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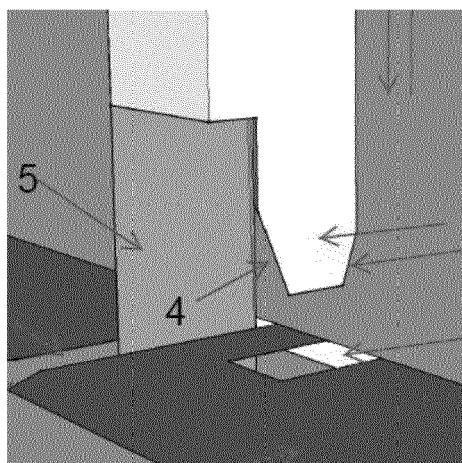
(54) **LOCK SYSTEM FOR SHELF**

(57) The present invention discloses a method to lock a multiplum of shelf(s) (24) to a back plate (26).

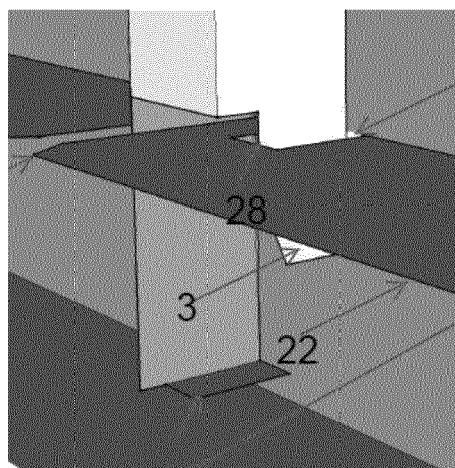
Multiplum of shelf(s) (24) is inserted through cut line(s) (25) into back plate (26), where locking profile (13) with locking bar (3) can lock the shelf(s) (24) to the back plate (26). Locking profile (13) is moved to open position for insert of shelf(s) (24) and hereafter the locking profile (13) is moved into locked position. In locked position of locking profile (13) the shelf(s) (24) are locked firmly to the back plate (26).

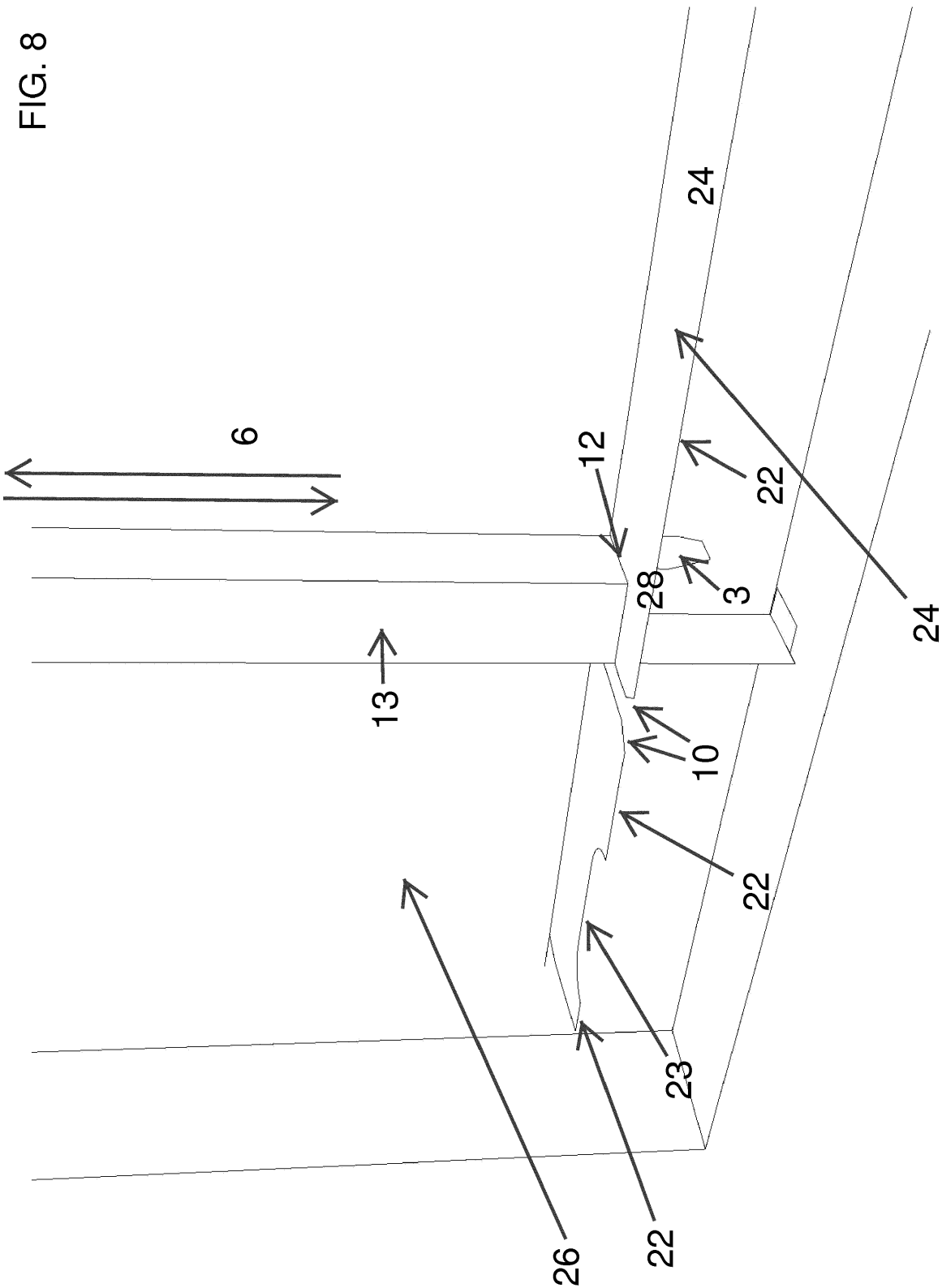
Locking profile (13) can be positioned vertical (as in illustration below) or vertically. Shelf can have lock hole(s) (12) in horizontal or vertical orientation to match locking profile (13). Locking profile (13) has handle (7) at one end to operate locking profile (13) to open (un-locked) and into closed position (locked).

Open position:



Closed position:





Description

FIELD OF THE DISCLOSURE:

[0001] The present invention is a lock system to be used with removable shelf(s) or equivalent part with requirement of fixation to a back plate. The locking system can have 1 or more locks for multiple shelves to be locked to a back plate in same movement. A shelf system with removable shelf(s) that can be assembled, disassembled and altered without the usage of tooling.

BACKGROUND OF THE DISCLOSURE:

[0002] The locking setup can be used in any situation for a great variety of reasons, to lock a shelf or equivalent part to a back plate. The flexibility by having a locking setup with or without usage of tooling, makes it very flexible and easy to add or remove shelf's (13) to back plate (26) and hereby making it very simple for the user to adjust the shelf position quickly and easy or remove or exchange a given shelf.

BRIEF DESCRIPTION OF THE DRAWINGS:

[0003]

FIG. 1 Locking profile (13) in close up view of lock pal (3) and surrounding area on Locking profile (13).
 FIG. 2 Locking profile (13) in 5 lock design, one of many quantity lock design versions of a locking profile (13).
 FIG. 3 Shelf (24) in close up view of one of multiple locking area's on a shelf for this lock system invention.
 FIG. 4 Shelf (24) in 2 lock variant, one of many quantity lock variant versions of a shelf for this lock system invention.
 FIG. 5 Front view of shelf (24) assembled to back plate (26).
 FIG. 6 Back view of shelf (24) assembled to back plate (26), before locking profile (13) is attached to the back plate.
 FIG. 7 Back view of shelf (24) assembled to back plate (26) with locking profile (13), open position.
 FIG. 8 Back view of shelf (24) assembled to back plate (26) with locking profile (13), locked position.
 FIG. 9 Back plate (26), front view.
 FIG. 10 Back plate (26), back view.
 FIG. 11 Back plate (26) and shelves (24) with locking profile (13) in locked position, seen from the back

[0004] While the method and device described herein are susceptible to various modifications and alternative constructions, certain illustrative embodiments thereof has been shown in the drawings and will be described below in detail.

[0005] It should be understood, however, that there is

no intention to limit the invention to the specific forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention and the appended claims.

DETAILED DESCRIPTION

[0006] Referring now to the drawings, and with specific reference to FIGS, we will in the following describe in detail all elements in the invention.

[0007] New invention is characterized by usage of locking profile(s) (13) behind the back plate (26), where the locking profile (13) lock the shelf(s) (24) to back plate (26), when the locking profile (13) is moved to locked position. Each shelf has locking hole(s) (12) where locking pal (3) on locking profile (13) is locking the shelf into hole (12) on shelf (24) in locked position. Unlocking of shelf(s) (24) is done by moving the locking profile (13) locking pal (3) out of the hole (12) in the shelf (24) to unlocked position. See fig. 7/8 for illustration of open and closed position of locking profile (13).

[0008] Each assembled shelf system consist of one back plate (26), 1 or more shelf(s) (24), 1 or more locking profile(s) (13). Beside the described 3 parts and there interaction, as described in FIG. 1-11, there are additional parts in a total shelf system, but all these additional parts are non-relevant to the core of the lock system, consisting of locking profile (13), a back plate (26) and a shelf(s) (24). Additional parts are not specified, as outside the field of disclosure for a new locking system and this patent application.

[0009] The Locking profile (13), back plate (26) and the shelf's (24) may be fabricated from metal or other strong materials, for durable and sturdy material with required strength, such as steel, aluminium, wood, etc.

[0010] The process or processes used to form the various components of the lock system, the locking profile (13), the back plate (26) and the shelf(s) (24) can also vary considerably as necessary to form each given component.

[0011] The lock system's components may be injection moulded, blow moulded, continuously molded, extruded, vacuum formed, rotation moulded, turned, CNC milled, laser cut, turret punched, punched or the like. The manufacturing process or processes may be selected based on feasibility, cost, tooling concerns, as well as other factors for a given application.

[0012] In this exemplary embodiment, FIG. 2 describes one example of a locking profile (13). The locking profile (13) may consist of a handle (7) in one end, handle (7) design can vary, dependent on requirements. A number of locking pal's (3) along the locking profile (13), an opening (5) around each locking pal (3) to secure the receipt of the shelf(s) (24) for assembly and locking. And at one end, at the opening (5), this may also be used for controlling of the movement of the locking profile (13), when moved up for open (un-locked) and moved back in locked

position. And one end may also have a blocking setup, so the locking profile (13) can not open more than specified to secure required functionality of the locking system. The locking profile (13) has a generally square shape, but could be any other shape such as round, oval, or odd shaped, as long as the shape of the Locking profile (13) can intersect the shelf(s) (24) and hereby lock the shelf(s) (24) to the back plate (26).

[0013] The area around the locking pal (3) consist of a locking pal (3), two angled corners (2+4), an edge line (1) and an open area (5), which guide the shelf into position for locking. The locking profile (13) is then slighted up or down to unlock or lock the shelf(s) (24) in position, as illustrated in FIG. 1 (6) and FIG. 2 (6).

[0014] The shelf (24) is described on FIG. 3 and 4, and the shelf can vary in thickness, width (20), depth (21) and corners (19) can vary in R-value. The shelf can be rectangular, round or odd shaped. Shelf may have angled lines to align the shelf(s) (24) in the back plate (26) cut line (25). The part of the shelf (24), that is going inside the back plate (26), may consist of a line of details, which may include a left and/or right stop line (16) in the shelf (24), may include an angled line (15) at left and/or right side, may include a cut area (23), may include a line (22) to control the depth of the shelf(s) (24) in the back plate (26) for locking of the shelf(s) (24) by the locking profile(s) (13), may include angled lines (10) to make the insert of the shelf(s) (24) easier, may include a cut line (11) to align the locking profile(s) (13) in the correct position, so the locking pal(s) (3) can slight in the locking hole (12), for locking the shelf (24) to the back plate (26). Locking hole (12) may be square, round, oval or odd shaped, dependent on variant of the Locking profile (13).

[0015] FIG. 3 illustrates the movement (18) of the shelf for insert into the back plate (26) or removal from the back plate (26).

[0016] FIG. 5 illustrates an example of a shelf (24) inserted in the back plate (26), through the cut line (25). The insert movement and removal movement of the shelf (24) is illustrated by the two arrows (27).

[0017] FIG. 6 illustrates the back side of the back plate (26), after the shelf (24) has been inserted into the cut line (25) and before the Locking profile (13) is positioned onto the back plate (26).

[0018] FIG. 7 illustrates the back plate (26), with the inserted shelf (24) and the Locking profile (13) in open position. The two arrows (6) show the movement of the Locking profile (13) for open (unlocked) and closed (locked) position. In FIG. 7 the locking profile (13) is in open position (unlocked), so the shelf (24) can be inserted in the back plate (26), and then locked afterwards.

[0019] FIG. 8 illustrates the back plate (26), with the inserted shelf (24) and the locking profile (13) in closed (locked) position. The locking profile (13) use the locking pal (3) to lock the shelf (24) to the back plate (26), by locking the edge of the hole (12) against the line (28) of the locking pal (3). The Locking pal (3) can slight free into the locking hole (12) due to the angled lines of the

locking pal (3), where the angled lines (2+4) makes the locking profile (13) movement guided to prevent friction between the locking profile (13) and the shelf(s) (24) into closed (locked) position or reversed.

[0020] FIG. 9 illustrates an example of the back plate (26) in front view, where a multiplum of cut lines (25) is visible. The cut line (25) can vary in width and height and/or consist of a multiplum of cut lines (25) in vertical level and a multiplum of cut lines (25) in horizontal direction.

[0021] FIG. 10 illustrates an example of the back plate (26), viewed from the back side of the back plate (26), before the shelf (24) and locking profile (13) is assembled to the back plate (26). Back plate (26) and example of cut lines (25) in the back plate (26).

[0022] The construction and arrangement of the elements of the back plate (26), the shelf (24) and the locking profile (13) and the method as shown herein are only illustrative, and may vary greatly from the disclosed embodiments. Although only one embodiment of the locking system, consisting of a back plate (26), a multiplum of shelf's (24) and a multiplum of locking profiles (13) has been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible (e.g. variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, etc.) without materially departing from the present invention.

[0023] For example, elements shown as integrally formed may be constructed of multiple parts or elements. Similarly, the operation of the interfaces may be reversed or otherwise varied, the length or width of the structures and/or members or connector or other elements of the system may be varied, and/or the nature or number of adjustment positions provided between the elements may be varied. Also, the removable shelf (24) can have any number of a variety of designs and configurations to work with the variety of the back plate (26) and the locking profile (13). The back plate (26) can have any number of a variety of designs and configurations to work with the variety of the shelf (24) and the locking profile (13). The locking profile (13) can have any number of a variety of designs and configurations to work with the variety of the back plate (26) and the shelf (24). Further, the removable shelf (24), the back plate (26) and the locking profile (13) can also include one or more structural supports to increase functionality and/or strength.

[0024] The elements and/or assemblies of the system may be constructed from any of a wide variety of materials that provide sufficient strength or durability, in any of a wide variety of colors, textures and combinations. Accordingly, the foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom, as modifications will be apparent to those skilled in the art.

Patent claims - patent of lock system for removable shelf to back plate:

[0025] The present invention is a lock system to be used with removable shelf(s) or equivalent part with requirement of fixation to a back plate. The locking system can have 1 or more locks for multiple shelves to be locked to a back plate in same movement. A shelf system with removable shelf(s) that can be assembled, disassembled and altered without the usage of tooling.

[0026] Known technic to make a back plate or wall with removable shelves is as described in patent WO 2015/034715 A1, which operates with clamp(s), fig. 2 (200/300), that are assembled to a back plate (wall) and shelf assembly is screw operated by usage of bolts, fig. 6(208a). This technic requires clamps (200/300) to initiate friction to the shelf and turning of bolts for assembly and removal of shelf(s) to/from back plate (wall), see fig 2/4/5 in patent WO 2015/034715 A1 and page 4, line 28- in patent WO 2015/034715 A1. Patent WO 2015/034715 A1, page 5, line 14- specify quantity and position of clamps used for locking shelf to back plate (wall).

[0027] New invention is characterized by;

Claims

1. New invention is **characterized by** usage of locking profile(s) (13) behind the back plate (26), where the locking profile (13) lock the shelf(s) (24) to back plate (26), when the locking profile (13) is moved to locked position. Each shelf has locking hole(s) (12) where locking bar (3) on locking profile (13) is locking the shelf in locked position. Unlocking of shelf(s) (24) is done by moving the locking profile (13) to unlocked position. See fig. 7/8 for illustration of open and closed position of locking profile (13).

The invention of the locking system to lock shelf(s) (24) to a back plate (26) do not use clamps and locking is done without turning of bolts to initiate friction between clamps and shelf, as in WO 2015/034715 A1.

2. With reference to above new invention (section 1, line 19), additional invention characterized with a shelf (24) that is aligned to the locking profile (13) by cut guide line (10) and/or cut line (11) to secure position of shelf(s) (24) in alignment of locking profile (13) and/or locking hole (12) in shelf (24).

3. With reference to above new invention (section 1, line 19), additional invention characterized with control of depth of shelf (24) in back plate (26) may be controlled by stop line (16) on shelf (24) and/or may be controlled by cut line (22) on back of shelf (24).

4. With reference to above new invention (section 1, line 19), additional invention characterized with in-

sert of removable shelf (24) may be aligned by line (15) in right/left position of the shelf (24).

5. With reference to above new invention (section 1, line 19), additional invention characterized with a locking pal (3) may be done with added line (4) and line (2) for easy locking movement into hole (12) in shelf (24).

6. With reference to above new invention (section 1, line 19), additional invention characterized with locking profile (13) may have handle in one end to operate the locking profile (13) into locked or unlocked position.

7. With reference to above new invention (section 1, line 19), additional invention characterized with locking profile (13) may have alignment line (9) to align locking profile (13) to the proper position behind the back plate (26) for easy insert of the shelf(s) (24).

8. With reference to above new invention (section 1, line 19), additional invention characterized with locking profile (13) may have stop bend (8) or similar to control the free movement of the locking profile (13).

9. With reference to above new invention (section 1, line 19), additional invention characterized with the locking bar (13) may have cut area (5) around locking pal (3) in varied size and shape.

FIG. 1

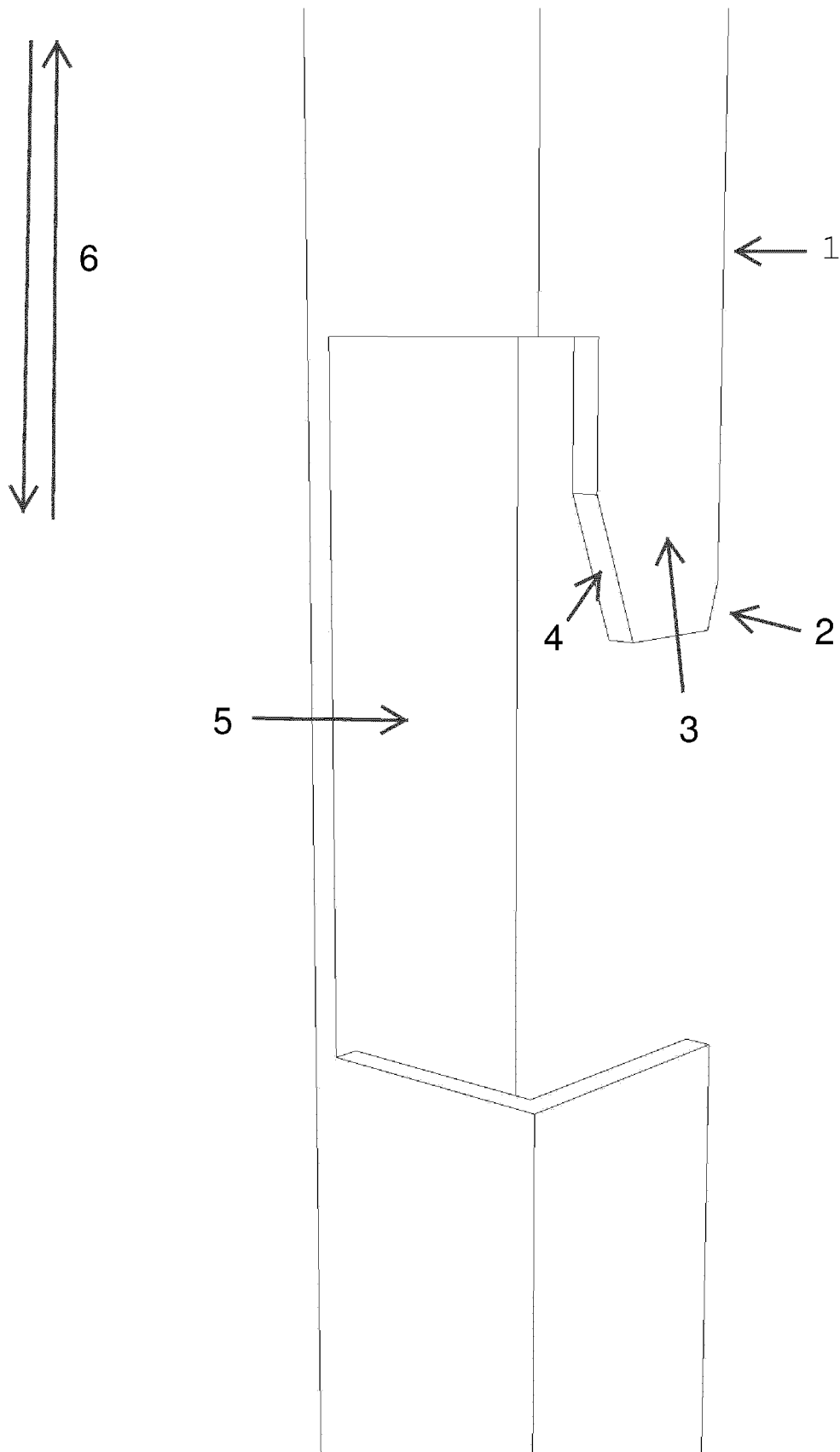


FIG. 2

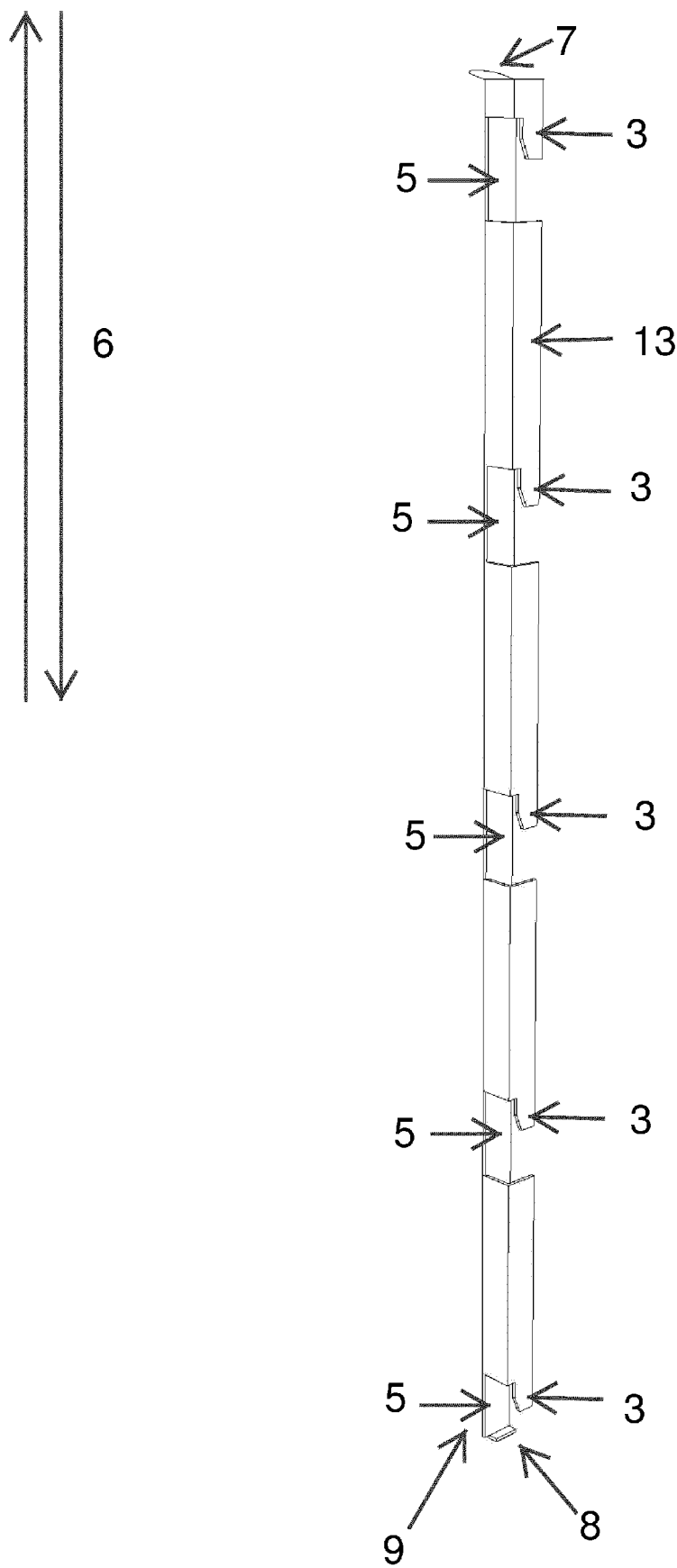


FIG. 3

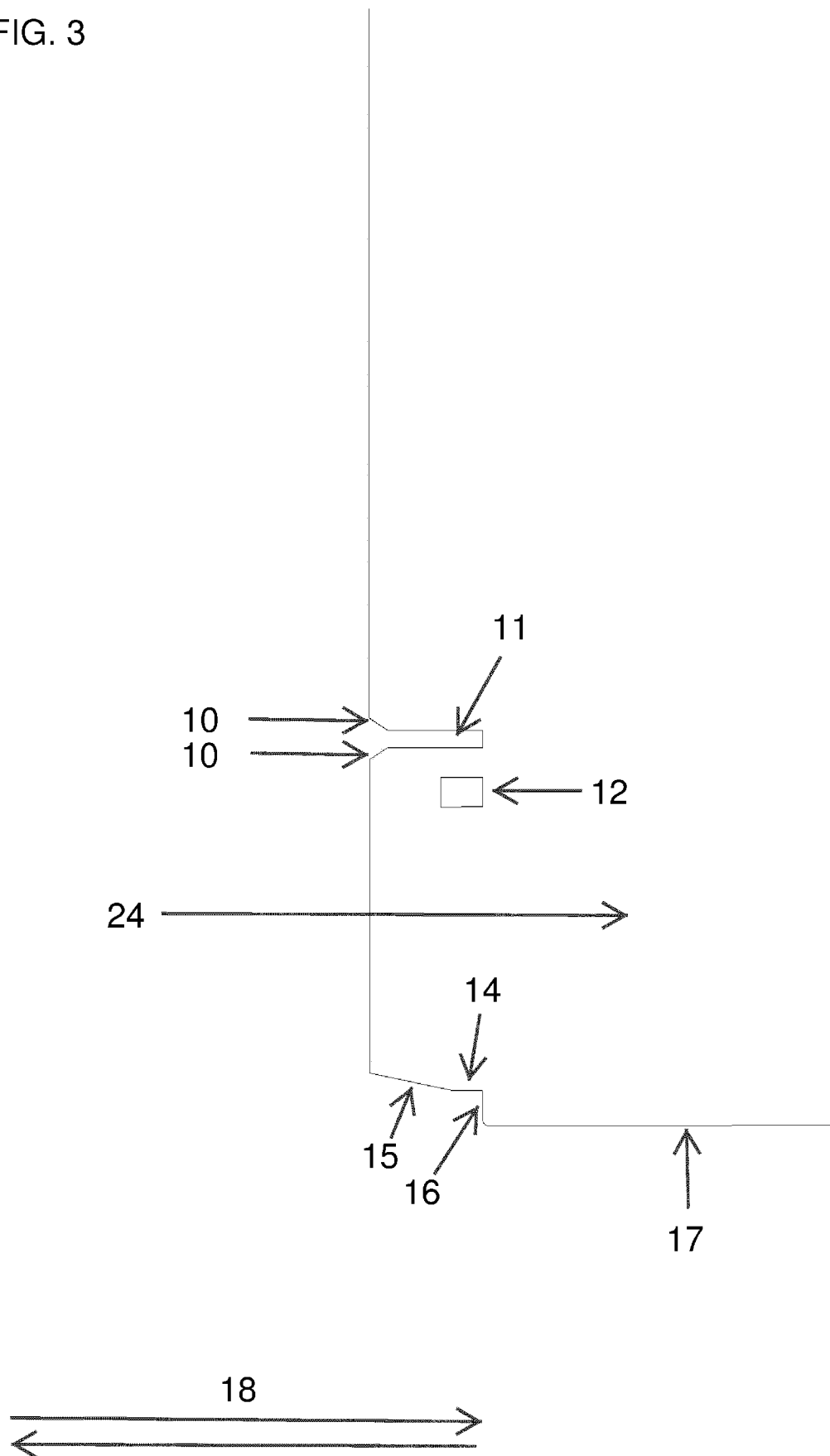


FIG. 4

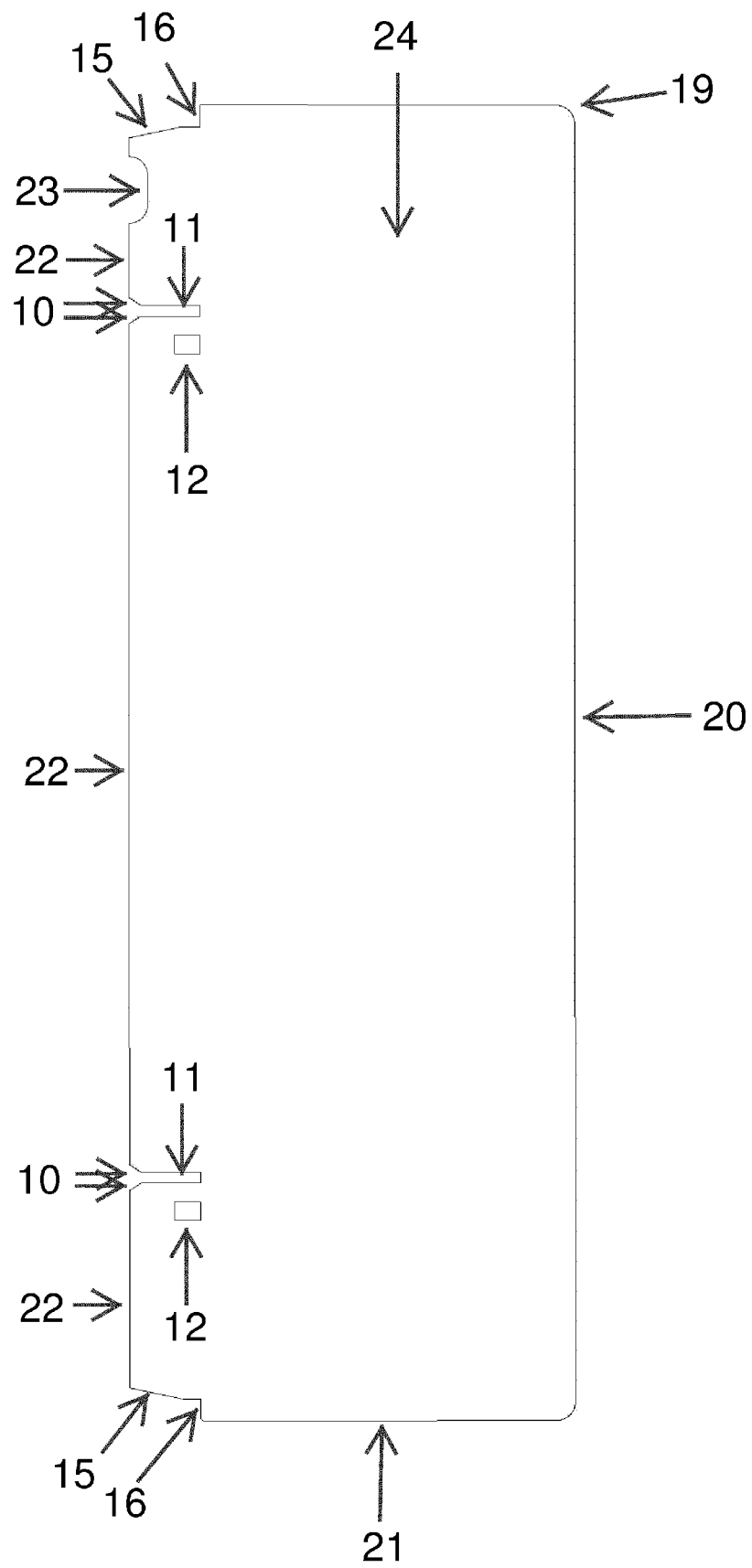


FIG. 5

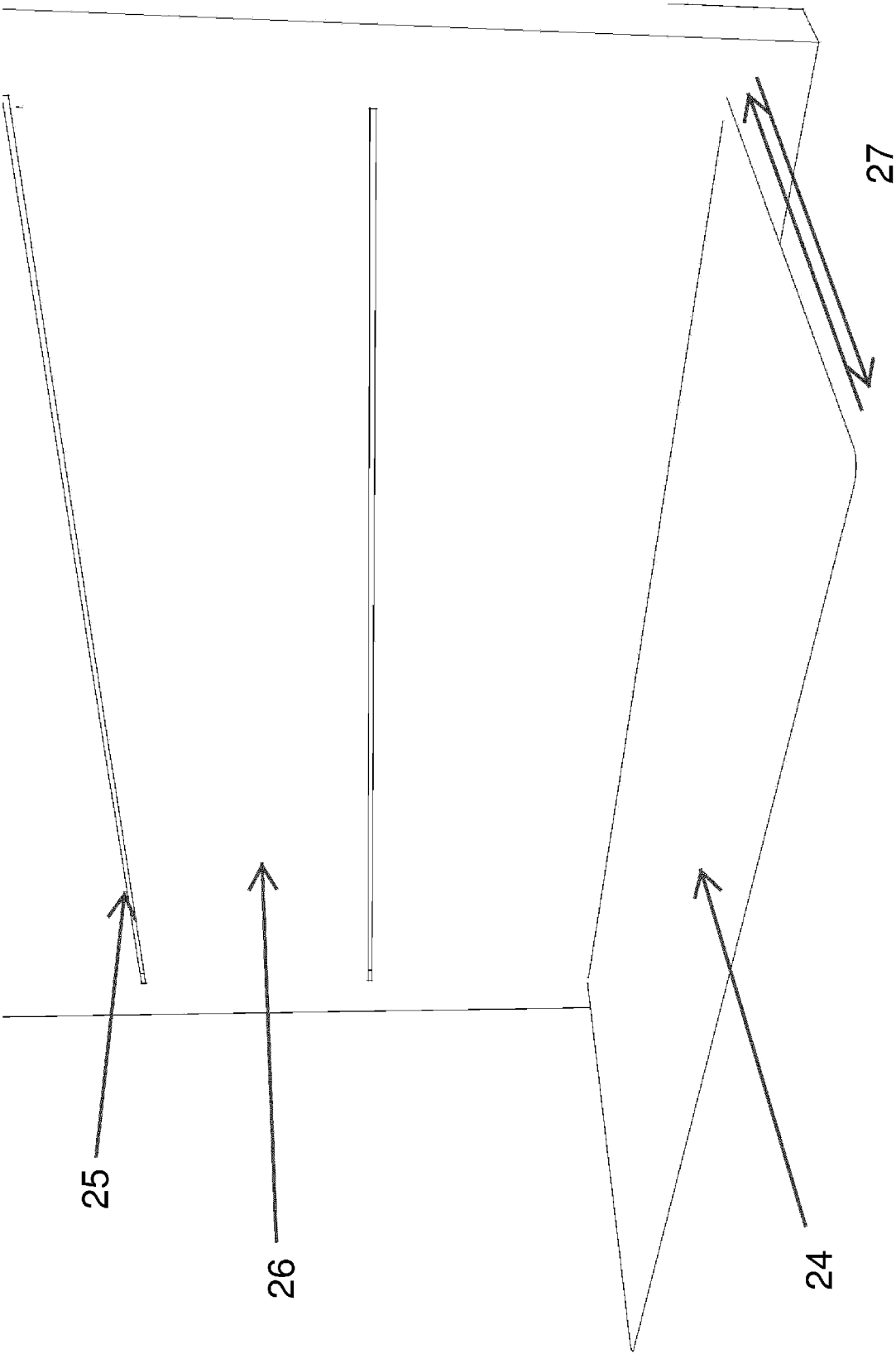


FIG. 6

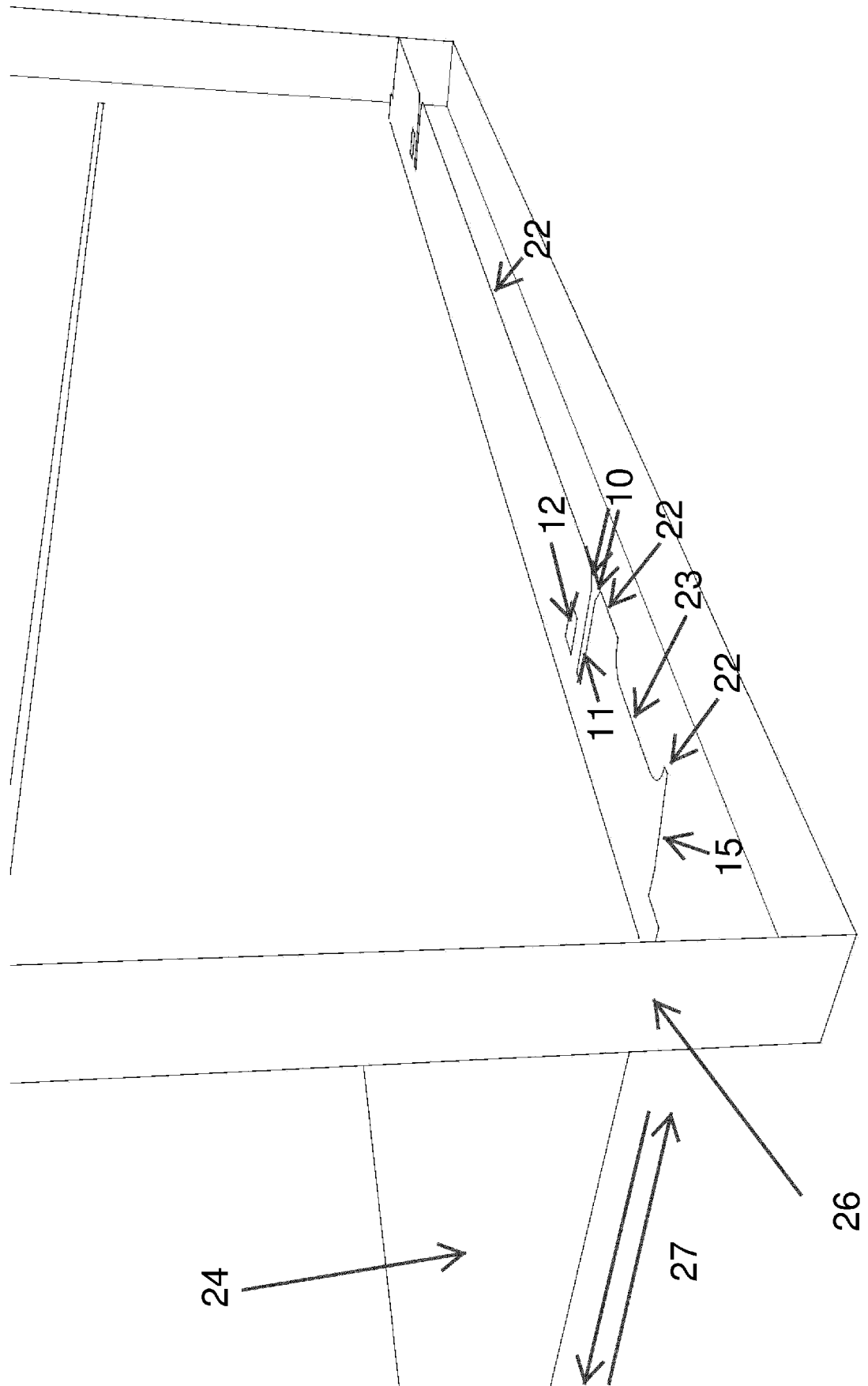
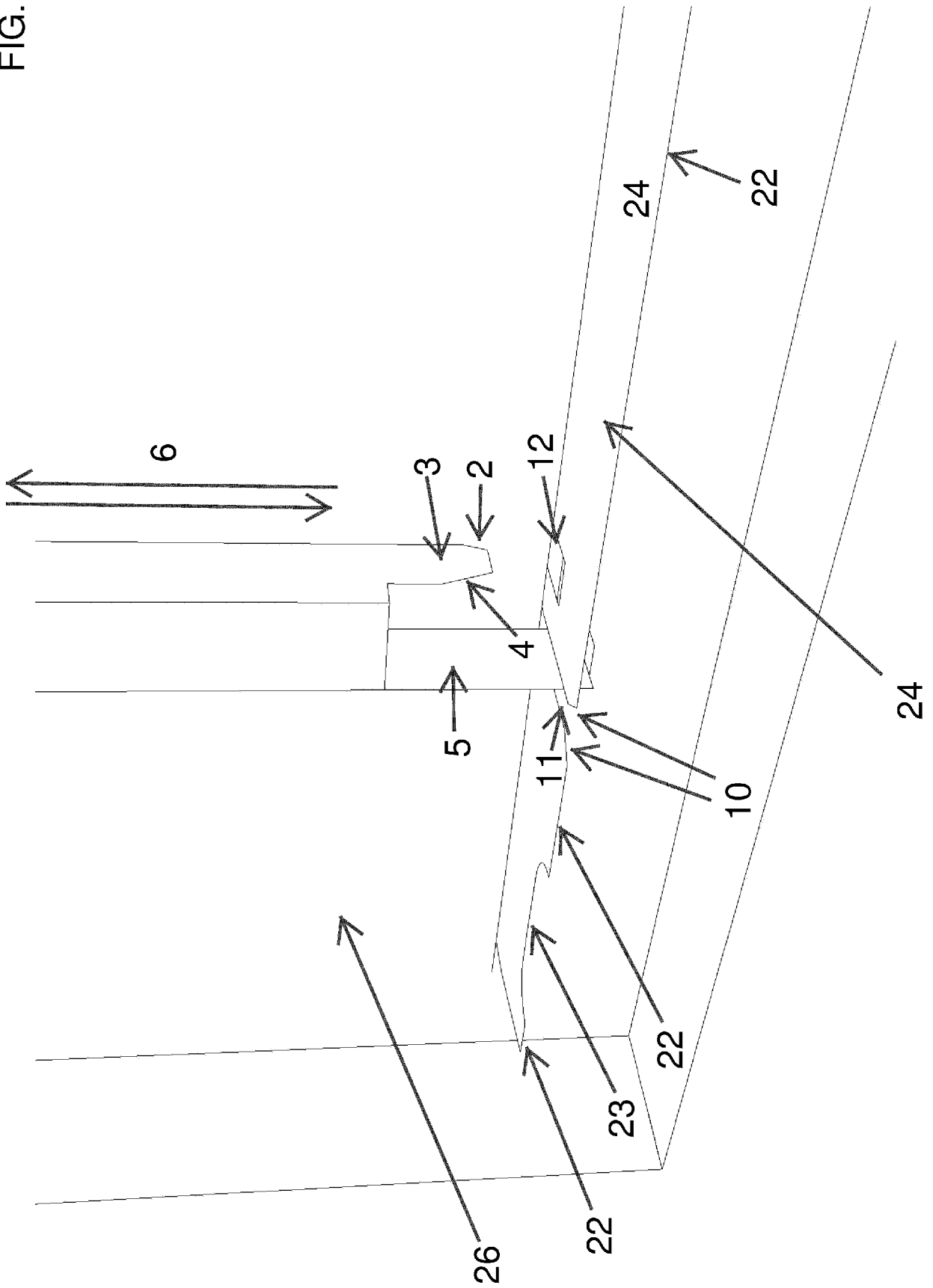


FIG. 7



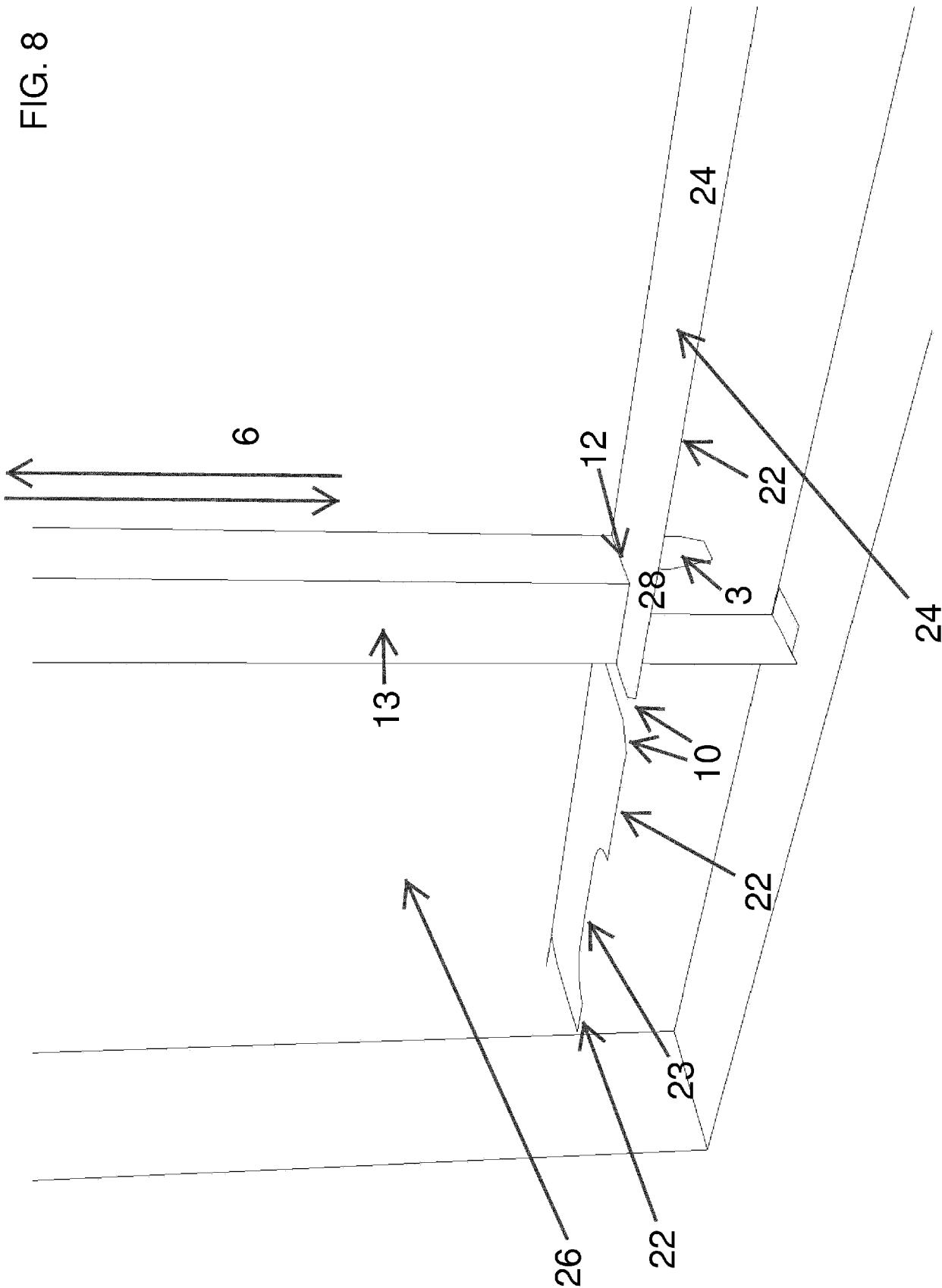


FIG. 9

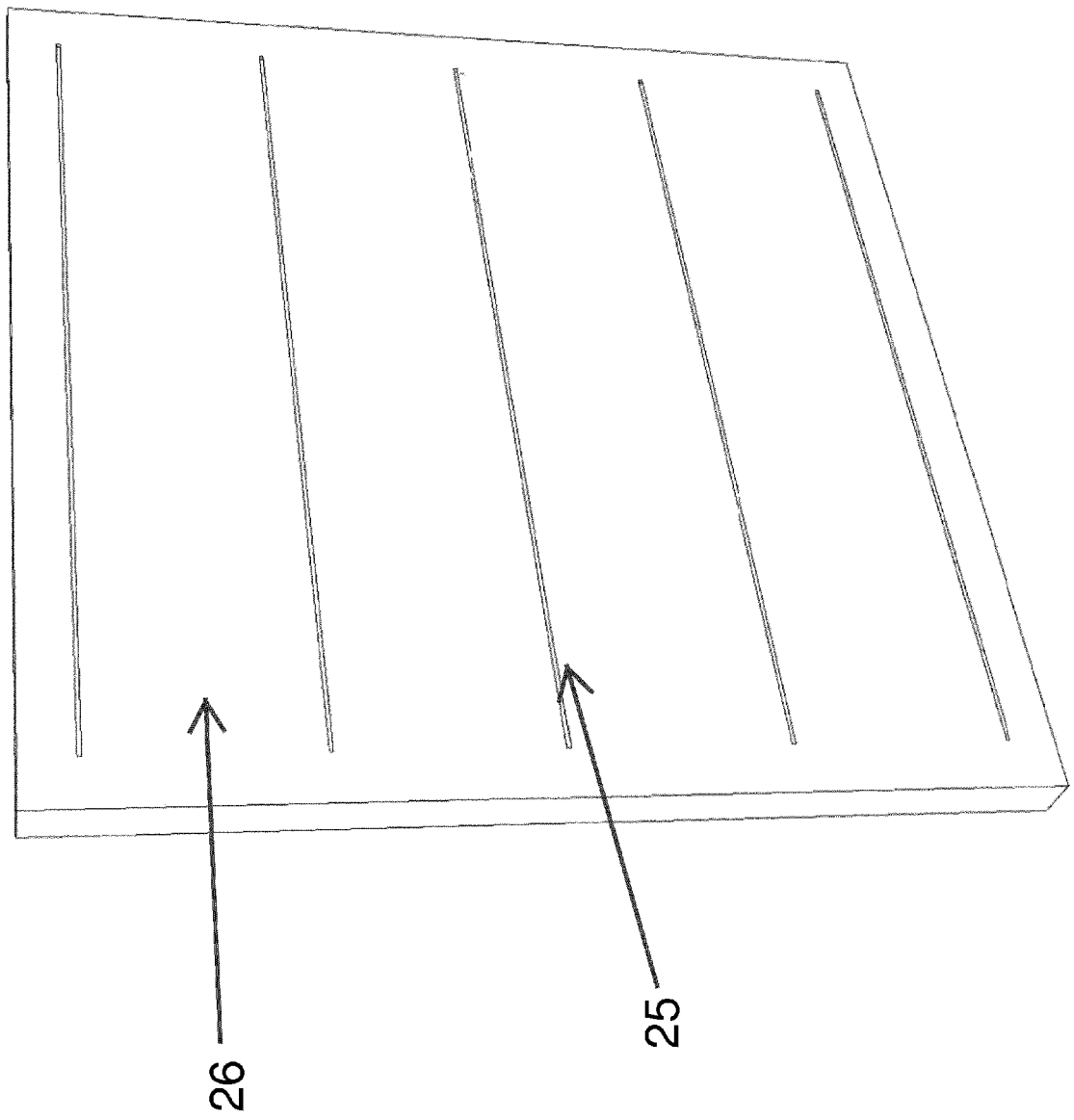


FIG. 10

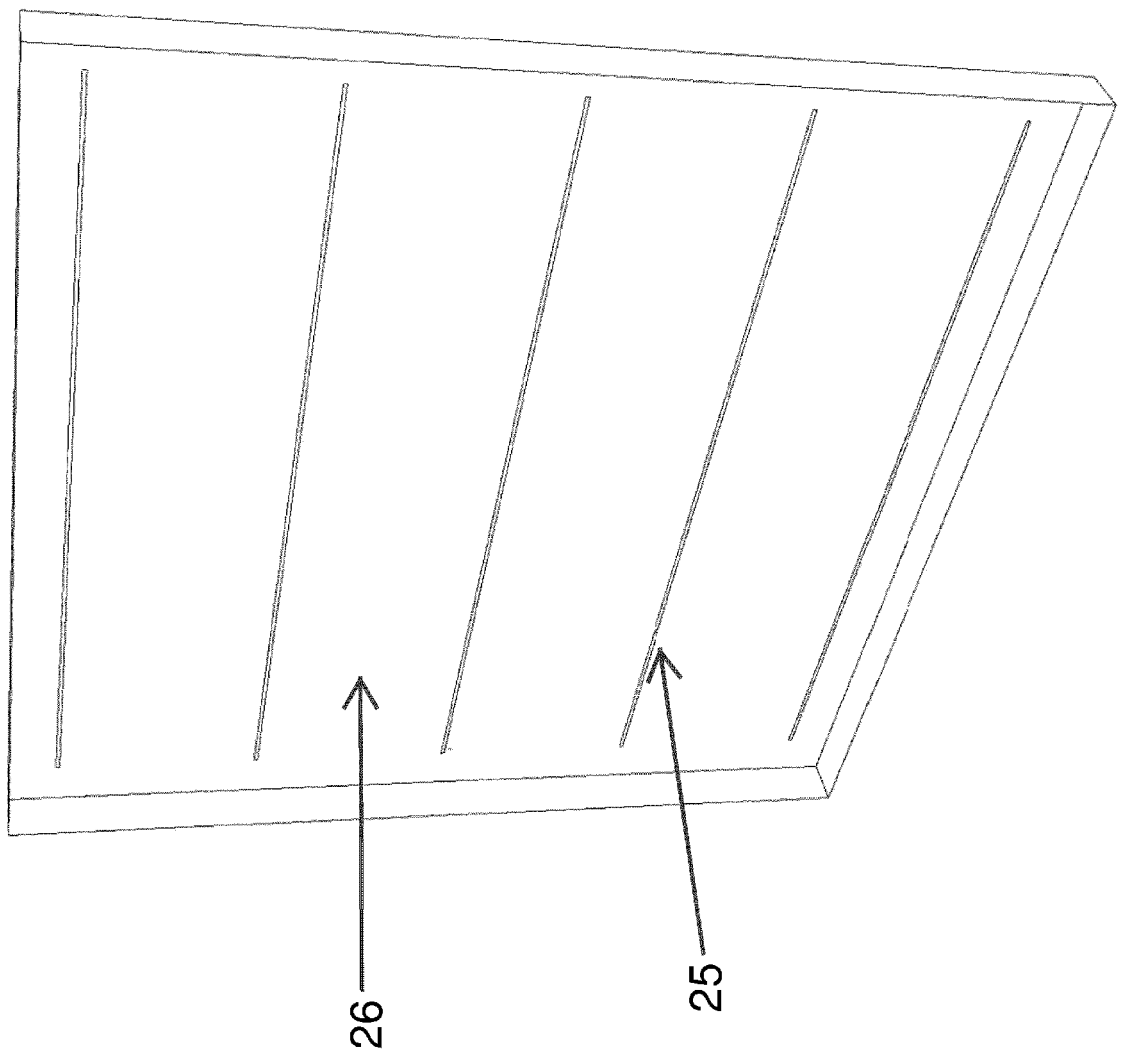
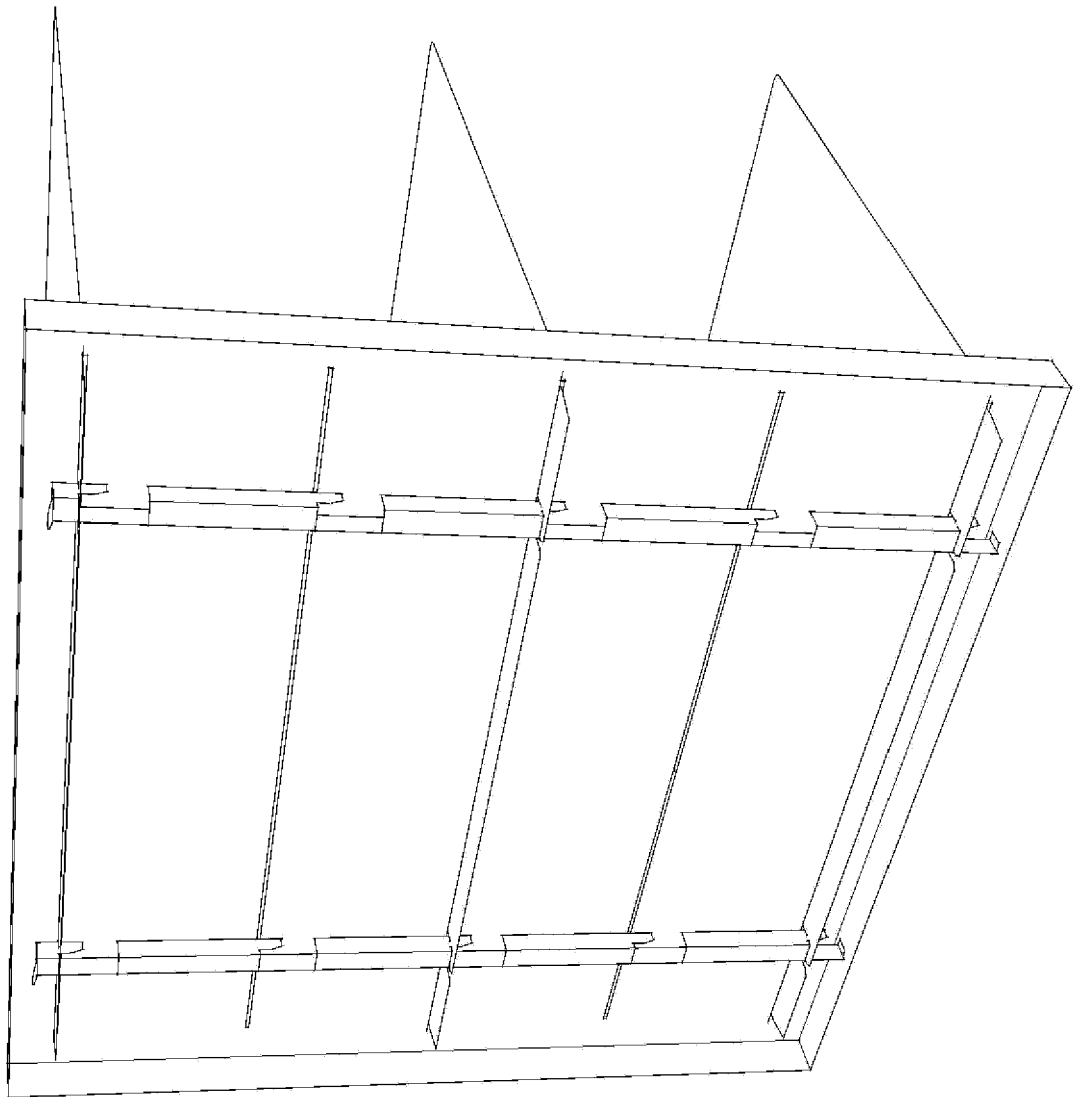


FIG. 11





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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		29 August 2018	Ibarrondo, Borja
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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

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