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(54) **Mounting assembly for a reservoir in particular a swimming pool and mounting process thereof**

(57) Assembly for mounting a reservoir in particular a swimming pool to the ground surface, or for wholly or partially burying thereof, consisting of beams (7, 8, 9, 10, 11, 12) stacked together, having an adaptively laying model (25) with markings of exact location for the attachment of pillars (1, 2), preferably of tubular section, with tabs at the top and bottom (22, 23), a profile (21) able to

simultaneously receive the anchoring profile (19, 20) for the waterproof and malleable pouch, a border (14, 15, 16, 17), end beam (9), mirrors (37) and a metal sheet (36).

This technology reduces the risk of inaccurate placement of the pillars during the mounting of the assembly, thus optimizing the levelling and vertical setting thereof, with a connection profile of the different elements of the assembly.

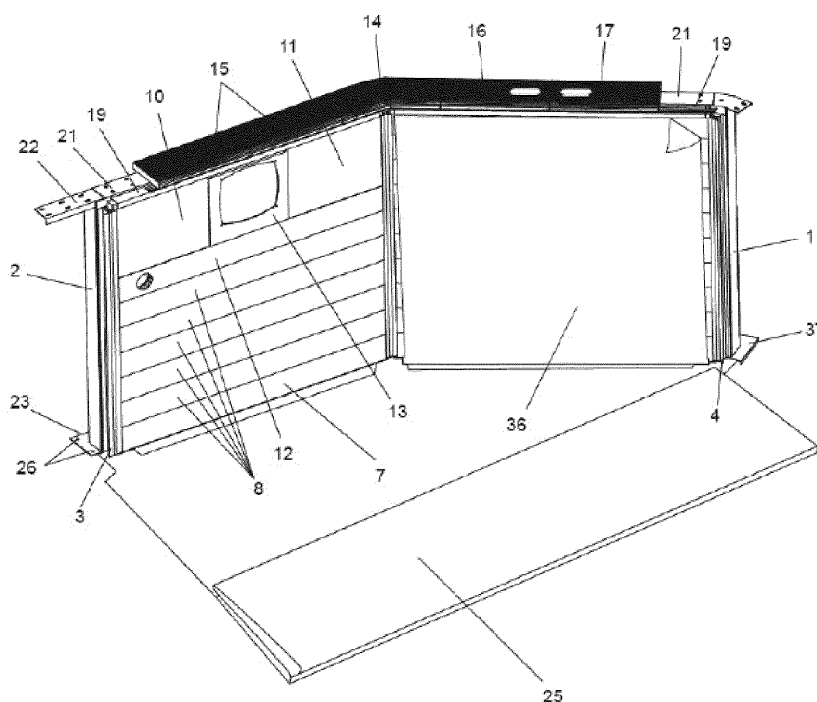


Figure 1

Description

Technical field

[0001] The present embodiment relates to a mounting assembly for a reservoir which may be a swimming pool by way of example.

Background art

[0002] Currently there are many systems for the construction of reservoirs using metal, wood and concrete. However, each building system has limitations arising from the characteristics of the materials used. Indeed, the use of wood involves rapid wear as well as high investment costs inherent to the maintenance of such system. With regard to metal and concrete, although being advantageous in terms of maintenance, sealing and stability, the main disadvantage is related to the aesthetics of the assembly which, given the intended end - use for bathing - and its implementation - gardens, terraces, among others - hardly merge with the surrounding environment.

[0003] PT 105317 presents a structure of prefabricated elements and fixtures, process for obtain and use thereof. The structure consisting of mortar elements and metal fixtures is an innovation compared to existing building systems. However, it does not present a simplified attachment of the pillars simultaneously with the inner impermeable and flexible coating of the reservoir.

[0004] In this sense, the present embodiment proposes overcoming the above difficulties and those associated with transportation, storage, resistance to shock, elongation and mounting of this type of structure.

Summary

[0005] The present application describes an assembly for mounting a reservoir to the ground surface, or for fully or partially burying thereof, consisting of metal guides (6), beams (7, 8, 9, 10, 11, 12) stacked together, comprising:

- a laying model (25) with markings of exact location for the attachment of pillars (1, 2);
- pillars (1, 2) with tabs on the top and bottom (22, 23);
- a profile (21) able to simultaneously receive the anchoring profile (19, 20) for the waterproof malleable pouch, the border (14, 15, 16, 17) and end beam (9);
- a mirror (37);
- a metal sheet (36).

[0006] In a preferred embodiment, the profile (21) included in the mounting assembly for a reservoir, has a U-shaped recessed section (24) for the laying of the anchoring profile (19, 20) by means of mechanical connection on the attachment points (26, 27).

[0007] In another preferred embodiment, the pillars (1,

2) included in the mounting assembly for a reservoir have arched edges.

[0008] Still in another preferred embodiment, the mounting assembly for a reservoir has an attachment point for the arrangement of a cover (40).

[0009] In a preferred embodiment, the mounting assembly for a reservoir presents a set of border segments (14, 15, 16, 17) placed on the upper part of the swimming pool perimeter with an arrangement adapted to the perimeter angle of the swimming pool, which may be strait, in angle, to the stairs on the left and to the stairs on the right.

[0010] In another preferred embodiment the beams (7, 8, 10, 11, 12) included in the mounting assembly for a reservoir have a tongue and groove fitting (32, 31).

[0011] Still in another preferred embodiment, the mounting assembly for a reservoir further comprises:

- a beam for reflux devices (12) with a hole (35);
- a beam for the arrangement of a skimmer attachment panel (13) having a hole (35).

[0012] The present application further discloses a process for the mounting of a reservoir comprising the following steps:

- preparing and levelling the ground;
- placing of the laying model (25) directly on the ground;
- placing of the pillars (1, 2) at the points marked on the laying model (25);
- fixing the pillars (1, 2) to the concrete slab by means of mechanical connection;
- mechanical connection of the guide (6) to the ground between each metal profile, onto the base of the pillar (1, 2) and laying of the first row of beams, whose ends will fit into the slot (29) of the metal profile;
- fixing of the connection profile (21) to the tabs on the top of the pillar (1, 2) by means of mechanical connection of the attachment points (27) of the tab and attachment points of the profile (39);
- placing of the second and subsequent rows of beams;
- placing the anchoring profile (19, 20) grounded on the recessed section (24) of the supporting profile;
- placing of beams for the right and left skimmer (10, 11);
- gluing of the border (14, 15, 16, 17) to the connection profile (21) of the pillars (1, 2).

[0013] In a preferred embodiment, laying the first row of beams in the mounting process of a reservoir includes the groove fitting of the beam (31) being embedded into the tongue fitting of the guide (30).

[0014] In another preferred embodiment of the mounting process of a reservoir, an attachment panel is affixed for the attachment of the skimmer by means of inserting the groove fitting of the skimmer attachment panel into

the tongue fitting of the beam.

[0015] In yet another preferred embodiment of the mounting process of a reservoir assembly a metal sheet is unfolded (36) inside the reservoir and is attached by mechanical connection.

[0016] In a preferred embodiment of the mounting process of a reservoir assembly, mirrors (37) are additionally arranged on the base of the pillars (1, 2).

Overview

[0017] The present embodiment describes an assembly for mounting a reservoir to the ground surface, or for wholly or partially burying thereof, consisting of beams (7, 8, 9, 10, 11, 12) stacked together. The present assembly has an adaptively laying model (25) comprising markings of exact location for the attachment of pillars (1, 2), metal pillars (1, 2) of tubular section, with tabs at the top and bottom (22, 23), a profile (21) able to simultaneously receive the anchoring profile (19, 20) for the waterproof and malleable pouch, a border (14, 15, 16, 17) and end beam (9), mirrors (37) and a metal sheet (36).

Brief description of the drawings

[0018] For an easier understanding of the art, drawings are herein attached which represent preferred embodiments which, however, are not intended to limit the scope of the present art.

Figure 1 shows an overview of the mounting assembly for a reservoir, wherein reference numbers correspond to:

- 1 - pillar;
- 2 - pillar;
- 3 - metal profile;
- 4 - metal profile;
- 7 - beam;
- 8 - beam;
- 10 - beam;
- 11 - beam;
- 12 - beam;
- 13 - skimmer attachment panel;
- 14 - border;
- 15 - border;
- 16 - border;
- 17 - border;
- 19 - anchoring profile;
- 21 - profile;
- 22 - tab on top of the pillar;
- 23 - tab on the base of the pillar;
- 25 - laying model;
- 26 - attachment point;
- 36 - metal sheet;
- 37 - mirror.

Figure 2 shows an overview of the several elements

of the mounting assembly of a reservoir, wherein reference numbers correspond to:

- 1 - pillar;
- 2 - pillar;
- 3 - metal profile;
- 4 - metal profile;
- 5 - finishing profile;
- 6 - guide;
- 7 - beam;
- 8 - beam;
- 10 - beam;
- 11 - beam;
- 12 - beam;
- 13 - skimmer attachment panel;
- 14 - border;
- 15 - border;
- 16 - border;
- 17 - border;
- 19 - anchoring profile;
- 20 - anchoring profile;
- 21 - profile;
- 24 - recessed section;
- 26 - attachment point;
- 27 - attachment point;
- 34 - tongue fitting of skimmer attachment panel;
- 37 - mirror;
- 39 - attachment points of the connection profile to the top tab of the pillar
- 40 - attachment point for the cover.

Figure 3 shows a perspective view of the right pillar, wherein reference numbers correspond to:

- 2 - pillar;
- 3 - metal profile;
- 5 - finishing profile;
- 22 - top tab of the pillar;
- 23 - bottom tab of the pillar;
- 26 - attachment point;
- 27 - attachment point;
- 29 - slot.

Figure 4 illustrates a perspective view of the angled pillar, wherein reference numbers correspond to:

- 1 - pillar;
- 4 - metal profile;
- 5 - finishing profile;
- 22 - top tab of the pillar;
- 26 - attachment point;
- 27 - attachment point.

Figure 5 shows a perspective view of the angled pillar elements, wherein reference numbers correspond to:

- 1 - pillar;

- 4 - metal profile;
- 5 - finishing profile;
- 22 - top tab of the pillar;
- 26 - attachment point;
- 27 - attachment point.

Figure 6 shows a section detail view of a pillar flanked by beams, wherein reference numbers correspond to:

- 1 - pillar;
- 6 - guide;
- 7 - beam;
- 8 - beam;
- 30 - tongue fitting of the guide.

Figure 7 shows a section detail view of a pillar flanked by beams, wherein reference numbers correspond to:

- 1 - pillar;
- 9 - beam;
- 15 - border;
- 19 - anchoring profile;
- 24 - recessed section;
- 36 - metal sheet.

Figure 8 shows a detail of a beam, wherein reference numbers correspond to:

- 12 - beam;
- 31 - groove fitting;
- 32 - tongue fitting;
- 35 - hole.

Figure 9 shows an overall perspective view of the mounting assembly for a reservoir, wherein reference numbers correspond to:

- 2 - pillar;
- 3 - metal profile;
- 5 - finishing profile;
- 8 - beam;
- 21 - Profile;
- 22 - top tab of the pillar;
- 23 - base of the pillar;
- 26 - attachment point;
- 27 - attachment point;
- 29 - slot;
- 39 - attachment point of the profile to the top tab of the pillar

Detailed description of a preferred embodiment

[0019] The present embodiment discloses a mounting assembly for a reservoir whose laying model (25) has markings on the exact location for the attachment of pillars (1, 2), joined at the base by a guide (6), on which

respective beams (7, 8, 9, 10, 11, 12) are arranged and stacked together, said assembly being tight-fitted and immobilized by means of a profile (21) adapted and able to simultaneously receive the anchoring profile (19, 20) for the waterproof and malleable pouch, border (14, 15, 16, 17) and end beam.

[0020] The present embodiment comprises a set of parts whose orderly and sequential mounting allows obtaining a reservoir which could be, by way of example, a swimming pool.

[0021] One of the elements composing the assembly is the laying model (25) with an adapted form, which is intended to be placed directly onto the ground, which has been previously stabilized and levelled, such as a concrete slab. Subsequently to the correct placement thereof on the ground, the laying model (25) accurately identifies the location of the different pillars (1, 2), thus reducing the margin of error in the arrangement thereof during levelling and vertical setting.

[0022] The assembly is further composed of pillars (1, 2), preferably made of metallic material, with tabs at the top and bottom (22, 23). The arrangement of the pillar (1, 2) of tubular section, constant over the pillar (1, 2) as a single piece, does not lack capping devices at the top, connecting devices for the border (14, 15, 16, 17) or fitting devices for the base thereof to connect to the concrete slab, thus simplifying the mounting process of the swimming pool. The pillar comprises arched edges, thus reducing the risk of damage on shipping or in case of shock. In addition, since being a single piece without joints, it optimizes the stability of the structure, reducing clearances and movement of the various structural components, given the lack of grips to be held or mounting pillar parts (1, 2).

[0023] The exclusion of the number of structure components and the increased speed and precision in mounting the assembly, are novelty features when compared to existing building systems. Levelling and vertical setting of the pillars (1, 2) are more easily obtained, allowing for a faster mounting of the reservoir, given the higher fitting accuracy of the elements among themselves. In factory, due to the tubular configuration, manufacturing the pillar (1, 2) becomes easy, with savings in terms of mounting times and consequent costs. Storage, packaging and transportation are also facilitated, given the shape thereof, thus allowing an optimization thereof. The absence of sharp edges and protrusions on the surface of the pillar (1, 2) allows an uniform attachment along the pillar (1, 2) of a metal profile (3, 4), in factory, by mechanical connection, preferably by screws, contrary to what usually occurs with pillars (1, 2) made of concrete and stony materials, since they do not assure a perfectly smooth surface. A finishing profile (5) may also be added along the profile 3 or 4 in order to conceal the screws which allow the attachment of the profile to the pillar. By using metal pillars (1, 2), the reservoir becomes lighter, thus making the transportation of assembly parts and the appropriate mounting work thereof easier. The pillars (1, 2) made of

metallic material have a higher elasticity when compared to those made of concrete or stone material, as well as provides greater mechanical resistance against shock.

[0024] The pillars (1, 2) have tabs (22, 23) in their respective ends with holes for the attachment to the concrete slab and for the attachment to the connection profile (21), respectively. The pillar (1, 2), subsequently to the fixation of the metal profile (3, 4) in factory, is intended to guide the successive stacked beams (7, 8, 9, 10, 11, 12), by means of the slot (29) present along the profile (3, 4).

[0025] The present embodiment shows a connection profile (21) between the pillars (1, 2) and for the attachment of the anchoring profile (19, 20) for the waterproof and malleable pouch. This connection profile (21) has an adapted shape and a U-shaped recessed section (24) enabling the seating of the anchoring profile (19, 20) for the attachment of the waterproof and flexible pouch. It is presented as a single piece, and allows the connection of several structural elements among themselves: it connects the several pillars (1, 2); it is the laying base for the border (14, 15, 16, 17); it allows fitting the top beam, creating a supportive assembly, thus increasing the robustness and stability of the final assembly. It has attachment points (39) to the top tab of the pillar (1, 2) the points being used for the attachment of the profile to the pillars (1, 2) by mechanical connection, for example by introducing a screw and retaining washer on the attachment points (27). It also provides an attachment point for applying a cover (40).

[0026] In addition to the elements listed above, the assembly is also composed of different types of beams (7, 8, 9, 10, 11, 12) and border (14, 15, 16, 17) which may be, by way of example, made of mortar and present a type deck finishing.

[0027] The manufacture of the elements in the mortar assembly begins with the preparation of mortar, being subsequently poured into moulds of suitable configuration. Subsequently to the drying time, the elements are removed from the mould and are ready to be assembled.

[0028] The beams (7, 8, 10, 11, 12) have a groove and tongue fitting (32, 31), except for the top beam (9).

[0029] The assembly provides a beam for reflux devices (12) with a hole (35) for several accessories, as well as a beam for applying a skimmer attachment panel (13), which is preferably made of metal material, with a hole (35) for the introduction of the skimmer, provided with a tongue and groove fitting system (32, 31) similar to and compatible with that of the beams.

[0030] The anchoring profile (19, 20) for the attachment of a waterproof and malleable pouch consists of polymeric material having a cavity for the attachment of a covering.

[0031] The assembly also presents a set of border segments (14, 15, 16, 17) arranged on the upper part of the swimming pool perimeter, and which have a design adapted to the angle of the swimming pool perimeter, which may be straight or in angle to the stairs on the left

and to the stairs on the right.

[0032] Mounting the parts comprising the assembly begins with arranging the laying model (25) directly onto the ground, previously prepared and levelled, such as a concrete slab, followed by placement of the abutments (1, 2) at the points marked on the laying model (25). The attachment of the pillars (1, 2) to the concrete slab is carried out by mechanical connection, for example by introducing bushing screws, at the attachment points (26) of the base tab of the pillar (1, 2). Subsequently, the guide (6) is screwed to the concrete slab between each metal profile at the base of the pillar (1, 2). Subsequently, the laying of the first row of beams is carried out, the ends of which will fit into the slot (29) of the metal profile, bearing in mind that in the first row the groove fitting of the beam shall embed in the tongue fitting of the guide (30).

[0033] This is followed by the attachment of the connection profile (21) to the top tabs of the pillar (1, 2) by inserting screws and retaining washers in the attachment points (27) of the tab and in the attachment points of the profile. This operation creates a locking strap around the entire perimeter of the reservoir, thus enhancing the stability of the structure.

[0034] The mounting of the assembly continues with the placement of the second and following rows of beams, taking into account that the groove fitting of the beam must fit into the tongue fitting of the beam. In the last row, the end beam is arranged.

[0035] Subsequently, the placement of anchoring profile (19, 20) for the attachment of the waterproof malleable pouch is carried out along the top perimeter thereof, based on the recessed section (24) of the supporting profile.

[0036] The placement of swimming pool filtering material, such as the designated skimmer, is provided by right and left skimmer beams (10, 11), whose arrangement follows the mounting logic of the beams mentioned above. In the interval between the left and right skimmer beams, the skimmer attachment panel (13) is arranged and attached by means of the groove fitting of the skimmer attachment panel that will fit the tongue fitting on the beam. The tongue fitting of the skimmer attachment panel (34) allows a fitting under the supporting profile.

[0037] The border (14, 15, 16, 17) is subsequently glued to the connection profile (21) of the pillars (1, 2) and other water filtration or circulation equipment is arranged, using the hole (35) for additional attachments of a drilled beam. In order to evenly distribute stress exerted by the water and to smooth the interior of the swimming pool, a metal sheet (36) is unfolded and attached by mechanical connection, preferably by screws.

[0038] Finally, the reservoir is lined with a waterproof and malleable pouch, fixed by fitting onto the cavity provided for the purpose on the anchoring profile (19, 20). Mirrors (37) are finally arranged at the base of the pillars (1, 2), thereby concealing the visible screws used for the attachment of the pillar (1, 2) to the concrete slab.

[0039] The present embodiment is obviously not re-

stricted in any way to the embodiments herein described and a person of ordinary skill in the art may provide many possibilities to modifications thereof without departing from the general spirit of the invention as defined in the claims.

[0040] The preferred embodiments described above are obviously combinable with each other. The following claims define further preferred embodiments.

Claims

1. Assembly for mounting a reservoir to the ground surface or for fully or partially burying thereof, consisting of metal guides (6), beams (7, 8, 9, 10, 11, 12) stacked together, comprising:
 - a laying model (25) with markings of exact location for the attachment of pillars (1, 2);
 - pillars (1, 2) with tabs at the top and bottom (22, 23);
 - a profile (21) able to simultaneously receive the anchoring profile (19, 20) for the waterproof malleable pouch, the border (14, 15, 16, 17) and end beam (9);
 - a mirror (37);
 - a metal sheet (36).
2. Mounting assembly for a reservoir according to the preceding claim, wherein the profile (21) has a U-shaped recessed section (24) for laying the anchoring profile (19, 20) by means of mechanical connection in the attachment points (39).
3. Mounting assembly for a reservoir according to claim 1, wherein the pillars (1, 2) have arched edges.
4. Mounting assembly for a reservoir according to any of the preceding claims, wherein a point of attachment is provided for the arrangement of a cover (40).
5. Mounting assembly for a reservoir according to any of the preceding claims, wherein a set of border segments (14, 15, 16, 17) is provided, placed on the upper part of the swimming pool perimeter with a design adapted to the perimeter angle of the swimming pool, which may be straight, in angle, to the stairs on the left and stairs on the right.
6. Mounting assembly for a reservoir according to any of the preceding claims, wherein the beams (7, 8, 10, 11, 12) have a tongue and groove fitting (31, 32).
7. Mounting assembly for a reservoir according to any of the preceding claims, wherein it further comprises:
 - a beam for reflux devices (12) with a hole (35);
 - a beam for the arrangement of a skimmer at-

tachment panel (13) having a hole (35).

8. Process for mounting a reservoir assembly according to any of claims 1 to 7 comprising the following steps:
 - preparing and levelling the ground;
 - placing of the laying model (25) directly onto the ground;
 - placing of the pillars (1, 2) at the points marked on the laying model (25);
 - fixing the pillars (1, 2) to the concrete slab by means of mechanical connection;
 - mechanical connection of the guide (6) to the ground between each metal profile, onto the base of the pillar (1, 2) and laying of the first row of beams, whose ends will fit into the slot (29) of the metal profile;
 - attaching of the connection profile (21) to the tabs on the top of the pillar (1, 2) by means of mechanical connection on the attachment points (27) on the tab and attachment points of the profile;
 - placing of the second and subsequent rows of beams;
 - placing the anchoring profile (19, 20) grounded on the recessed section (24) of the supporting profile;
 - placing of beams for the right and left skimmer (10, 11);
 - gluing of the border (14, 15, 16, 17) to the connection profile (21) of the pillars (1, 2).
9. Process for mounting a reservoir assembly according to the preceding claim, wherein in the laying of the first row of beams, the groove fitting of the beam will embed in the tongue fitting of the guide (30).
10. Process for mounting a reservoir assembly according to any claims 8 and 9, wherein a panel for the attachment of the skimmer is attached by means of the groove fitting of the skimmer attachment panel, which will fit the tongue fitting of the beam.
11. Process for mounting a reservoir assembly according to any claims 8 to 10, wherein a metal sheet (36) is additionally unfolded inside the reservoir and which is fixed by mechanical connection.
12. Process for mounting a reservoir assembly according to any claims 8 to 11, wherein mirrors (37) are additionally arranged at the base of the pillars (1, 2).

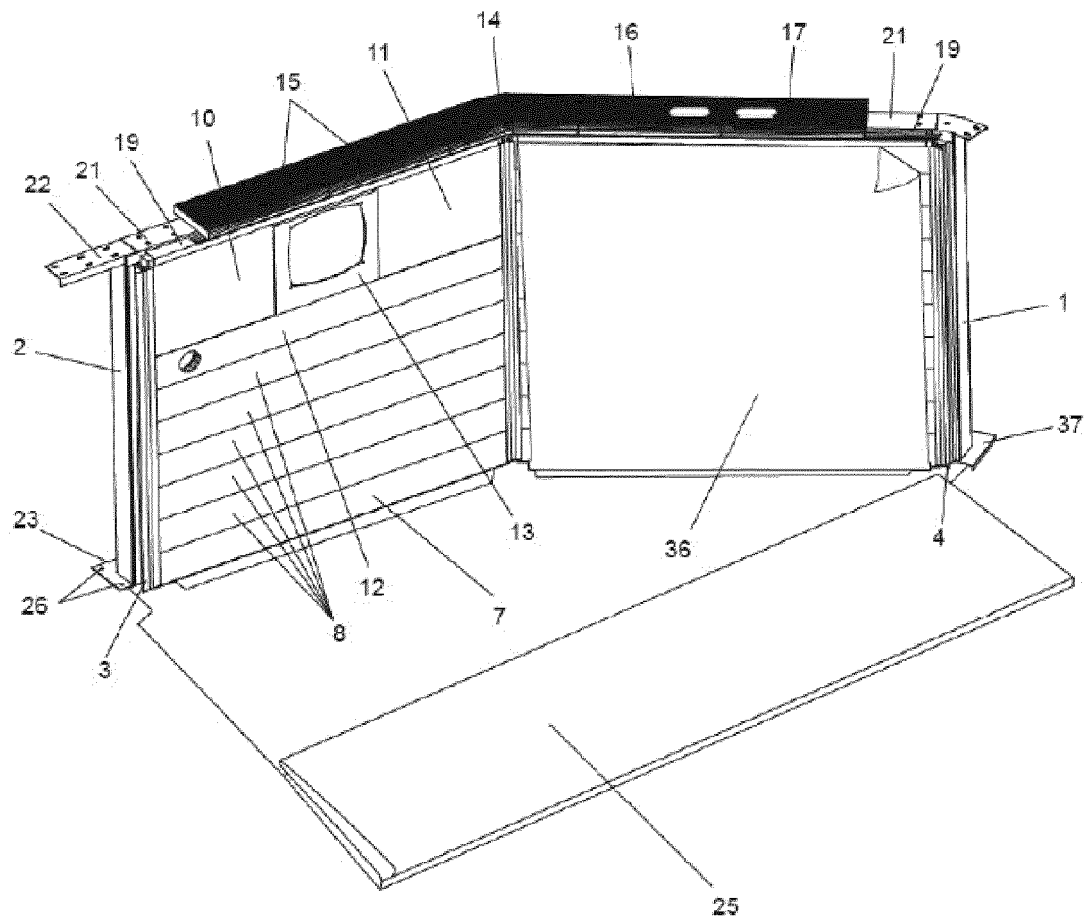


Figure 1

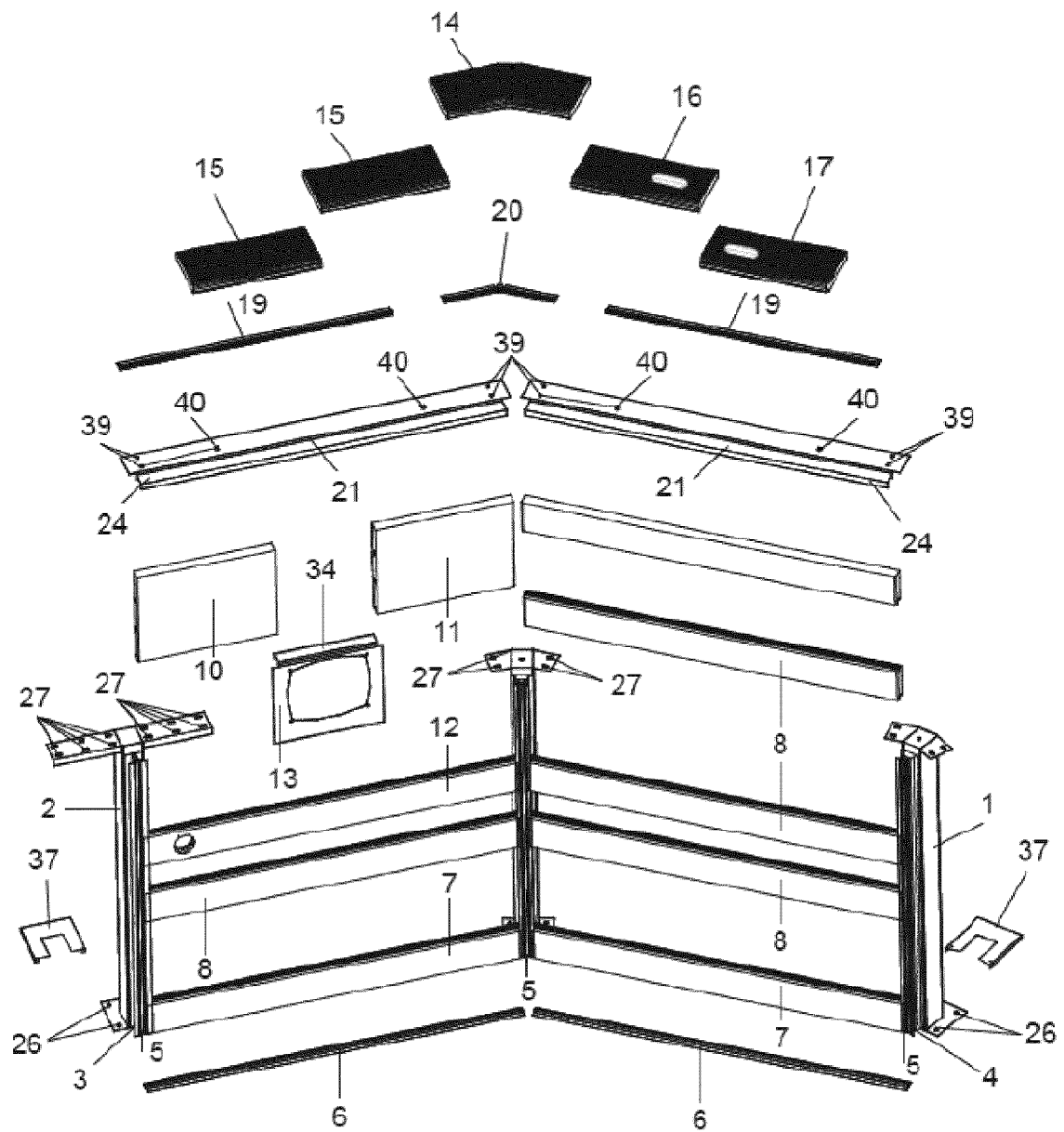


Figure 2

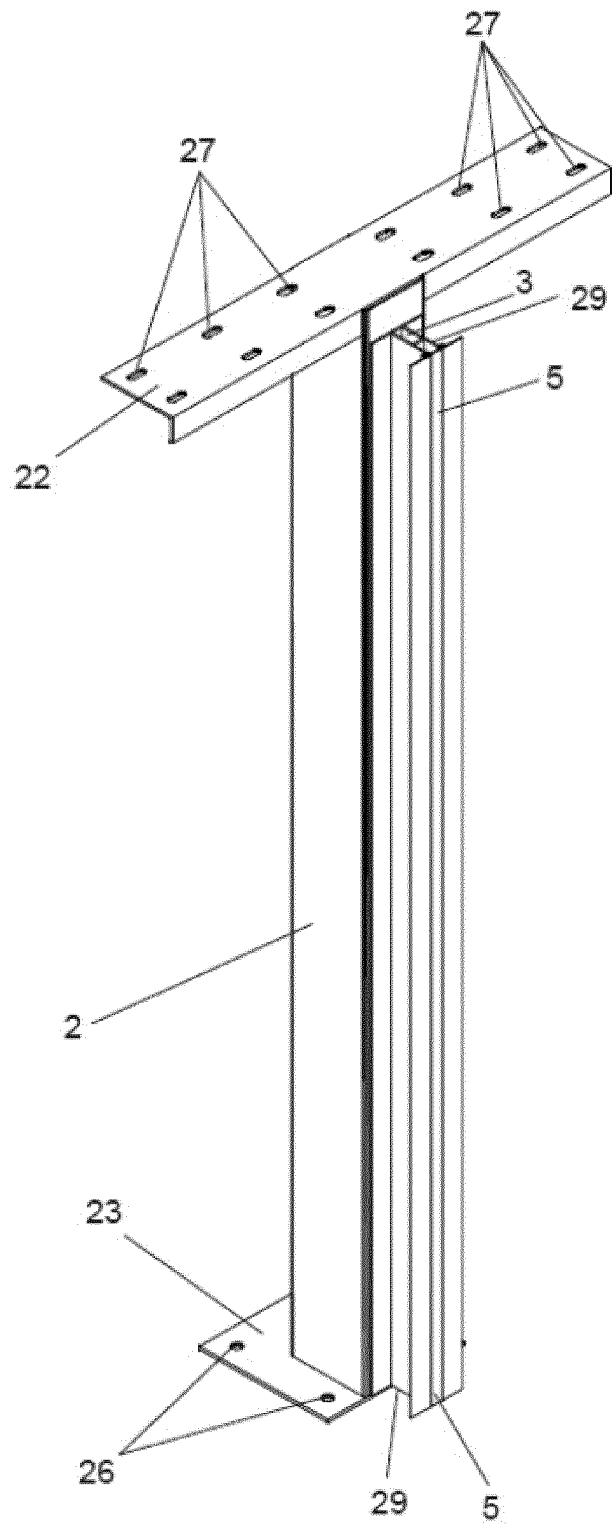


Figure 3

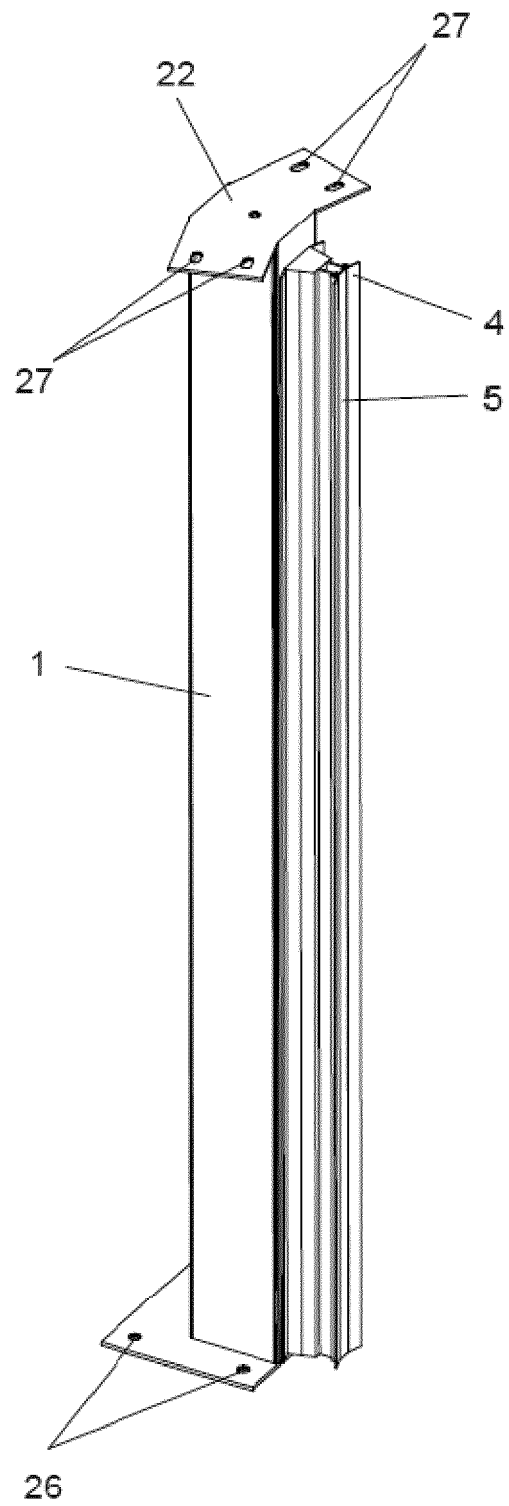


Figure 4

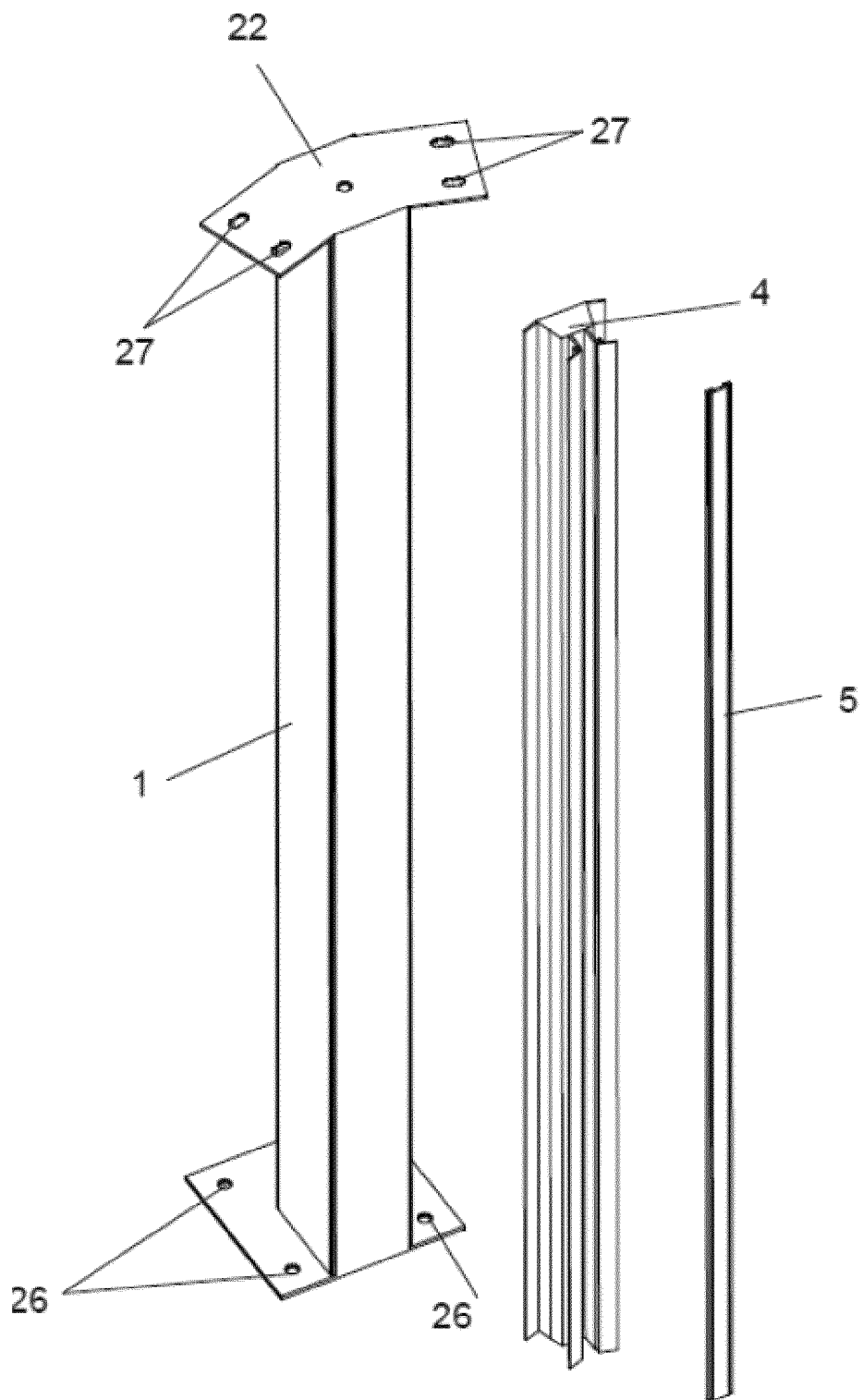


Figure 5

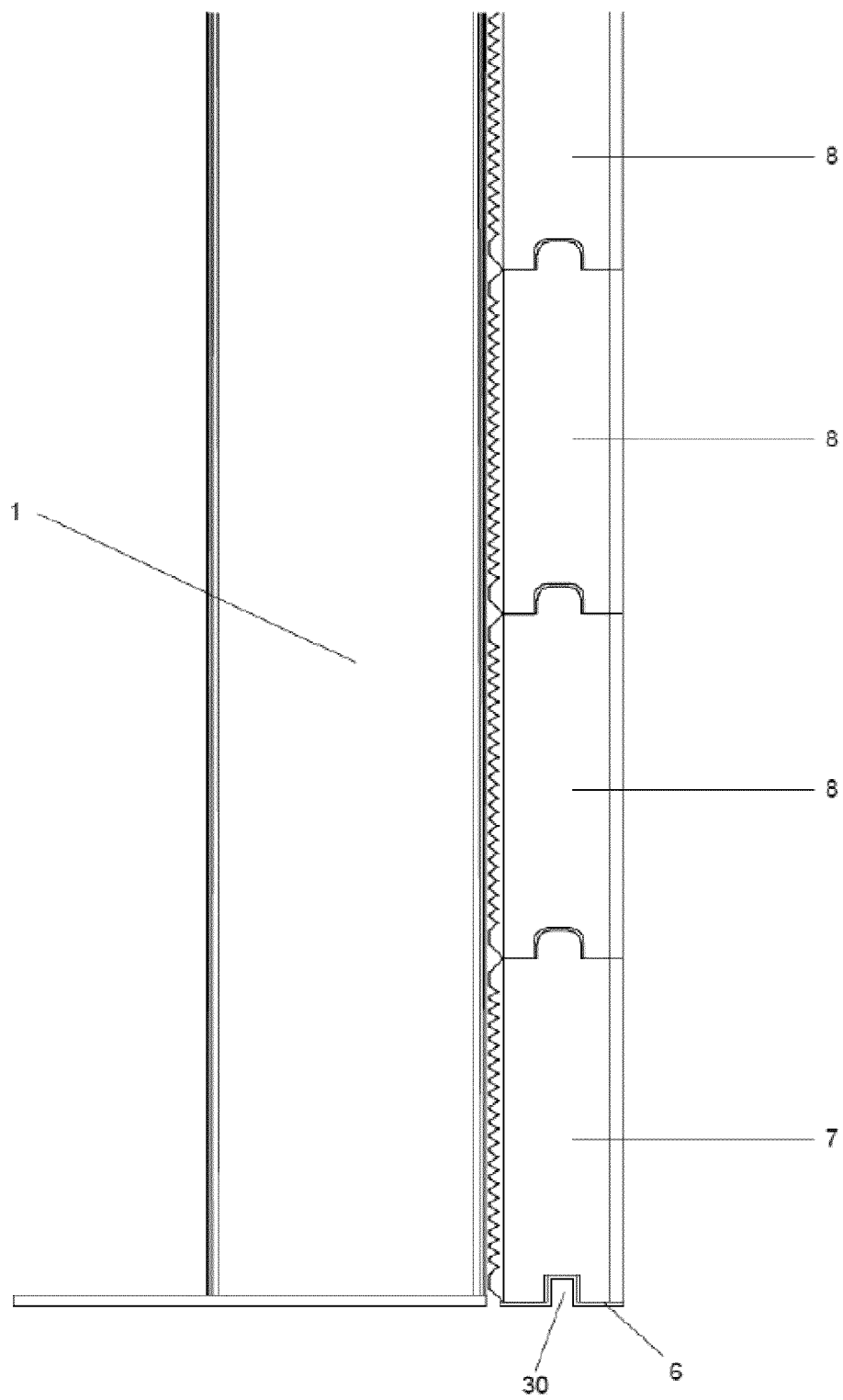


Figure 6

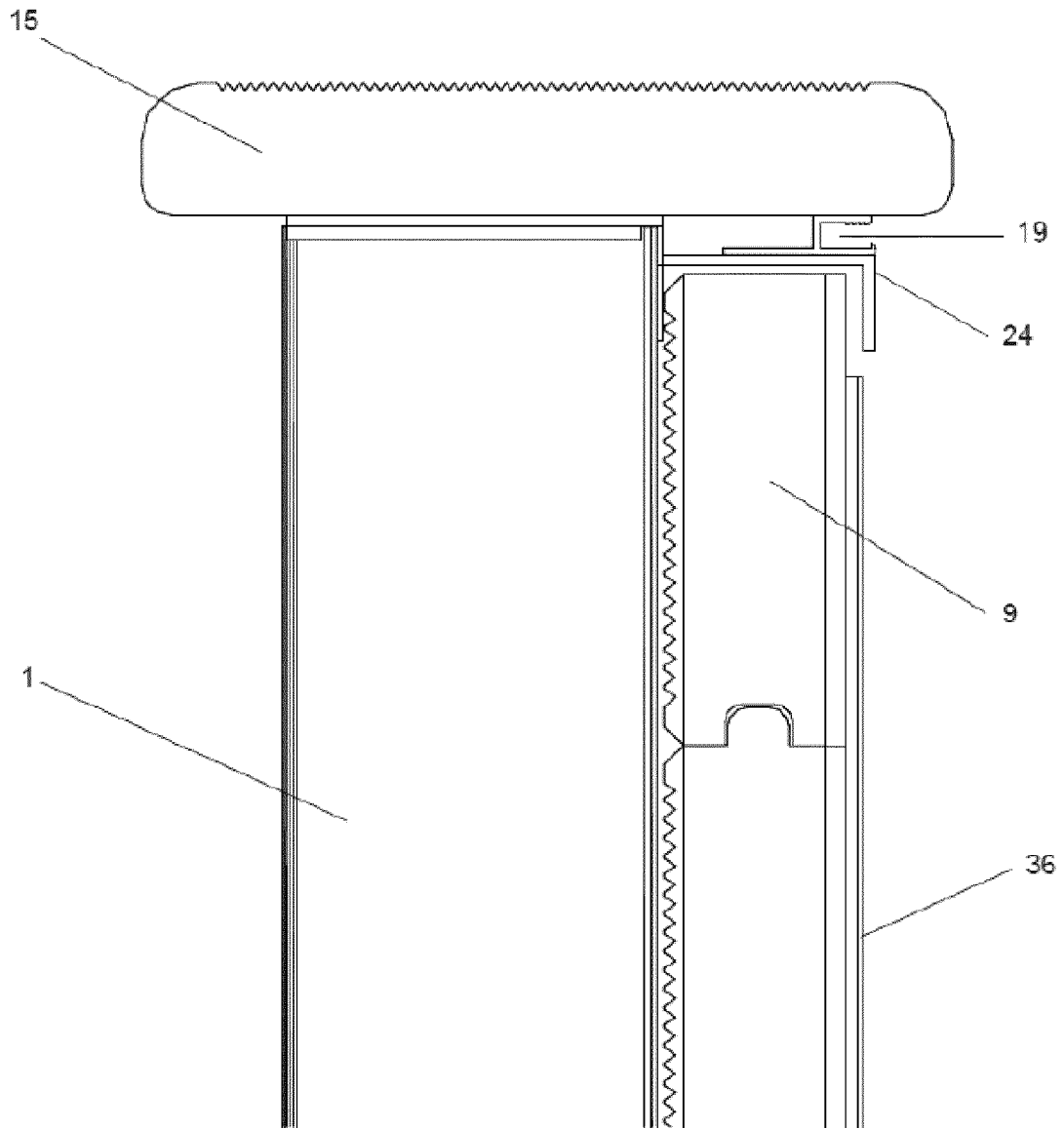


Figure 7

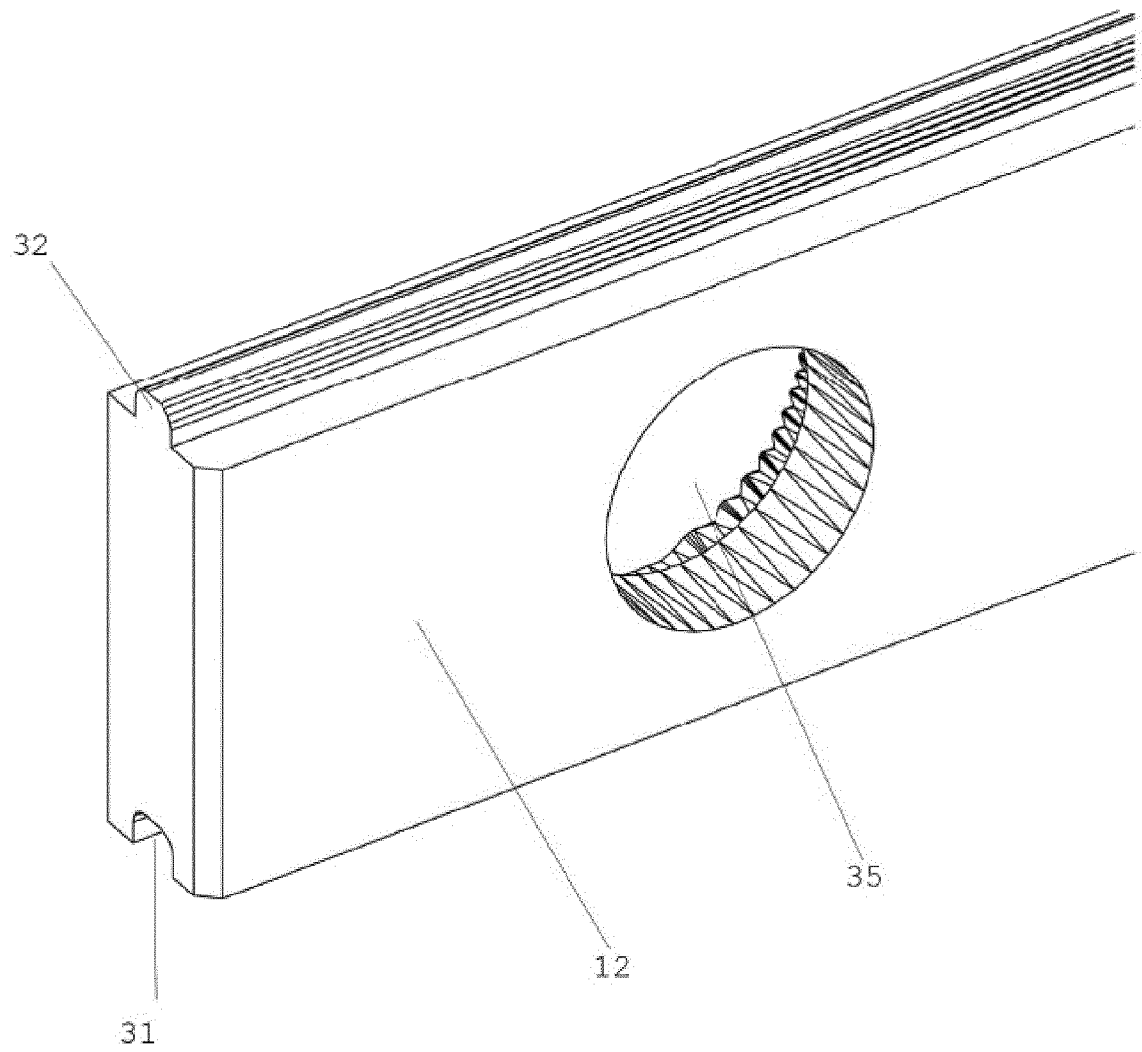


Figure 8

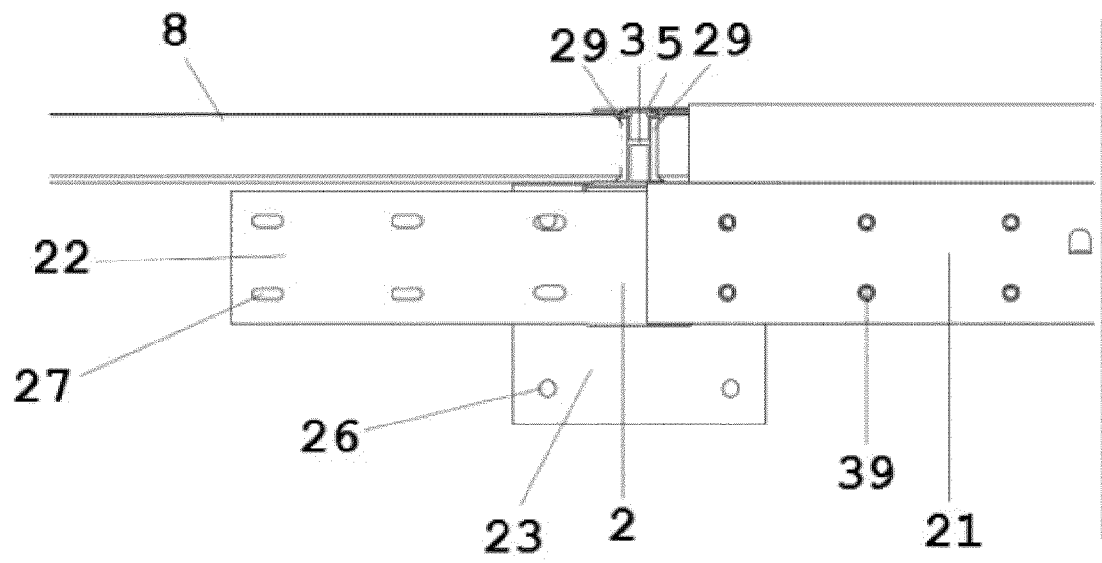


Figure 9



EUROPEAN SEARCH REPORT

Application Number
EP 13 17 3084

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (IPC) E04H
Place of search Munich		Date of completion of the search 24 September 2013	Examiner Schnedler, Marlon
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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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 13 17 3084

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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