by means of a threaded rod (10) that extends from the leg (3) towards the inside of the base (1) and moves inside an adjustment channel (11) defined in the inner core (8) of the base (1). The legs (3) also allow the consecutive stacking of several counterweight elements.

[0030] The supports (4) are arranged on the perimeter edge of the upper face (6) of the base (1), more specifically in the vicinity of each of the corners. In this version, they are made up of respective lugs that allow the counterweight to be gripped.

[0031] Figure 6 shows the plan view of an assembly made with several counterweights linked to each other and to a temporary structure (E).

Claims

1. Counterweight element for assembly of temporary

structures, for stabilisation and resistance to dynamic and static loads of a temporary structure (E), **characterised in that** it comprises:

prismatic geometry.

- a prismatic base (1), comprising: 5
 - side faces (5), an upper face (6) and a lower face (7);
 - an inner core (8) delimited by the inner sides of the faces (5,6,7), for housing a filling element; 10
 - anchorage points (2), defined on the upper face (6) of the base (1), for coupling with the temporary structure (E); 15
 - legs (3), adjustable in height, extending from the lower face (7) of the base (1); and
 - supports (4) for gripping and transporting the base (1). 20
- 2. Counterweight element according to claim 1, wherein the anchorage points (2) are dimensioned and configured for coupling with structural elements of temporary structures (E) of both truss and Layher® type. 25
- 3. Counterweight element according to any of the preceding claims wherein the base (1) comprises a through housing (9) extending from the upper face (6) to the lower face (7) through the inner core (8). 30
- 4. Counterweight element according to any of the preceding claims wherein the supports (4) are located in the vicinity of the vertices of the upper face (6) of the base (1). 35
- 5. Counterweight element according to any of the preceding claims wherein the supports (4) are lugs.
- 6. Counterweight element according to any one of the preceding claims wherein the filling element is concrete. 40
- 7. Counterweight element according to any one of claims 1-5 wherein the filling element is water. 45
- 8. Counterweight element according to any of the preceding claims wherein the base (1) is made of iron.
- 9. Counterweight element according to any of the preceding claims wherein the height adjustment of the legs (3) is made by means of a threaded rod (10) extending from the leg (3) into the base (1) and moving inside an adjustment channel (11) defined in the inner core (8) of the base (1). 50 55
- 10. Counterweight element according to any of the preceding claims wherein the base (1) has a rectangular

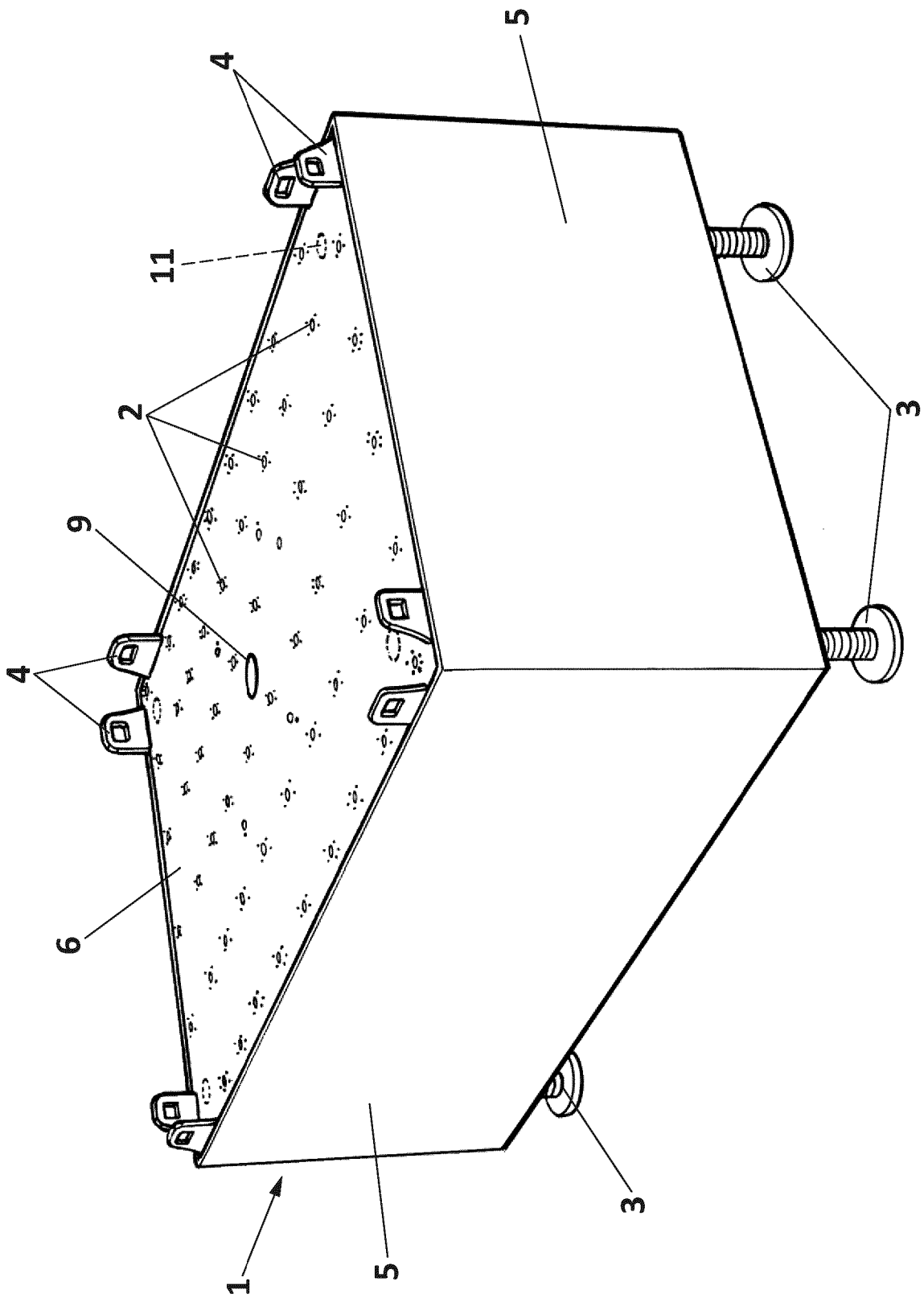
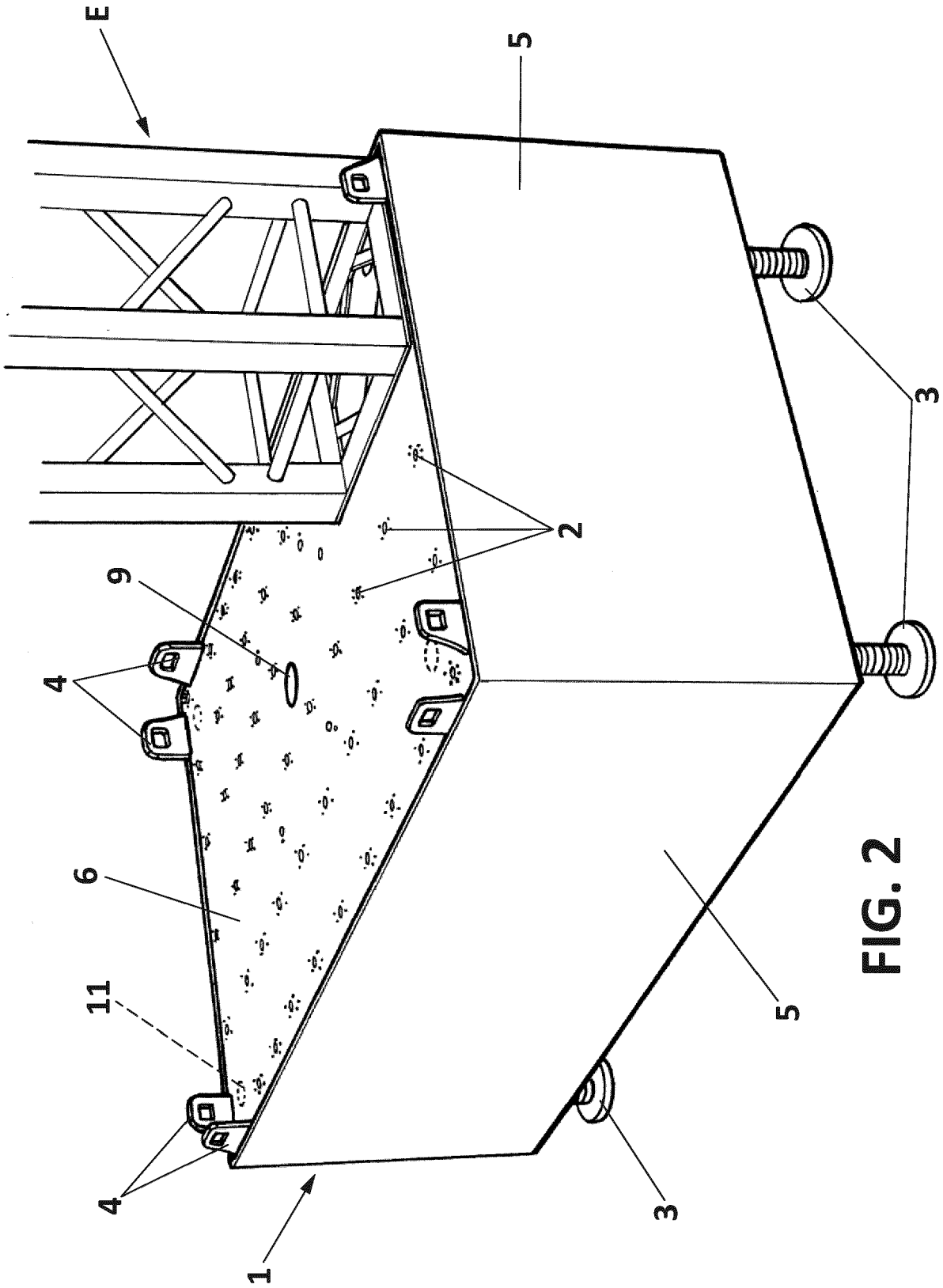


FIG. 1



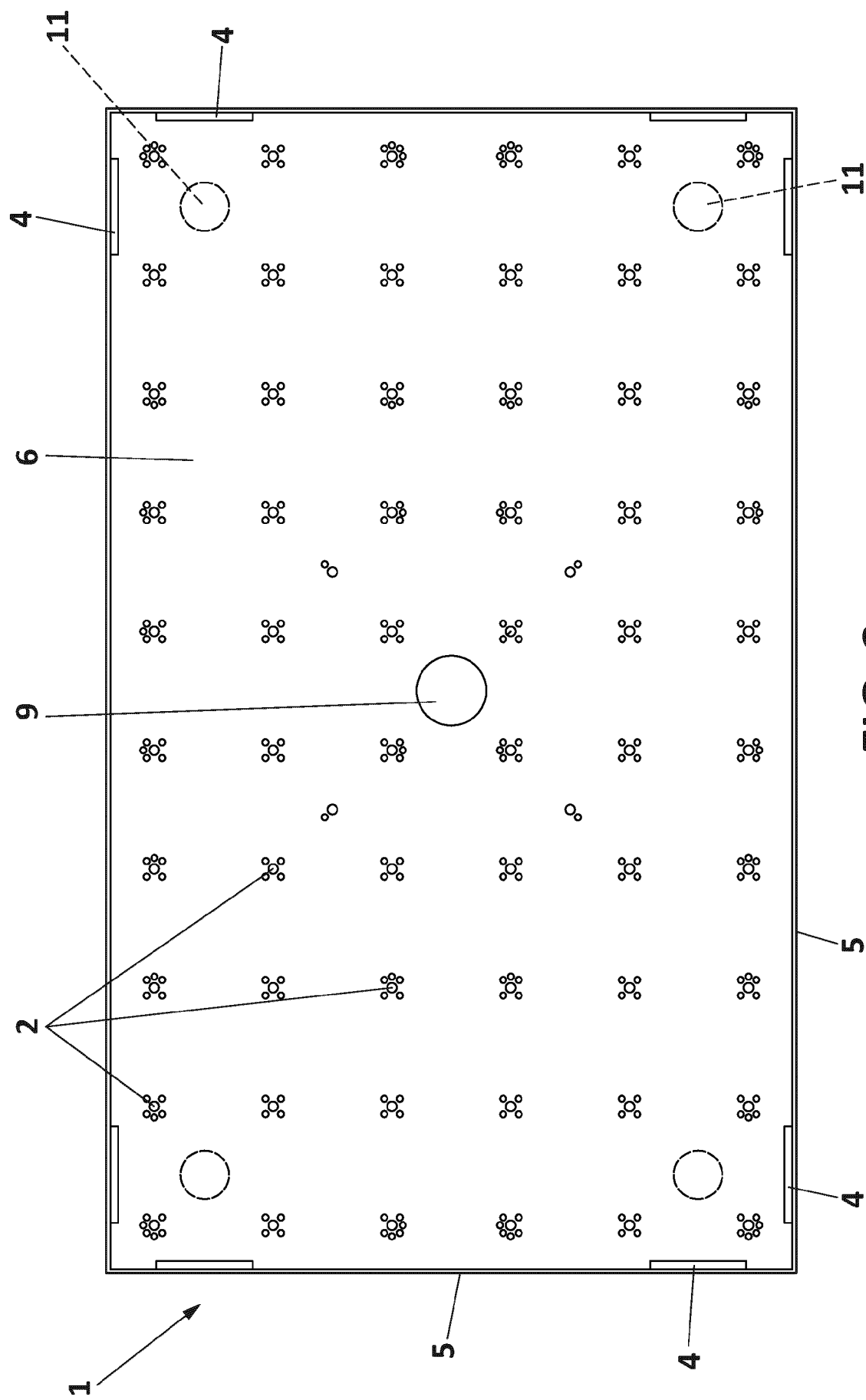


FIG. 3

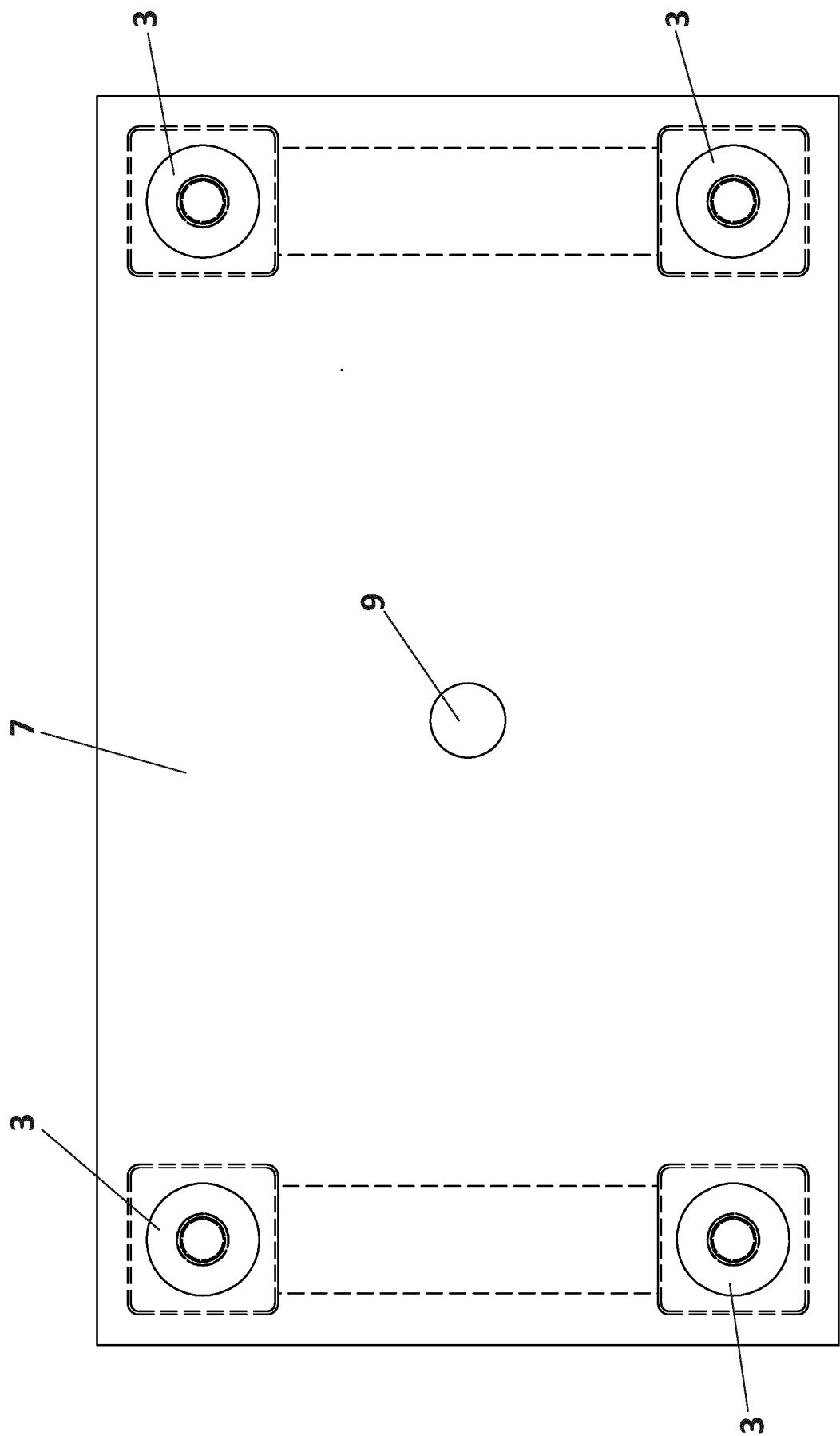


FIG. 4

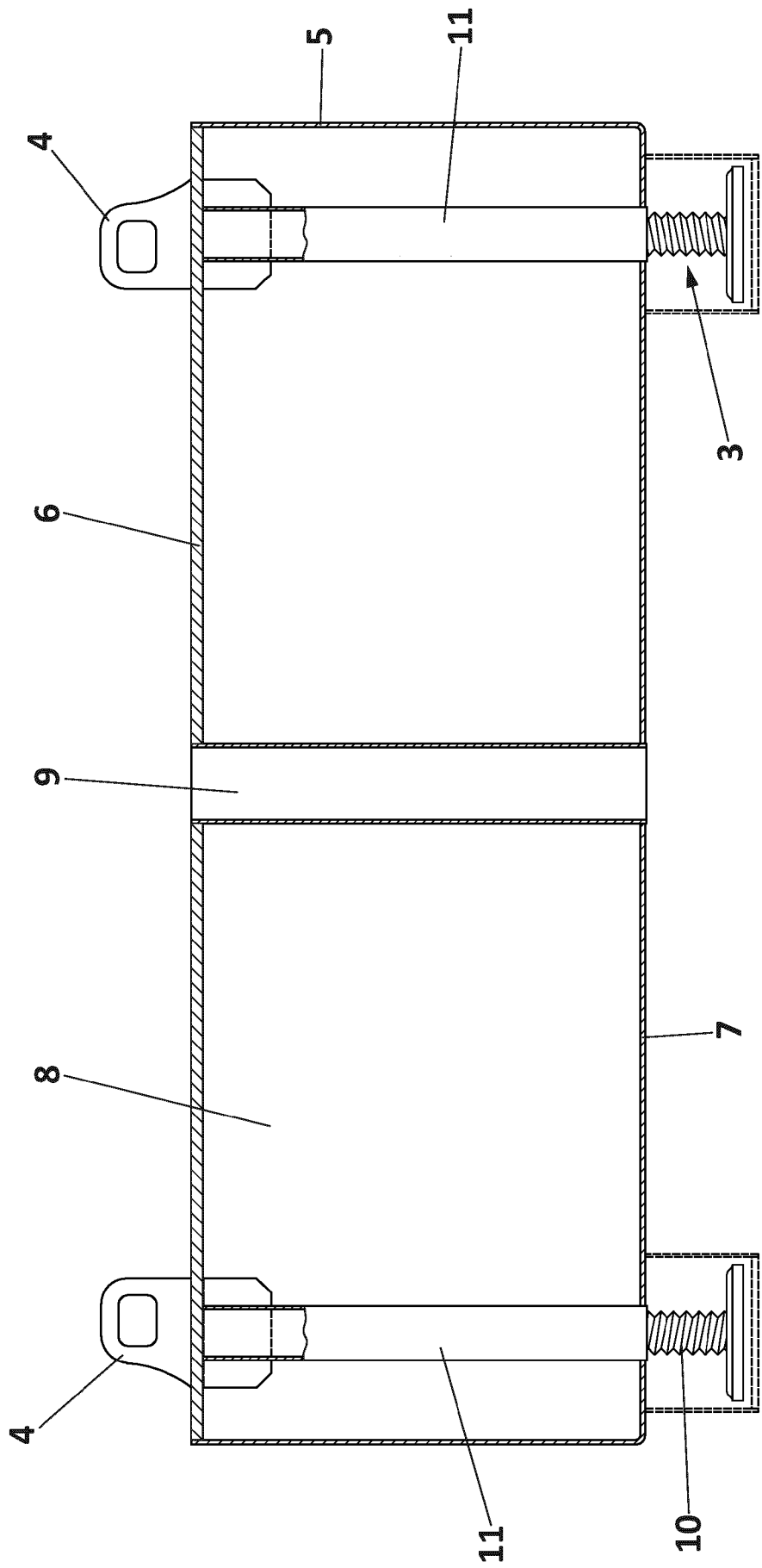


FIG. 5

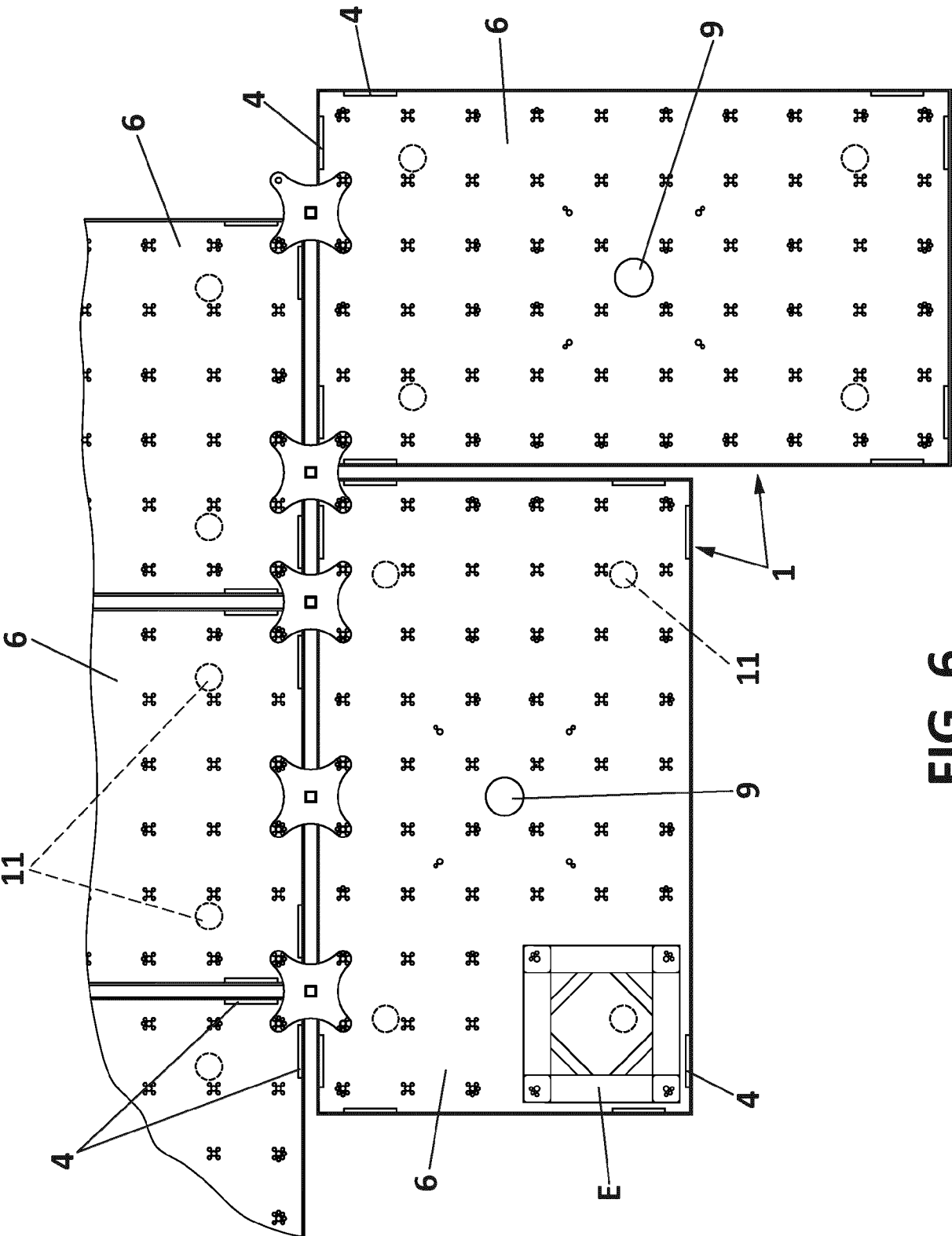


FIG. 6



EUROPEAN SEARCH REPORT

Application Number

EP 25 38 2678

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (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 4 December 2025	Examiner Stefanescu, Radu
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.

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