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(54) **KIT FOR MAKING A PARTITION IN AN INSULATING GLASS**

(57) A kit (1) for making a partition in an insulating glass, said glass being provided with a perimeter frame (2) and at least two sheets of glass (L), comprising at least one internal partition grid (P), which can be fixed to said perimeter frame (2) through fixing means (8), comprising a plurality of profiles (1a,1b), variously combined and mutually connectable, by means of at least one universal connecting element (6) to create one or more crossing zones inside the volume enclosed by said glass sheets (L). The kit (1) further comprises at least two external partition grids (9), which can be fixed to the outer

surfaces of the respective glass sheets (L) of the insulating glass, configured so as to cover the internal partition grid (P) by exactly matching the latter. Each of the profiles (1a, 1b) comprises at least a first perimeter portion (10) and at least a second perimeter portion (11) opposed, flat or substantially flat, arranged orthogonally to the glass sheets (L); the external partition grids (9) are suitable for completely covering said profiles (1a,1b) with the exception of said first perimeter portions (10) and second perimeter portions (11).

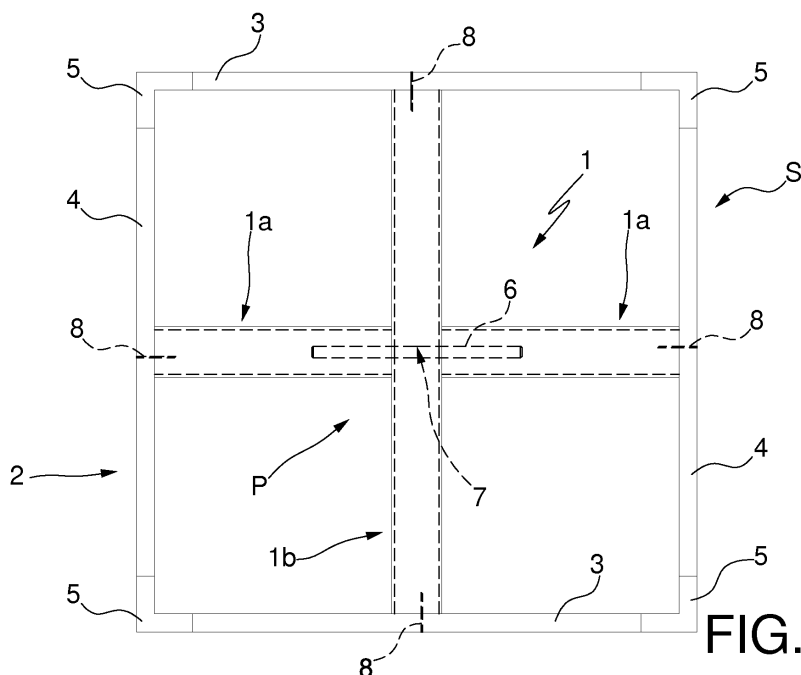


**FIG. 4**

## Description

### TECHNICAL FIELD OF THE INVENTION

**[0001]** The present invention relates to a kit for making a partition in an insulating glass. More specifically, the present invention relates to a kit for making a partition in an insulating glass in the so-called English, or Viennese, style.

### DESCRIPTION OF THE PRIOR ART

**[0002]** As is known insulating glass, also known as double glazing units, consists of two or more flat glass sheets joined together along the perimeter by a spacer frame, made of metal, polymeric, or mixed material, which constitutes the support structure.

**[0003]** This spacer frame may have one or more grooves and/or micro-holes to allow the molecular sieves to absorb the residual moisture of the insulating glass volume. The spacer frame is in fact shaped so that dehydrating salts can be contained inside it, which precisely prevent the formation of condensate in the volume between the glass sheets.

**[0004]** Moreover, the glass sheets are separated by a layer of air or gas, e.g. argon, krypton, or xenon.

**[0005]** The most widely used gas is argon which, like other gases, increases the thermal insulation of the product with respect to air.

**[0006]** Currently, the vast majority of the insulating glass produced contains gas.

**[0007]** Seals are then normally applied both between the spacer frame and the glass sheets, and externally to the same sheets, at their perimeter edge.

**[0008]** Some insulating glass walls on the market are made in the so-called English or Viennese style, with profiles machined and assembled in order to reproduce the partitions of the windows with architectural patterns inside the insulating glass walls.

**[0009]** In other words, within the glass, partitions are created using the aforementioned profiles according to the most diverse designs.

**[0010]** These profiles, which have a mostly tubular or rectangular section, in any case closed, once assembled with adequate accessories, which actually act as plugs, contain air internally.

**[0011]** In the event that the insulating glass is filled with gas, the air contained in the above mentioned profiles will remain inside the insulating glass, significantly reducing the percentage of gas filling.

**[0012]** The percentage of air contained in the partition profiles usually ranges from 5% to 8%, which is a significant amount.

**[0013]** These profiles on the inside of the insulating glass can be exposed, or covered with other profiles, externally to the glass sheets, and superimposed over them.

**[0014]** In the latter case, which is of particular interest

within the scope of the present invention, the aforementioned external profiles reproduce the appearance of the perimeter profile, thus giving the impression that there are as many glass blocks as there are squares.

**[0015]** The assembly system for the construction of the above described partitions currently provides for the use of profiles and accessories. For each profile size there are dedicated accessories.

**[0016]** Figure 1 shows an exploded view of a known, very common solution for obtaining an insulating glass support structure with a frame comprising the aforementioned partitions; while in Figure 2 the same solution, assembled, is shown in cross section.

**[0017]** The solution comprises a perimeter frame A and a grid B of an internal partition, the latter consisting of an upright C and a crosspiece D.

**[0018]** In the illustrated solution, both the upright M and the crosspiece T comprise two respective profiles E connected in such a way as to obtain a cross-shaped structure. The assembly accessories normally comprise a central junction kit F (e.g. a four-way cross with or without an anti-vibration buffer) to join the profiles E of the upright C and of the crosspiece D, and end pieces G, to join the ends of the upright C and of the crosspiece D to the perimeter frame A (for example by means of clips H, or ratchet nails, screws, rivets, or other similar means).

**[0019]** The processes to be carried out to obtain the solution described above normally comprise cutting the individual pieces to size, assembling with the joints (for example the crosses) inserting the end pieces and fixing them to the perimeter frame.

**[0020]** The profiles E for making the grid B generally have a rectangular hollow shape; they generally have, in the visible part, i.e. the outer surface, one or more grooves - possibly with micro-holes which have a solely aesthetic function - to mimic the appearance of the perimeter profile used, and thus recreate the desired partition. The profiles can also appear smooth.

**[0021]** The central junction kit F, in many known solutions, comprises a four-way cross piece, made of plastic material, possibly fitted with anti-vibration buffers.

**[0022]** One of the main drawbacks of the known solutions consists in the fact that, for each type (dimensions and finish) of profiles E, there exists a given set of assembly accessories suitable for the dimensions of the same profiles E: in other words, each profile E has its own specific central junction kit F and its own specific end piece G.

**[0023]** It should be noted that the aforesaid H profiles do not have a load bearing function, but only an aesthetic one, in other words they do not bear the weight of the glass sheets, but only need to mimic the windows' partition, matching as well as possible, from an aesthetic point of view, the perimeter frame A.

**[0024]** Consequently, both the costs of assembly operations - which are numerous and therefore burdensome - and the costs associated with the preparation of various assembly accessories for different profiles are

currently too high for product parts which, as mentioned, have only an aesthetic function.

**[0025]** It should also be noted that the four-way cross junction solution, currently used, allows only 90° cross-pattern assemblies to be carried out; it is not possible to obtain "T" fittings or fittings with angles different from 90°.

**[0026]** In addition, it is observed that, in the currently used solutions, the end pieces G are clearly visible inside the partition, even if the thickness of the visible portion V is minimal.

**[0027]** The end piece G is usually made of polyethylene, a simpler material to be fixed with clips or similar systems, which is notoriously milky coloured, and not coloured like the profile E: this means that any colour differences between the profile E and its respective end piece G are visible in any case, and they can create an unpleasant aesthetic result.

**[0028]** If the end piece is coloured with masters close to those of the profiles, the same finish will not be obtained anyway.

**[0029]** Another drawback of the known solutions consists in the fact that the closed section profiles E retain air inside them, which does not have the same thermal insulation properties as the gases (e.g. argon, and others) normally used.

**[0030]** Given the permeability of the plastic, the air contained in the profiles that form the partition will come out and will be present in the insulating glass together with other gas with which the same partition had been filled, reducing its thermal insulation characteristics.

## OBJECTS OF THE INVENTION

**[0031]** The technical aim of the present invention is to improve the state of the art in the field of the production of insulating glass with internal partition in the English or Viennese style.

**[0032]** Within such technical aim, it is an object of the present invention to develop a kit to implement a partition in an insulating glass which allows the aforementioned drawbacks to be overcome.

**[0033]** Another object of the present invention is to provide a kit for making a partition in an insulating glass which eliminates the need to have different assembly accessories for profiles of different types and/or dimensions, so as to reduce the storage and production costs.

**[0034]** A further object of the present invention is to provide a kit for making a partition in an insulating glass which allows the assembly costs of the current solutions to be reduced.

**[0035]** Another object of the present invention is to provide a kit for making a partition in an insulating glass which allows partition configurations to be obtained different from the normal cross pattern with 90° angles, i.e. for example "T" shaped configurations, or with cross angles other than 90°, or yet other configurations. Another object of the present invention is to provide a kit for making a partition in an insulating glass which allows a drastic

reduction, or the elimination, of the air contained (and retained) in the assembled tubular profiles, so as to maximise gas filling in the insulating glass.

**[0036]** This aim and these objects are all achieved by the kit to make a partition in an insulating glass according to the attached claim 1.

**[0037]** The kit according to the invention comprises at least one internal partition grid, which can be fixed to the perimeter frame of the insulating glass by means of fixing means, comprising a plurality of variously combinable and mutually connectable profiles, via at least one universal connection element, to make one or more cross pattern areas inside the volume enclosed by the glass sheets of the insulating glass. According to an aspect of the invention, the kit further comprises at least two external partition grids, which can be fixed to the outer surfaces of the respective glass sheets of the insulating glass, configured so as to cover the internal partition grid by exactly overlapping the latter.

**[0038]** Moreover, each of the profiles of the internal partition grid comprises at least one first perimeter portion and at least one second perimeter portion, opposed, flat or substantially flat, arranged orthogonally to the planes of the glass sheets.

**[0039]** The external partition grids are therefore suitable for completely covering the profiles of the internal partition grid with the exception of the first perimeter portions and second perimeter portions, which are visible from the outside, even from various angles.

**[0040]** The combination of the internal partition grid, implemented with profiles implemented in the described manner, and of two external partition grids exactly matching the internal partition grid, allows an aesthetic result to be obtained which is very similar to a glass with a real English or Viennese style partition.

**[0041]** The first perimeter portion and the second perimeter portion, flat or substantially flat, of the profiles of the internal partition grid allow aesthetic continuity with the perimeter frame of the insulating glass to be obtained.

**[0042]** At the same time, these flat perimeter portions allow cross patterns to be obtained between perfectly matching and aesthetically clean profiles, without, in any case, the need for further processing at the ends of the same profiles.

**[0043]** The discontinuities between the profiles and the end pieces in known type solutions are thus also eliminated.

**[0044]** The profiles can be connected via unified connecting elements also for profiles of different sizes, shapes and colours, since the crossing zones are completely hidden from sight by the external partition grids.

**[0045]** This allows for a considerable reduction in the number of components in storage required to make the kits.

**[0046]** Dependent claims refer to preferred and advantageous embodiments of the invention.

## BRIEF DESCRIPTION OF DRAWINGS.

**[0047]** These and further advantages will be better understood by any man skilled in the art from the following description and accompanying drawings, provided by way of non-limiting example, in which:

Figure 1 is an exploded view of a solution of a known type for making a support frame with an internal glass partition grid;

Figure 2 is a cross section of the solution of Figure 1, assembled;

Figure 3 is an exploded view of the supporting structure of an insulating glass with some parts of the partition kit, according to the present invention;

Figure 4 is a front view of the support structure of Figure 3, assembled;

Figure 5 is a front view of a supporting structure of an insulating glass with some parts of the partition kit, according to the present invention, with a different configuration;

Figure 6 is a front view of a supporting structure of an insulating glass with some parts of the partition kit according to the present invention, with yet another different configuration;

Figure 7 is an axonometric view of a detail of an insulating glass comprising the kit according to the present invention;

Figure 8 is an axonometric view of the kit, with some parts removed for greater clarity;

Figure 9 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to the present invention;

Figure 10 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to another embodiment of the present invention;

Figure 11 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 12 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 13 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 14 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 15 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 16 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 17 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 18 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 19 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 20 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 21 is a view of the kit profile cross section

according to another embodiment of the invention; Figure 22 is a view of the cross section of a same middle portion of the profile of Figure 21 and of various perimeter portions that can be associated with such middle portion;

Figure 23 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 24 is a view of the cross section of a same middle portion of the profile of Figure 23 and of various perimeter portions that can be associated with such middle portion;

Figure 25 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to another embodiment of the present invention;

Figure 26 is a view of the kit profile cross section in the embodiment of Figure 25;

Figure 27 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to another embodiment of the present invention;

Figure 28 is a view of the kit profile cross section in the embodiment of Figure 27;

Figure 29 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to another embodiment of the present invention;

Figure 30 is a view of the kit profile cross section in the embodiment of Figure 29;

Figure 31 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to another embodiment of the present invention;

Figure 32 is a view of the kit profile cross section in the embodiment of Figure 31;

Figure 33 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to another embodiment of the present invention;

Figure 34 is a detailed side view, with some parts removed for greater clarity, of an insulating glass with a partition kit, according to an embodiment of the invention, during filling of the same glass with the insulating gas;

Figure 35 is a view of the kit profile cross section according to another embodiment of the invention;

Figure 36 is an exploded view of the supporting structure of an insulating glass with some parts of the partition kit, according to the present invention;

Figure 37 is a front view of the support structure of Figure 36, in an assembled configuration;

Figure 38 is an exploded view of the supporting structure of an insulating glass with some parts of the partition kit, according to the present invention;

Figure 39 is a front view of the support structure of Figure 38, in an assembled configuration;

Figure 40 is an exploded view of the supporting structure of an insulating glass with some parts of the

partition kit, according to the present invention;  
 Figure 41 is a front view of the support structure of  
 Figure 40, in an assembled configuration;  
 Figure 42 is an exploded view of the supporting structure of an insulating glass with some parts of the partition kit, according to the present invention;  
 Figure 43 is a front view of the support structure of  
 Figure 47, in an assembled configuration;  
 Figure 44 is an exploded view of the supporting structure of an insulating glass with some parts of the partition kit, according to the present invention;  
 Figure 45 is a front view of the support structure of  
 Figure 40, in an assembled configuration;  
 Figure 46 is a front view of the universal kit connecting element in the embodiment of Figures 36,37;  
 Figure 47 is a side view of the universal connecting element of Figure 46;  
 Figure 48 is a cross-section of the kit profile in the embodiment of Figures 36,37, corresponding to one of its crossing zones;  
 Figure 49 is a front view of the universal kit connecting element in the embodiment of Figures 38,39;  
 Figure 50 is a side view of the universal connecting element of Figure 49;  
 Figure 51 is a cross-section of the kit profile in the embodiment of Figures 38,39, corresponding to one of its crossing zones;  
 Figure 52 is a front view of the universal kit connecting element in the embodiment of Figures 40,41;  
 Figure 53 is a side view of the universal connecting element of Figure 52;  
 Figure 54 is a kit profile cross section in the embodiment of Figures 40, 41;  
 Figure 55 is a front view of the universal kit connecting element in the embodiment of Figures 42,43;  
 Figure 56 is a side view of the universal connecting element of Figure 55;  
 Figure 57 is a kit profile cross section in the embodiment of Figures 42, 43;  
 Figure 58 is a front view of the universal kit connecting element in the embodiment of Figures 44,45;  
 Figure 59 is a side view of the universal connecting element of Figure 58.

#### EMBODIMENTS OF THE INVENTION.

**[0048]** Figure 3 shows an exploded view of a support structure S of an insulating glass. Moreover, in Figure 3 some parts of the kit are shown to make a partition in an insulating glass, indicated globally with 1.

**[0049]** The support structure comprises a perimeter frame 2; in the specific application example shown, the perimeter frame 2 comprises four rectilinear elements 3,4, and four corner elements 5 which connect the afore-said rectilinear elements 3,4.

**[0050]** The rectilinear elements 4 and the corner elements 5 may be of any shape and size; moreover, they can be made of any material suitable for the application.

**[0051]** In the specific embodiment shown in Figures 3,4, the rectilinear elements 4 consist of profiles made of a plastic or metal/plastic coupled material, the plastic part of which is visually exposed.

**[0052]** Also the corner elements 5 can be made from the same material with which the rectilinear elements 4 are made, or also from different materials, without any restriction.

**[0053]** Figure 4 shows the same support structure S of the insulating glass, in an assembled configuration.

**[0054]** Kit 1 comprises at least one internal partition grid P, which can be assembled inside the support structure S, i.e. inside the perimeter frame 2.

**[0055]** In other words, the internal partition grid P is intended to be inserted between two glass sheets L of an insulating glass.

**[0056]** The internal partition grid P, in turn, comprises a plurality of profiles 1a,1b.

**[0057]** The profiles 1a,1b can be variously combined to obtain, inside the perimeter frame 2, any partition of the glass surface.

**[0058]** For example, the internal partition grid P comprises at least one first profile 1a and at least one second profile 1b.

**[0059]** More in detail, the internal partition grid P comprises a first profile 1a to make the upright (or the cross-piece), and two second profiles 1b aligned to form the crosspiece (or the upright).

**[0060]** Then the internal partition grid P consists substantially of a cross, assembled using three profiles 1a,1b according to the present invention.

**[0061]** The profiles 1a,1b are preferably made of plastic material: they can be made, for example, of PVC, polypropylene, ABS, polycarbonate, or a mixture of two or more of these polymers, or in any other suitable plastic material.

**[0062]** The internal partition grid P also comprises at least one universal (or single, or unified) connecting element 6, suitable for creating a junction between at least two profiles 1a,1b (i.e. at least one first profile 1a and one second profile 1b).

**[0063]** By the adjective "universal" it is intended that this connecting element 6 is independent of the specific characteristics (dimensions, shape) of the various profiles 1a,1b.

**[0064]** For example, this universal connecting element 6 can be suitable to make the head joint of at least one first profile 1a with at least one second profile 1b of the internal partition grid P.

**[0065]** This universal connecting element 6 - as provided in the embodiment of Figures 3,4 - can cross, at least partially, at least one of the profiles 1a,1b which form the internal partition grid P.

**[0066]** In the same embodiment, the universal connecting element 6 implements the head junction of two first aligned profiles 1a, which make up the crosspiece (or the upright) of the internal partition grid P; the same universal connecting element 6, to obtain this joint, cross-

es the second profile 1b throughout, which is used to obtain the upright (or the crosspiece) of the same internal partition grid P.

**[0067]** Therefore, in this embodiment, the second profile 1b comprises a drilling 7, through which goes the universal connecting element 6.

**[0068]** The internal partition grid P can be connected directly to the perimeter frame 2 with fixing means 8 available on the market (e.g. clips, ratchet nails, screws, rivets, etc.) and without the need to resort to end pieces, or other similar elements made to measure in relation to the specific types of profile.

**[0069]** The assembly configuration of the support structure S in the embodiment of Figures 3,4 is illustrated by way of (non limiting) example only.

**[0070]** Various other assembly configurations of a perimeter frame 2 with the internal partition grid P are possible.

**[0071]** For example, Figure 5 illustrates another possible embodiment of the invention, wherein the internal partition grid P of the kit 1 is not cross-shaped like in the previous case, but has a "T" configuration.

**[0072]** In this configuration, the universal connecting element 6 allows the joint to be obtained between the head of a single first profile 1a and the side of a second profile 1b.

**[0073]** The first profile 1a and the second profile 1b form between each other, in this case, an angle of 90°.

**[0074]** The second profile 1b, therefore, comprises a blind drilling 7 wherein one end of the universal connecting element 6 is inserted.

**[0075]** Figure 6 illustrates another possible embodiment of the invention, wherein the internal partition grid P of the kit 1 comprises two profiles 1a, 1b connected so as to form an angle different from 90° (substantially a Y- or V-shaped configuration). As a difference with respect to the embodiment of Figure 5, the end faces of the first profile 1a are cut to a certain slant (different from 90°) with respect to the longitudinal axis of the first profile 1a itself.

**[0076]** Also, the blind drilling 7 made in the second profile 1b has an inclined axis, with respect to the longitudinal axis of the same second profile 1b, so as to form with the latter an angle different from 90°, to allow for correct insertion of the universal connecting element 6.

**[0077]** In other embodiments of the invention, the profiles 1a, 1b of the internal partition grid P can be assembled to have any other mutual slant, without limitations. According to another aspect of the invention, the kit 1 comprises at least two external partition grids 9.

**[0078]** The external partition grids 9 can be fixed to the outer surfaces of two respective glass sheets L of the insulating glass; this is shown in detail in Figure 7.

**[0079]** The fixing of the external partition grids 9 to the glass sheets L may take place, for example, with adhesives, or the like.

**[0080]** Each external partition grid 9 defines, on the outer surface of the glass sheet L, a given subdivision or

partition of the glass (for example squares, rectangles, etc.). Each external partition grid 9 is configured so as to cover the profiles 1a, 1b of the internal partition grid P, to hide them from view from outside of the insulating glass.

**[0081]** For this reason, each external partition grid 9 reproduces exactly the shape of the internal partition grid P, that is, it exactly overlaps the latter.

**[0082]** Each external partition grid 9 can be made in a single piece, or it can be the result of the joining of several individual profiles, without particular limitations.

**[0083]** Also the cross-section of the individual elements of each external partition grid 9 can be any one, according to specific aesthetic/functional requirements.

**[0084]** As shown in Figure 7, the combination of the internal partition grid P and the external partition grids 9 determines a final aesthetic result that can be thoroughly assimilated to an insulating glass comprising a real English-style partition, in which, that is, single portions of glass sheets are assembled on a grid support structure.

**[0085]** As was said, however, in the present invention the internal partition grid P does not have a load bearing/structural function, but only an aesthetic one.

**[0086]** The aforementioned aesthetic result is satisfactory also by observing kit 1 from different angles, and also from close range, as better explained hereinafter.

**[0087]** In Figures 7,8 the kit 1 comprises profiles 1a,1b according to the embodiment shown in Figure 33, described hereinafter, only for illustrative and non-limiting purposes.

**[0088]** Figure 9 shows a detailed side view of an embodiment of the kit 1 according to the invention, installed in an insulating glass.

**[0089]** The cross-section of each profile 1a, 1b comprises at least a first perimeter portion 10 and a second perimeter portion 11, opposite each other.

**[0090]** The first perimeter portion 10 and the second perimeter portion 11, respectively, define two opposite external side surfaces of the profile 1a, 1b.

**[0091]** More in detail, the first perimeter portion 10 and the second perimeter portion 11 define the external side surfaces of the profile 1a, 1b which, with the assembled glass, delimit the volume enclosed between the two glass sheets L (i.e. in other words they are turned to face the perimeter frame 2).

**[0092]** This means that, with the assembled kit 1, both the first perimeter portion 10 and the second portion 11 are visible from the outside.

**[0093]** For this reason, the first perimeter portion 10 and the second perimeter portion 11 can feature respective grooves 12, optionally with micro-holes which simulate those provided for in the perimeter frame 2 to contain dehydrating salts or molecular sieves, so as to ensure aesthetic continuity with the perimeter frame 2 itself.

**[0094]** Moreover, the first perimeter portion 10 and the second perimeter portion 11 are flat or substantially flat (and therefore, flat-parallel).

**[0095]** The first perimeter portion 10 and the second

perimeter portion 11 are orthogonal with respect to the planes of the glass sheets L.

**[0096]** Additionally, the profile 1a, 1b comprises a third perimeter portion 13 and a fourth perimeter portion 14, opposite each other.

**[0097]** The third perimeter portion 13 and the fourth perimeter portion 14 connect the first perimeter portion 10 to the second perimeter portion 11, so as to define a closed section.

**[0098]** The section of the profile 1a, 1b, therefore, in this case has a rectangular or square shape.

**[0099]** Indeed, the third perimeter portion 13 and the fourth perimeter portion 14 may have any shape - in cross section - since they are not intended to adhere to the respective internal surfaces of the glass sheets L.

**[0100]** In fact, it is provided that between the glass sheets L and the internal partition grid P there is a given distance, for example at least 2 mm, to allow the internal volume of the glass to be filled with the insulating gas.

**[0101]** The section of the profile 1a, 1b further comprises at least one middle portion 15, comprised between at least two opposed perimeter portions 10,11,13,14.

**[0102]** The middle portion 15 is connected to at least one of the perimeter portions 10,11,13,14.

**[0103]** More in detail, in this embodiment the middle portion 15 is connected to at least one between the first perimeter portion 10 and the second perimeter portion 11. Even more in particular, the middle portion 15 is connected both to the first perimeter portion 10 and to the second perimeter portion 11.

**[0104]** In the embodiment of Figure 9, therefore, the middle portion 15 is enclosed within the closed section defined by the four perimeter portions 10,11,13,14.

**[0105]** According to one aspect of the invention, the middle portion 15 comprises at least one seat 16.

**[0106]** The seat 16 is suitable for housing a universal connecting element 6, or a portion of a universal connecting element 6 (shown schematically with broken lines).

**[0107]** The seat 16 also has a suitable shaping for housing screws, rivets or other elements for fixing the partition grid P to the support structure S.

**[0108]** The seat 16 may have any shape and/or dimensions.

**[0109]** In the embodiment of the invention of Figure 9, the seat 16 has a circular or substantially circular shape, open at two diametrically opposed portions.

**[0110]** More in detail, the middle portion 15 comprises two opposed structures 15a, 15b and concurrent, substantially hollow triangular, which extend respectively from the first perimeter portion 10 and from the second perimeter portion 11, and which end - at their respective vertices - with a centre area 15c wherein the seat 16 is provided.

**[0111]** The centre area 15c is shaped so as to create a volume of material sufficient to allow for the fixing of the profile 1a, 1b, through fixing means 8 such as clips or ratchet nails, directly to the perimeter frame 2 without

using other components (e.g. end pieces).

**[0112]** More in detail, the centre area 15c is shaped so as to create a volume of material sufficient for the aforementioned fixing means 8 (for example clips or ratchet nails) to engage in/grasp the material, partially penetrating it by passing through the support structure.

**[0113]** In the same way, also the opposed structures 15a, 15b can be shaped so as to create a volume of material sufficient to allow for the fixing of the profile 1a, 1b, through fixing means 8 such as clips or ratchet nails, directly to the perimeter frame 2 (engaging in, grasping or penetrating the material). More particularly, the centre area 15c comprises two appendages 15d, 15e, which in turn form two opposed portions of the aforementioned seat 16.

**[0114]** The opposed structures 15a, 15b may be mirror-like, but not necessarily so.

**[0115]** The seat 16 could also have a circular, or substantially circular, closed shaping.

**[0116]** Within the two opposed structures 15a, 15b - i.e. inside the respective triangular cavities - small grooves 17 or slots may be provided; such grooves 17 or slots (or notches) have the function of facilitating the correct drilling of the first perimeter portion 10 or of the second perimeter portion 11 to create, for example, a blind drilling 7 for insertion of a universal connecting element 6 (so as to constitute a preferred stop/lock zone for the drill bit).

**[0117]** The middle portion 15 is therefore made of a single piece of plastic material at least with the first perimeter portion 10 and the second perimeter portion 11 (and also, in this case, with the third perimeter portion 13 and the fourth perimeter portion 14). In the light of what has been described, it is easy to understand how to assemble the internal partition grid P of the kit 1 according to the embodiments of Figures 4,5,6, wherein the connecting element 6 is inserted in the seat 16 of the first profile 1a and in the through - or blind - drilling 7 of the second profile 1b.

**[0118]** In the embodiments shown in Figures 4,5,6, the fixing means 8 comprise, for example, for each end of the profiles 1a, 1b, a clip passing through the rectilinear elements 3,4 of the perimeter frame 2, which engages in/grasps the middle portion 15 of the profile 1a, 1b.

**[0119]** However, other types of fixing means 8 suitable for engaging in/grasping the middle portion 15 of the profile 1a, 1b may be provided.

**[0120]** Each profile 1a, 1b can have various other configurations, specifically implemented to satisfy specific functional, production, aesthetic, assembly or other requirements. It is important to note that the first perimeter portion 10 and the second perimeter portion 11, flat and opposed, allow, as can be observed in particular in Figure 8, perfectly matching and aesthetically clean crossing zones to be obtained.

**[0121]** In fact, for example, the flat base surface of the first profile 1a rests perfectly against the first, or second perimeter portion 10, 11 of the second profile 1b, and the

whole assembly is then bound by the universal connecting element 6.

**[0122]** No further processing is necessary to obtain perfectly matching parts, as is the case for known type partition profiles.

**[0123]** As mentioned, the combination of such crossing zone with two external partition grids 9 produces an aesthetic result very similar to that observed in an insulating glass provided with a real English-style partition, but with costs and production/assembly times considerably lower.

**[0124]** In the embodiment of the kit 1 shown in Figure 10, the profile 1a, 1b comprises a first perimeter portion 10 and a second perimeter portion 11, having the characteristics described with reference to the embodiment of Figure 9; the profile 1a, 1b does not, however, comprise a third perimeter portion 13 and a fourth perimeter portion 14, as in the previous case (the third perimeter portion 13 and the fourth perimeter portion 14 are, therefore, optional, it being possible to omit them for given functional requirements, as clarified below).

**[0125]** Unlike the existing rectangular profiles, the shaping of the profile 1a, 1b illustrated in Figure 10 allows such portions 13, 14 to be eliminated, since in the final assembly they are completely covered by the external partition grid 9.

**[0126]** In this embodiment, the first perimeter portion 10 and the second perimeter portion 11 therefore comprise respective end pieces 10a, 11a.

**[0127]** The presence of the end pieces 10a, 11a of the perimeter portions 10, 11 may allow the aesthetic result deriving from the superimposition of the external partition grid 9 to the internal partition grid P to be optimised, so as to be as close as possible to the appearance of a genuine English style glass wall.

**[0128]** In this embodiment, the centre area 15c (and in particular the opposed structures 15a, 15b) of the middle portion 15 are wider than the embodiment of Figure 9, and have more circumscribed respective cavities, so as to create a larger volume for the engagement/grasping/penetration of the fixing means 8, which therefore becomes even easier and steadier.

**[0129]** The seat 16 has a circular, or substantially circular, closed shape, as the third perimeter portion 13 and the fourth perimeter portion 14 are absent, as was said. Also, in this case the middle portion 15 is made of a single piece of plastic material with the first perimeter portion 10 and the second perimeter portion 11.

**[0130]** Moreover, the centre area 15c comprises an annular portion 18 of circular, or substantially circular, closed shape, wherein the seat 16 is provided.

**[0131]** Figure 11 illustrates another embodiment of the kit 1 according to the invention; in particular, a different profile 1a, 1b of the internal partition grid P is shown.

**[0132]** The embodiment of Figure 11 differs from the embodiment of Figure 10 in that the cross section of the profile 1a, 1b also comprises a third perimeter portion 13 and a fourth perimeter portion 14 which connect the first

perimeter portion 10 to the second perimeter portion 11 (thus obtaining a closed section as in the embodiment of Figure 9).

**[0133]** A more rigid and stronger profile 1a, 1b is therefore obtained.

**[0134]** Figure 12 illustrates another embodiment of the kit 1 according to the invention; in particular, a different profile 1a, 1b of the internal partition grid P is shown.

**[0135]** In this embodiment, the cross section of the profile 1a, 1b comprises four perimeter portions 10, 11, 13, 14 which define a closed section (either square or rectangular). Moreover, unlike the previous embodiments, the middle portion 15 - contained within the aforesaid closed section - is connected to the third perimeter portion 13 and to the fourth perimeter portion 14.

**[0136]** The two opposed structures 15a, 15b, which extend from the third perimeter portion 13 and from the fourth perimeter portion 14, are constituted in this case by simple aligned rectilinear sections.

**[0137]** The centre area 15c comprises an annular portion 18 of circular, or substantially circular, closed shape, wherein the seat 16 is provided.

**[0138]** The centre area 15c further comprises two opposed extensions 19, which depart from the annular portion 18, which comprise the respective grooves 17 to facilitate the drilling of the profile 1a, 1b.

**[0139]** The extensions 19 are arranged at 90° with respect to the opposed structures 15a, 15b.

**[0140]** Also the extensions 19 of the centre area 15c, in addition to the opposed structures 15a, 15b, define respective volumes suitable for engaging/grasping/penetrating the fixing means 8 of the partition grid P to the perimeter frame 2.

**[0141]** Figure 13 illustrates another embodiment of the kit 1 according to the invention; in particular, a different profile 1a, 1b of the internal partition grid P is shown.

**[0142]** This embodiment differs from that of Figure 12 in that the seat 16 has a grooved circular configuration.

**[0143]** The annular portion 18 therefore comprises a plurality of circumferential raised parts 20 located on the inner surface of the seat 16.

**[0144]** Correspondingly, the universal connecting element 6 can have a cylindrical, grooved, knurled, with leads or cylindrical shape, (bi)conical, smooth with a diameter (taking into account, clearly, appropriate assembly tolerances) equal to the inside diameter defined by the circumferential raised parts.

**[0145]** This solution can be advantageous because, during the insertion of the universal connecting element 6 into the seat 16, the mechanical interference produces a drawing of the plastic, which in turn increases grip and therefore promotes better tightness.

**[0146]** The embodiment of the profile 1a, 1b of the kit 1 shown in Figure 14 differs from that of Figure 11 in that the seat 16 has a grooved circular shaping (exactly as in the embodiment of Figure 13).

**[0147]** Figure 15 illustrates another embodiment of the kit 1 according to the invention; in particular, a different

profile 1a, 1b of the internal partition grid P is shown.

**[0148]** In this embodiment, the profile section has a shaping similar to that of the embodiment of Figure 10, but however, it differs from it in a few details.

**[0149]** Firstly, the seat 16 has a quadrangular shaping (in this specific case it is square, but it could also be rectangular or rhomboidal, shaped like a parallelogram, etc.).

**[0150]** In this case, the opposed structures 15a, 15b of the middle portion 15 have an essentially trapezoidal shape, and they depart from the median area of the first perimeter portion 10 and second perimeter portion 11 - respectively.

**[0151]** The centre area 15c is very large, so as to create a considerable volume of engagement/grasping/penetration of the connecting means 8 of the internal partition grid P to the perimeter frame 2.

**[0152]** The ends 10a, 11a of the first perimeter portion 10 and of the second perimeter portion 11 are folded, so as to optimise the aesthetic result in combination with the superimposed outer partition grid 9.

**[0153]** In conjunction with the profile 1a, 1b of Figure 15, a universal connecting element 6 having a quadrangular section can be used, but also optionally with a circular section (having the diameter of the circle inscribed in the seat 16).

**[0154]** The solution of Figure 16 is similar in all respects to that of Figure 15, with a seat 16 of smaller dimensions and a slimmer middle portion 15.

**[0155]** The profile 1a, 1b of the kit according to the embodiment of Figure 17 is instead similar in all respects to that of Figure 10, and differs from it in that the seat 16 is quadrangular (square, rectangular, rhomboidal, etc.).

**[0156]** The centre area 15c of the middle portion 15 is therefore adapted to the quadrangular shape of the seat 16 (with lateral flat-parallel surfaces 21), with a large volume of engagement/grasping/penetration of the connecting means 8 of the internal partition grid P to the perimeter frame 2.

**[0157]** Figure 18 illustrates another embodiment of the kit 1 according to the invention; in particular, a different profile 1a, 1b of the internal partition grid P is shown.

**[0158]** In this embodiment, the profile 1a, 1b comprises four perimeter portions 10,11,13,14 which define a closed section (either square or rectangular).

**[0159]** The centre area 15c of the middle portion 15, contained within the closed section, has a substantially wide rectangular shaping, and comprises an also rectangular seat 16.

**[0160]** The opposed structures 15a,15b of the middle portion 15 are connected to the first perimeter portion 10 and to the second perimeter portion 11.

**[0161]** The opposed structures 15a, 15b are made up of simple aligned lines.

**[0162]** In this case, the shape of the seat 16 requires the use of a universal connecting element 6 having a rectangular section, or of several connecting elements 6 having, for example, a circular or square section.

**[0163]** The embodiment of Figure 19 differs from that of Figure 18 in that the middle portion 15 is connected to all four perimeter portions 10,11,13,14, with four opposite structures 15a, 15b, two by two in a mirror-like arrangement and substantially in a cross shape (at 90° one with respect to the other).

**[0164]** The centre area 15c of the middle portion 15, wherein the seat 16 is provided, can therefore comprise lightening portions 22 at the corners, but defines, however, a sufficiently large volume of engagement/grasping/penetration of the connecting means 8 of the internal partition grid P to the perimeter frame 2.

**[0165]** With respect to the solution of Figure 18, the profile of Figure 19 is more rigid and stronger.

**[0166]** The profile 1a, 1b of the kit 1 according to the embodiment of Figure 20 is similar in all respects to that of Figure 11, and differs in that the seat 16 is constituted by a curvilinear segment (in this specific case, this segment comprises three consecutive curves so as to define a sort of "ω").

**[0167]** The segment could have any curvature, in relation to specific assembly needs. Correspondingly, the universal connecting element 6 must have a section identical to that of the seat 16 (or identical to at least one portion thereof), without assembly tolerances.

**[0168]** Figure 21 illustrates another embodiment of the kit 1 according to the invention; in particular, a different profile 1a, 1b of the internal partition grid P is shown.

**[0169]** The main feature of this embodiment consists in that at least one of the perimeter portions 10,11,13,14 of the section of the profile 1a,1b is connected to the middle portion 15 in a removable way.

**[0170]** More in detail, the profile 1a,1b comprises removable connecting means 23 provided between the middle portion 15 and at least one of the perimeter portions 10,11,13,14 (in this specific case, two opposed perimeter portions 10,11,13,14 i.e. the first portion 10 and the second portion 11).

**[0171]** In this way, as shown schematically in Figure 22, one same middle portion 15 can be coupled to different perimeter portions 10,11 (for example, of different sizes, of different material, of different colours, etc.).

**[0172]** This allows a large number of different solutions to be achieved by using one same middle portion 15 (and therefore one same connecting element 6), with considerable savings, for example, of design costs and warehousing costs.

**[0173]** The removable connecting means 23 comprise at least one recess 24 provided in the middle portion 15, and at least one rib 25, provided in one of the perimeter portions 10,11,13,14, suitable for engaging in a removable manner in the recess 24; more in detail, a sliding coupling is provided between the rib 25 and the recess 24. More in detail, the middle portion 15 comprises (at the two opposed structures 15a,15c) two recesses 24, wherein the ribs 25 of two opposite perimeter portions 10,11,13,14 are engaged.

**[0174]** For example, the recess 24 and the rib 25 may

be substantially dovetail shaped, or they may have other shapes suitable for obtaining a solid and secure coupling.

**[0175]** The embodiment of Figure 23 differs from that of Figure 21 in that the recesses 24 and the respective ribs 25 are shaped like a circular segment, such as to create, in the mutual coupling, an undercut that prevents disengagement.

**[0176]** The shaping as a circular segment (or as a hammer, hook, or others) allows for pressure coupling between ribs 25 and recesses 24, while in the previous case (with dovetail shaping), coupling is by insertion.

**[0177]** Therefore, one can choose one or the other solution, for example, in relation to specific assembly needs, or others.

**[0178]** Like in Figure 22, also in Figure 24 possible couplings of a same middle portion 15 are schematically shown with perimeter portions 10,11,13,14 of different sizes, materials, colours, etc.

**[0179]** Other embodiments of kit 1 according to the invention are shown in Figures 25-33. In particular, Figure 25 shows an embodiment of the profile 1a,1b of the kit 1 wherein the middle portion 15 has a rectangular or substantially rectangular section, with flat or substantially flat side surfaces 21.

**[0180]** Figure 26 shows a detail of the same kit 1 installed in the insulating glass. Therefore, the profile 1a,1b has, overall, a substantially H-shaped cross section.

**[0181]** In the centre of the middle portion 15 a seat 16 is provided for housing a universal connecting element 6.

**[0182]** The seat 16 is circular, or substantially circular, closed, but could be of another shape.

**[0183]** In this embodiment, the middle portion 15 has a minimum footprint, and does not include other cavities that could contain air.

**[0184]** The embodiment of Figures 27,28 differs from that of Figures 25,26 in that the seat 16 has a circular, or substantially circular, open shape; in other words, along one of the side surfaces 21 a groove 26 is provided which communicates with the seat 16. The groove 26 can facilitate the engagement of the universal connecting element 6, due to the elastic yield of the middle portion 15.

**[0185]** The embodiment of Figures 29,30 differs from that of Figures 25,26 in that the middle portion 15 comprises two ends of smaller width 27,28, for connection to the first perimeter portion 10 and to the second perimeter portion 11.

**[0186]** The middle portion 15 consequently has a smaller footprint, and therefore a greater volume is available for filling the glass with gas.

**[0187]** The embodiment of Figures 31,32 is further differentiated in that the seat 16 has a square or rectangular shape.

**[0188]** Furthermore, each of the smaller-width ends 27,28 comprises two bridges which define a respective cavity 29 between each other.

**[0189]** Each of the cavities 29 can be used for the engagement of a universal connecting element 6, or for the engagement of a portion of the universal connecting el-

ement 6.

**[0190]** The embodiment of Figure 33, instead, with respect to that of Figures 31,32, has a middle portion 15 which is slimmer and has a smaller width, only becoming wider at the seat 16.

**[0191]** Figure 34 shows, in detail, an insulating glass with kit 1 according to the embodiment of Figure 33, during the filling of the glass itself with the insulating gas.

**[0192]** The continuous lines F which surround the profile 1a,1b schematically represent the flow of the insulating gas during the filling, which normally always takes place starting from one end of the glass.

**[0193]** As can be observed, the special "H" shape of the profile 1a,1b determines the emergence of turbulence zones T around the middle portion 15, which help better filling of the internal volume of the glass sheets L also at the profile 1a,1b itself. Figure 35 shows the profile 1a,1b of the kit 1 according to another possible embodiment of the invention.

**[0194]** According to this embodiment, the profile 1a,1b has a substantially closed rectangular section, similar, for example, to that of the embodiment of Figure 9 in its general shaping.

**[0195]** In this case, however, the middle portion 15 is rectangular in shape and it encloses a square or rectangular seat 16.

**[0196]** Moreover, the middle portion 15 comprises two opposed protrusions 31,32 which, if necessary, can effectively increase the surface of the middle portion 15, thus favouring better penetration of the fixing means 8.

**[0197]** Other embodiments of kit 1 according to the invention are shown in Figures 36-59. In such embodiments, the internal partition grid P comprises profiles 1a,1b having the shape shown in Figure 33, or a shaping similar to it.

**[0198]** Furthermore, in such embodiments the internal partition grid P comprises two first profiles 1a and two second profiles 1b, arranged in a cross pattern.

**[0199]** They are mutually joined by a universal connecting element 6 which can assume various shapes.

**[0200]** In the embodiment of Figures 36,37, kit 1 comprises the universal connecting element 6 shown in Figures 46,47.

**[0201]** In this case, the universal connecting element 6 consists of a cross (e.g. made of metal or plastic) wherein the individual branches 6a have a knurled or in any case not smooth surface, to increase the friction inside the seats 16 of the profiles 1a, 1b; in the cross section of Figure 48, the universal connecting element 6 is shown engaged in the seat 16 of one of the profiles 1a,1b.

**[0202]** In the embodiment of Figures 38,39, kit 1 comprises the universal connecting element 6 of Figures 49,50.

**[0203]** In this case, the universal connecting element 6 comprises a centre portion 33, either square or rectangular; from each of the sides of the centre portion 33 two parallel appendages 34 branch off.

**[0204]** As shown in the cross section of Figure 51, the

parallel appendages 34 of the universal connecting element 6 are suitable for being inserted into the cavities 29 of the respective profiles 1a,1b.

**[0205]** This solution is particularly effective in preventing the profiles 1a,1b from rotating in an assembled configuration of the internal partition grid P.

**[0206]** In the embodiment of Figures 40,41, kit 1 comprises the universal connecting element 6 of Figures 52,53.

**[0207]** In this case, the universal connecting element 6 comprises a centre portion 33, either square or rectangular; from each of the sides of the centre portion 33 two pairs of parallel appendages 34 branch off.

**[0208]** The parallel appendages 34 of each pair are appropriately spaced one from the other, so that the middle portion of each profile 1a,1b can engage between them, as shown in the cross section of Figure 54.

**[0209]** In the embodiment of Figures 42,43, kit 1 comprises the universal connecting element 6 of Figures 55,56.

**[0210]** In this case, the universal connecting element 6 is substantially shaped as a four-lobed cross.

**[0211]** More in detail, each branch of the cross comprises two pairs of lobes 6b that are hollow, so as to be elastically flexible.

**[0212]** The lobes 6b of each pair are appropriately spaced one from the other, so that the middle portion of each profile 1a,1b can engage between them, as shown in the cross section of Figure 57.

**[0213]** In the embodiment of Figures 44,45, kit 1 comprises the universal connecting element 6 of Figures 58,59.

**[0214]** In this case, the universal connecting element 6 comprises a first plate element 6c and a second plate element 6d, which can be mutually coupled.

**[0215]** The first plate element 6c (substantially shaped like a cross) can comprise pins which are suitable for engaging in respective holes of the second plate element 6d, so as to clamp between them the middle portion 15 of each profile 1a,1b.

**[0216]** The universal connecting element 6 can be made of any material with suitable characteristics for the application.

**[0217]** For example, the connecting element 6 can be made of metal material.

**[0218]** The universal connecting element 6 could consist of a cylindrical pin, or a tapered pin, or a section bar complementary to that of the seat 16, or of the cavity 29.

**[0219]** As shown, for example, in the embodiment of Figure 45, the profiles 1a,1b could be assembled so as not to be in complete direct contact, and therefore leaving, at the centre of the crossing point of the internal partition grid P, an empty/open area. Thanks to the characteristics of the invention, this does not constitute an impediment, since the external partition grid 9 is able to completely hide this crossing zone from view, and the overall appearance of the kit will in any case be the desired one.

**[0220]** Therefore, in the connecting zone between the profiles 1a, 1b, connecting elements 6 of any type can be used, without limitation, since, when the kit 1 is completely assembled, they will be perfectly hidden.

**[0221]** It has thus been seen how the invention achieves the intended purposes.

**[0222]** The proposed solution eliminates the need to use fixing accessories specifically designed and manufactured for a specific type of profile.

**[0223]** In fact, profiles 1a,1b of any type, made with the characteristics of the present invention, can be connected to each other, to produce partition grids, using a single type of connecting elements 6, or a limited number of connecting elements 6, independent of the shape and dimensions of the section of profile 1a, 1b.

**[0224]** Design costs, storage costs, and other costs resulting from the need to use different assembly kits for different profiles are dramatically reduced.

**[0225]** More in detail, it is no longer necessary to use a central junction kit of the type currently used, thanks to the possibility of connecting the profiles 1a,1b to each other with a single type of universal connecting element 6; moreover, it is no longer necessary to use terminals for connecting the internal partition grid P to the perimeter frame 2 of the support structure S of the insulating glass, thanks to the fact that the shaping of the profiles 1a,1b (in particular, the shaping of the middle portion 15) allows the profiles 1a,1b to be connected directly to the perimeter frame 2 by means of fastening means 8 that are very simple and inexpensive such as clips, pin nails, screws, rivets, or the like.

**[0226]** The proposed solutions also make it possible to considerably expand the range of products that can be produced (including, but not limited to, in terms of colour), since there are no more chromatic constraints linked to the use of certain assembly accessories (e.g. crosses and end pieces with buffers).

**[0227]** The costs and production times are also considerably reduced, since assembling of the partition grids and of the perimeter frames is now much quicker and more immediate.

**[0228]** In the embodiments of the invention wherein the profiles 1a,1b have an open section at at least two sides (and therefore not rectangular or square) the amount of trapped air is greatly reduced, improving the performance of the glass from the point of view of thermal insulation.

**[0229]** Moreover, the same open section allows to increase, compared to the known solutions, the volume of the insulating glass filled with suitable gas.

**[0230]** Individual characteristics of the invention described in relation to specific embodiments, where possible, may be interchanged with other characteristics present in other embodiments.

**[0231]** The present invention has been described according to preferred embodiments, but equivalent variants are still possible without departing from the scope of the appended claims.

## Claims

1. A kit (1) for making a partition in an insulating glass, said glass being provided with a perimeter frame (2) and at least two glass sheets (L), comprising at least one internal partition grid (P), which can be fixed to said perimeter frame (2) by fixing means (8), comprising a plurality of profiles (1a,1b) which can be variously combined and mutually connected, by means of a single universal connecting element (6), regardless of the dimensions and finish of the profiles (1a,1b), to create one or more crossing zones inside the volume enclosed by said glass sheets (L), **characterised in that** it also comprises at least two external partition grids (9), which can be fixed to the outer surfaces of the respective glass sheets (L) of the insulating glass, configured so as to cover said internal partition grid (P) exactly superimposed to the latter, **and in that** each one of said profiles (1a,1b) comprises at least one first perimeter portion (10) and at least one second perimeter portion (11), opposed, flat or substantially flat, arranged orthogonally to the planes of the glass sheets (L), said external partition grids (9) being suitable for completely covering said profiles (1a,1b) with the exception of said first perimeter portions (10) and second perimeter portions (11).
2. A kit according to claim 1, wherein in said crossing zones of said profiles (1a,1b) the flat base surface of said first profile (1a), or of said second profile (1b), rests perfectly against the first, or second, perimeter portion (10,11) of said second profile (1b), or first profile (1a), so as to obtain crossing zones that are perfectly matching.
3. A kit according to claim 2, wherein each of said profiles comprises at least one middle portion (15), connected to said first perimeter portion (10) and second perimeter portion (11), comprising a centre area (15c) designed to create a volume of material sufficient to allow the connection of said profile (1a,1b), through fixing means (8), directly to said perimeter frame (2).
4. A kit according to claim 3, wherein said middle portion (15) comprises at least one seat (16) wherein at least one portion of said universal connecting element (6) can be housed.
5. A kit according to claim 4, wherein said middle portion (15) comprises two concurrent opposed structures (15a,15b), which are respectively extended from said first perimeter portion (10) and second perimeter portion (11) and which end with said centre area (15c) wherein said seat is provided (16).
6. A kit according to claim 5, wherein said opposed structures (15a,15b) are intended to create a volume of material sufficient to allow the connection of said profile (1a,1b), through fixing means (8), directly to said perimeter frame (2).
7. A kit according to one of claims 3-6, wherein each of said profiles (1a,1b) comprises four perimeter portions (10,11,13,14) mutually connected, so as to define a closed section, said middle portion (15) being contained within said closed section.
8. A kit according to one of the claims 4-7, wherein said seat (16) is either closed or open.
9. A kit according to one of the claims 4-8, wherein said seat (16) has a circular or substantially circular, or quadrangular, or grooved shape, or is shaped as a curvilinear line.
10. A kit according to one of the claims 3-9, wherein at least said first, second perimeter portions (10,11) and said middle portion (15) are made of a single piece of plastic material.
11. A kit according to one of claims 3 - 10, wherein said middle portion (15) comprises two ends of smaller width (27,28) connecting to said first perimeter portion (10) and to said second perimeter portion (11), wherein each of said ends of smaller width (27, 28) comprises two bridges which define between them a respective cavity (29), usable for the engagement of said universal connecting element (6), or of a portion of said universal connecting element (6).
12. A kit according to one of claims 3 - 11, wherein said profile (1a,1b) comprises removable connecting means (23) provided between said middle portion (15) and said first, second perimeter portion (10,11), said removable connecting means (23) comprising at least one recess (24) provided in said middle portion (15) and at least one rib (25), provided in at least one of said first, second perimeter portions (10,11), suitable for engaging in a removable way in said recess (24).
13. A kit according to one of claims 4-12, wherein said universal connecting element (6) consists of a cylindrical pin, or a tapered pin, or a bar with a cross section complementary to that of said seat (16).
14. A kit according to one of claims 4-12, wherein said universal connecting element (6) is substantially cross-shaped, wherein the individual branches (6a) have a knurled or in any case not smooth surface, to increase the friction inside said seats (16) of said profiles (1a, 1b).
15. A kit according to one of claims 11-12, wherein said

universal connecting element (6) comprises a centre portion (33) having four sides, and wherein from each of said sides two parallel appendages (34) branch off to fit into said cavity (29) of said profiles (1a, 1b).

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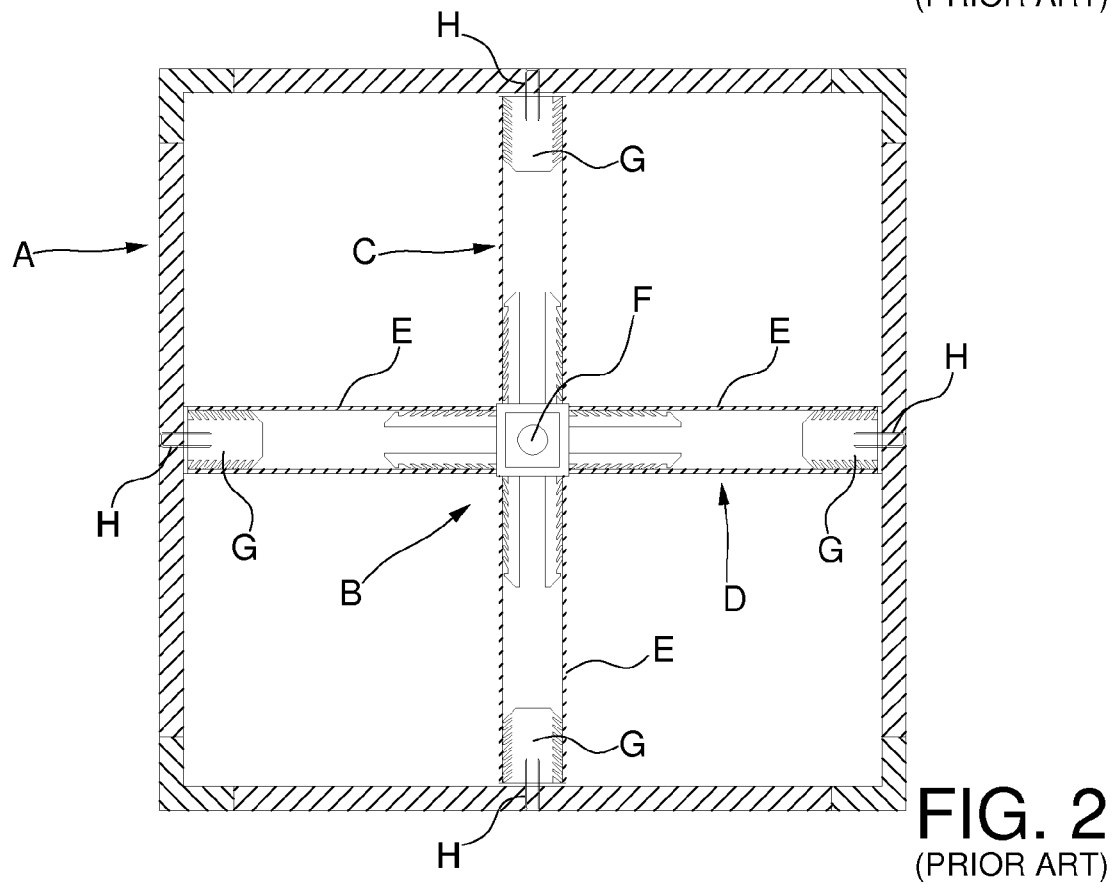
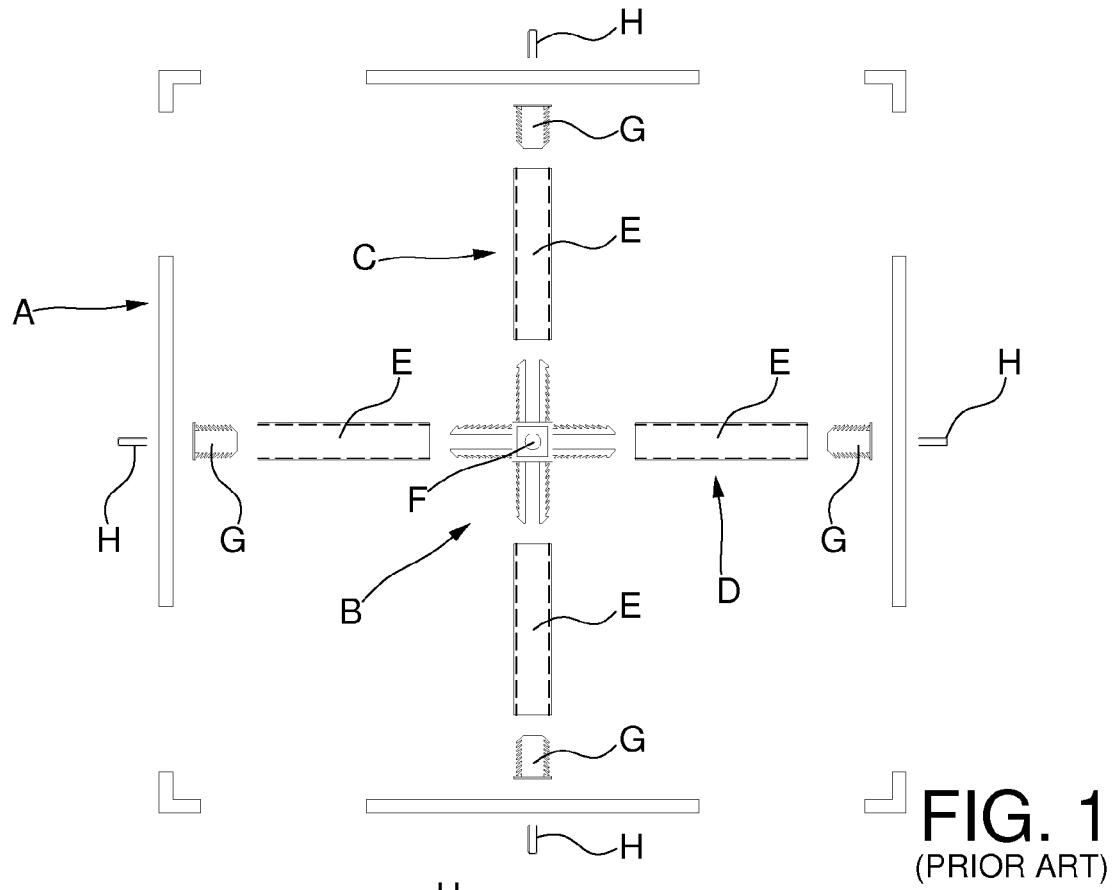
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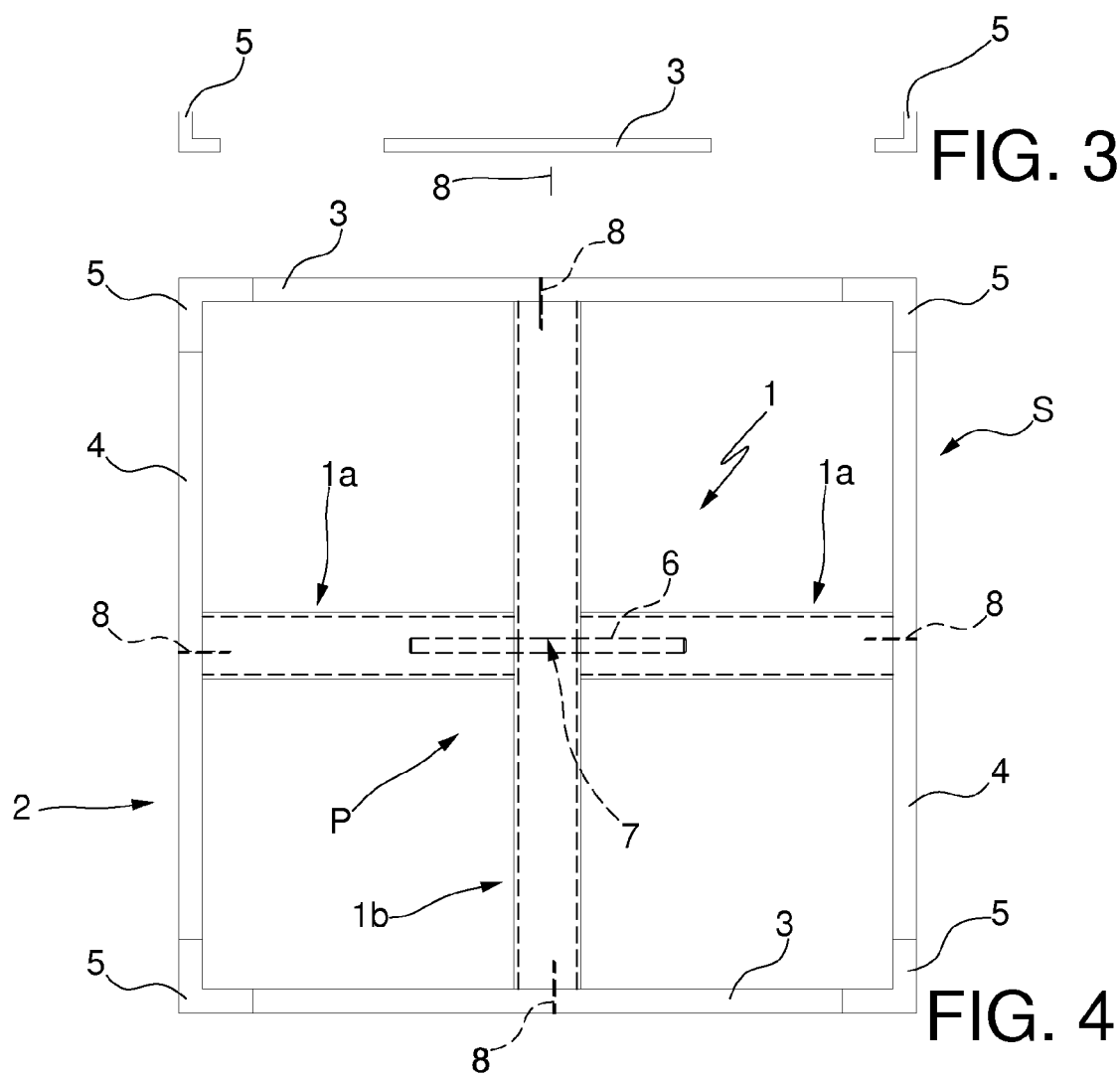
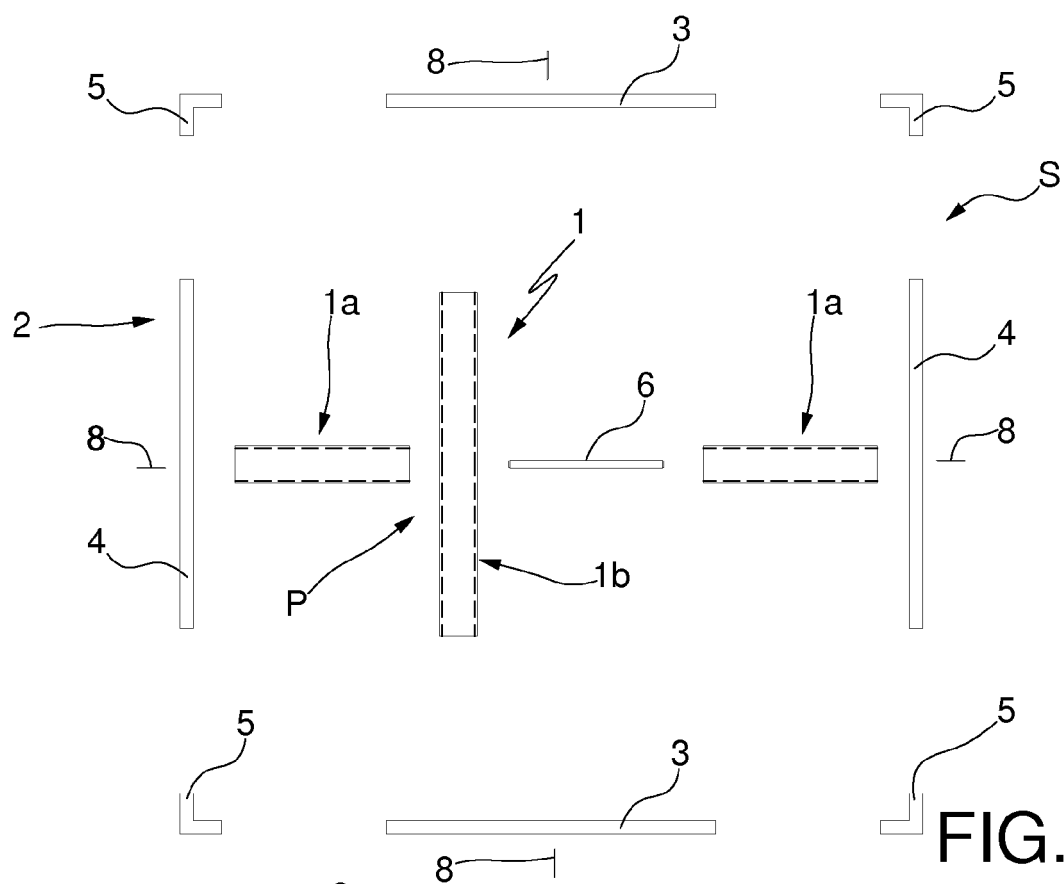
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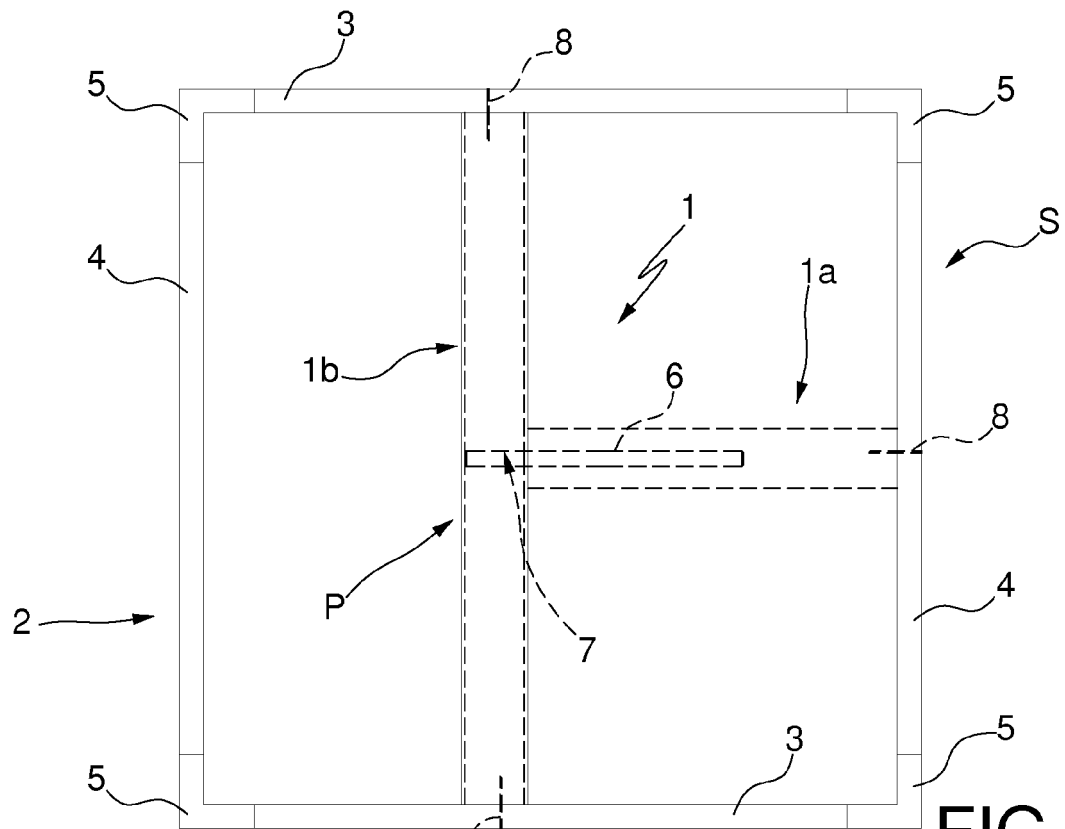


FIG. 5

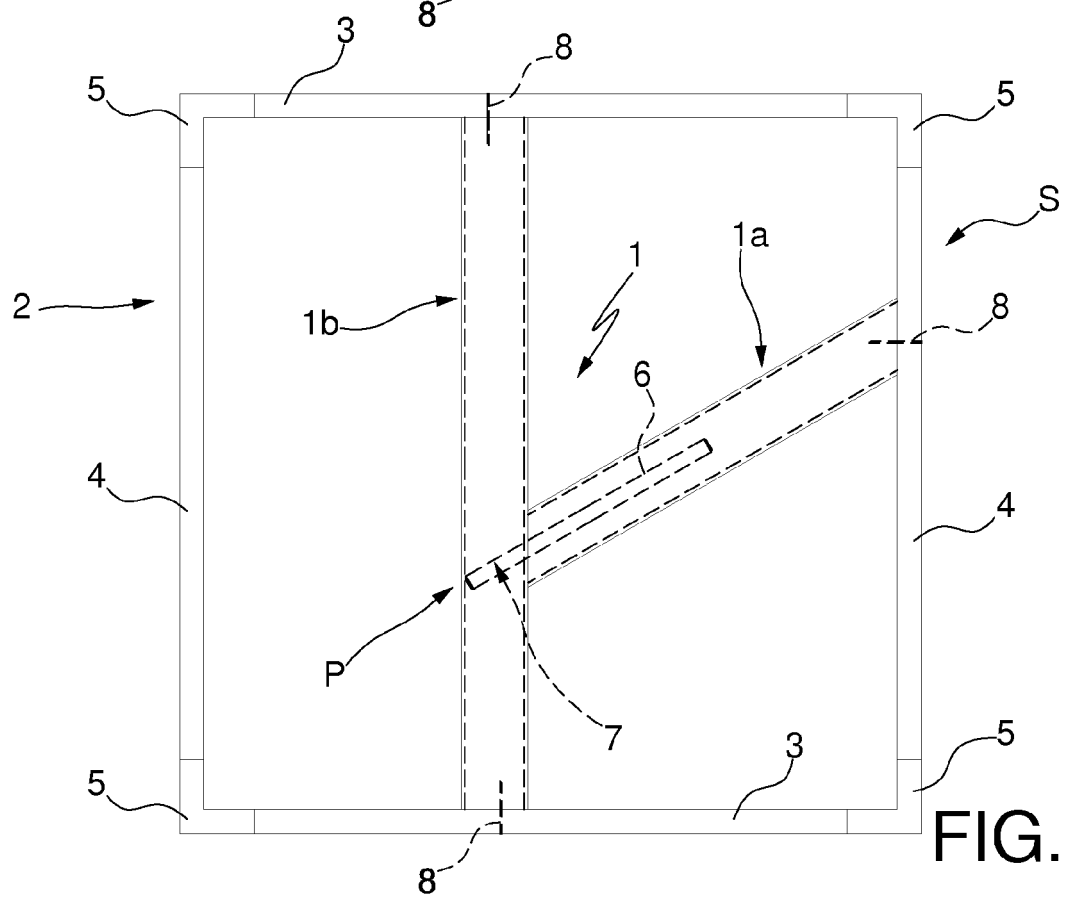


FIG. 6

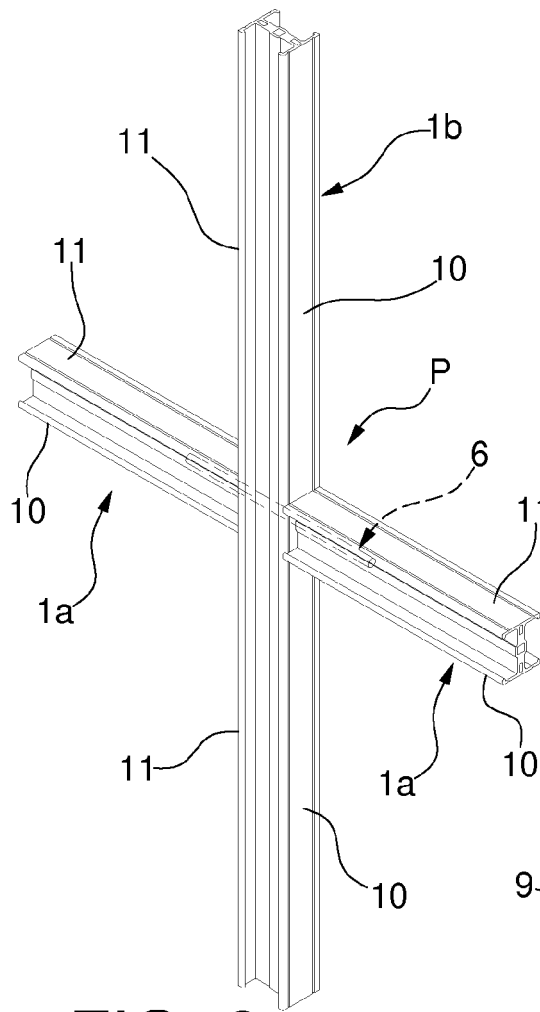


FIG. 8

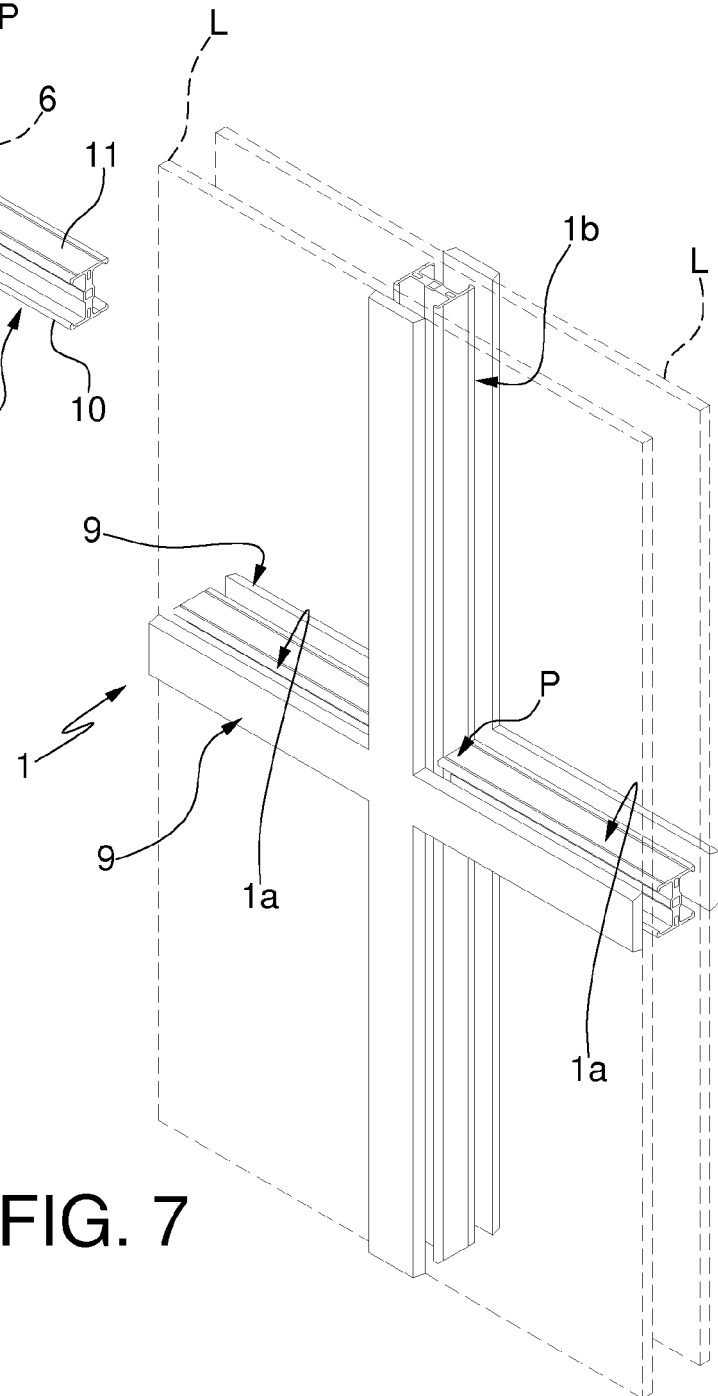


FIG. 7

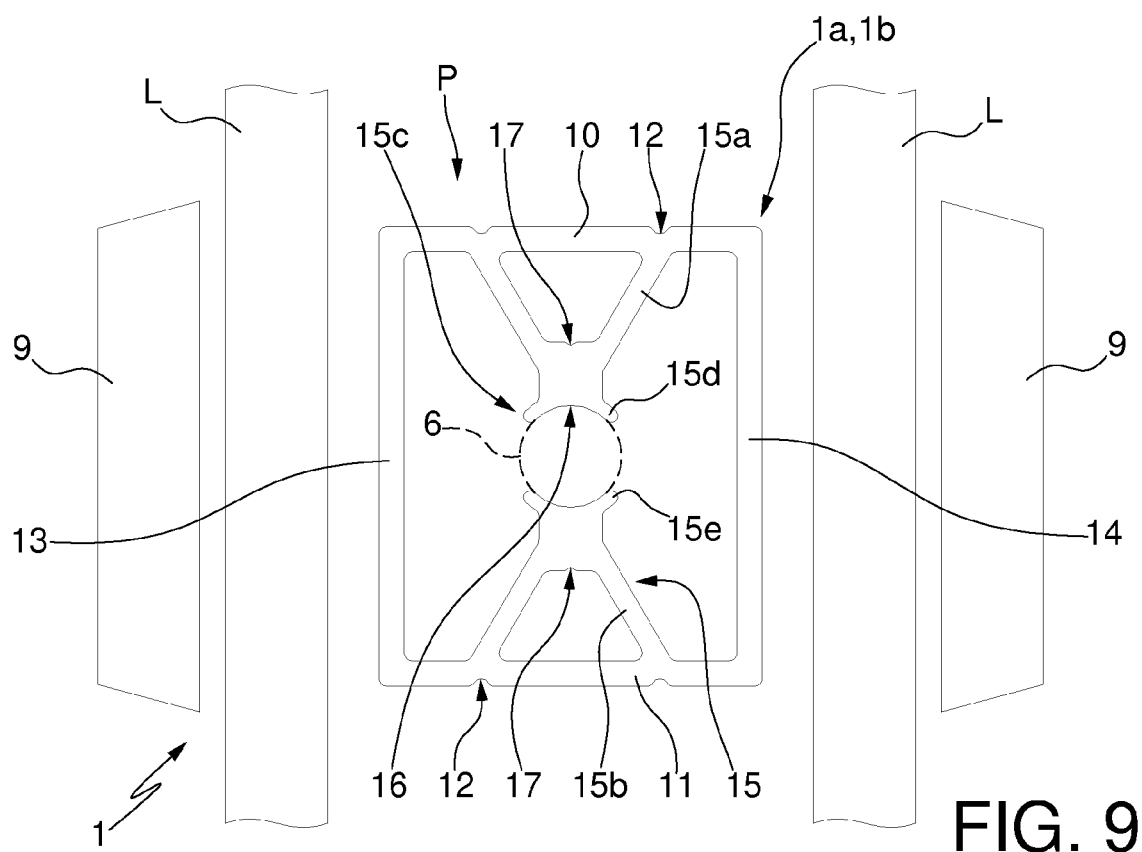


FIG. 9

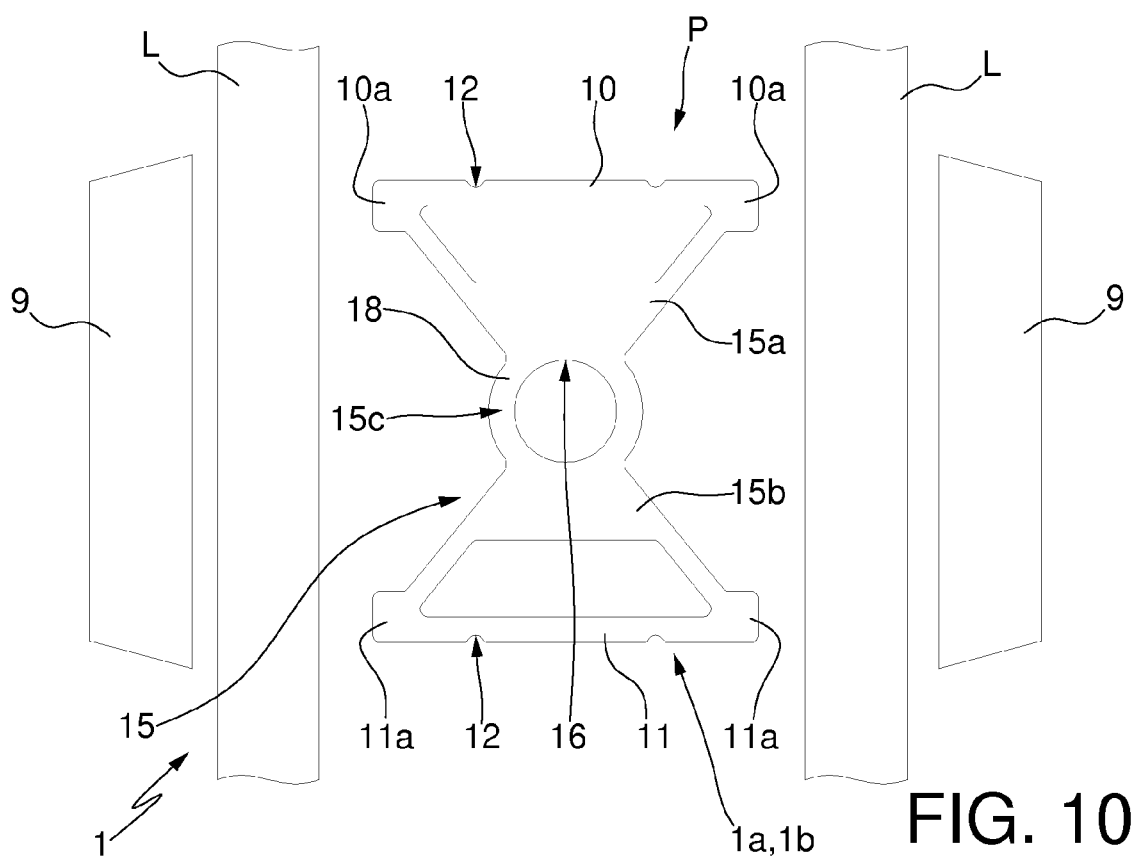


FIG. 10

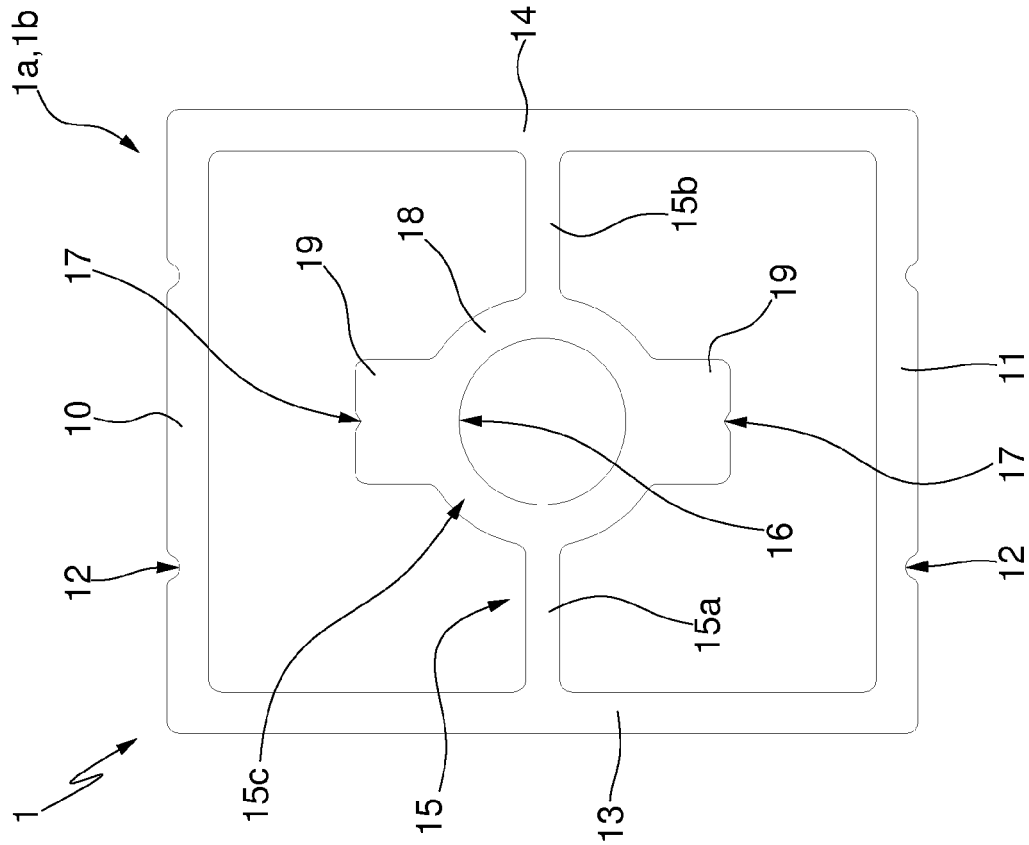


FIG. 12

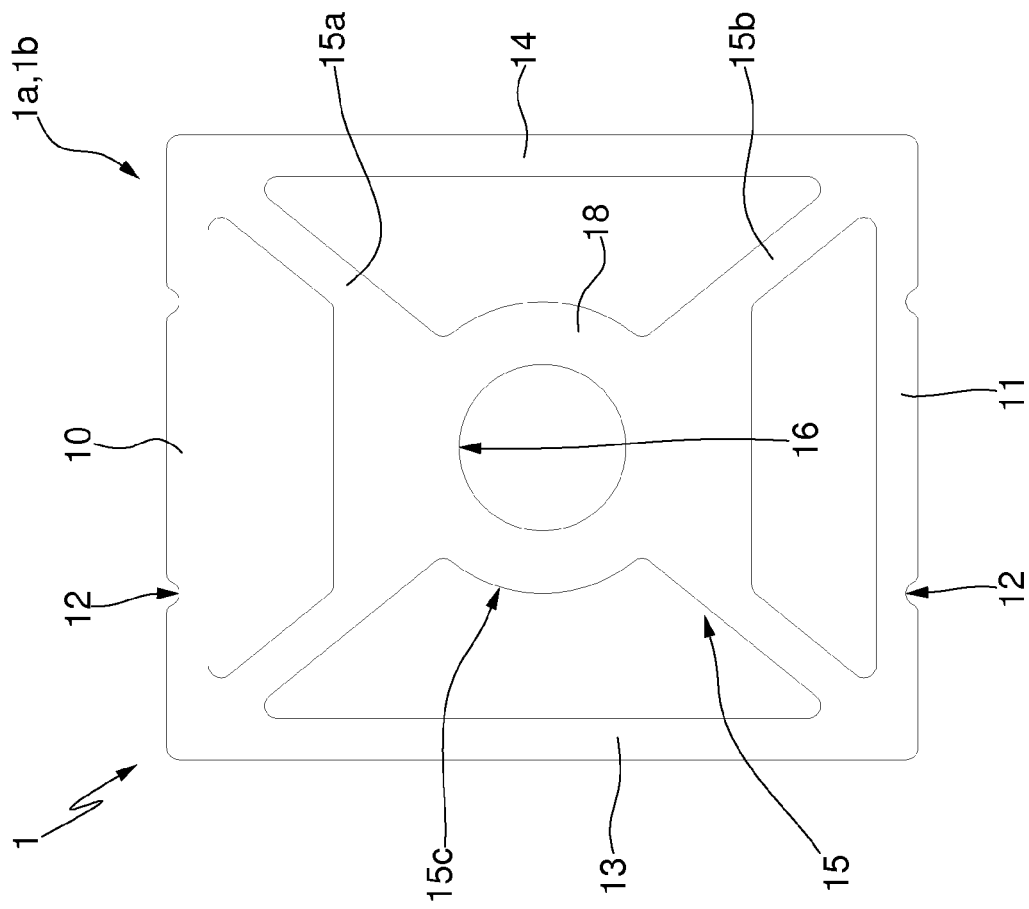


FIG. 11

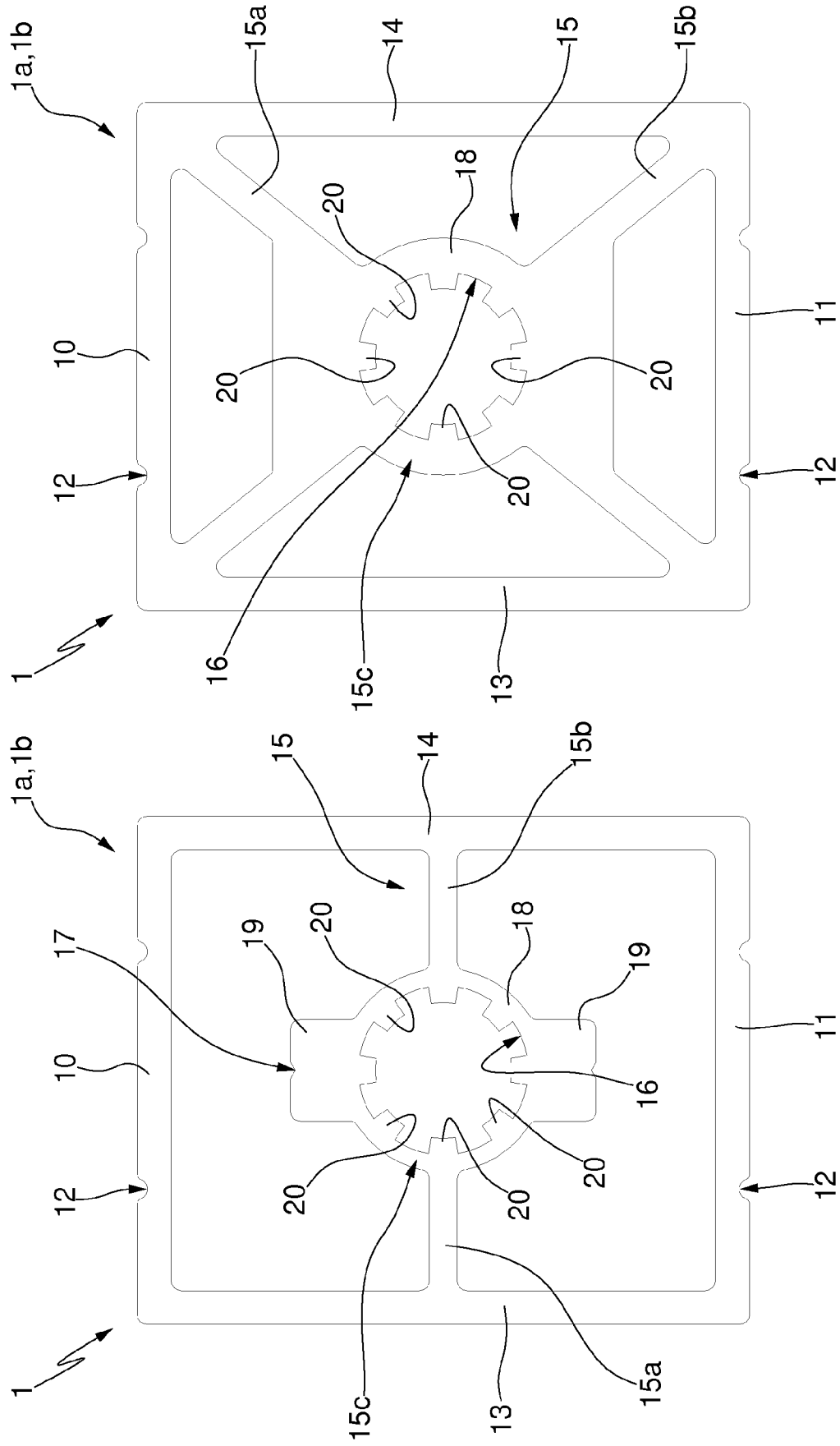


FIG. 14

FIG. 13

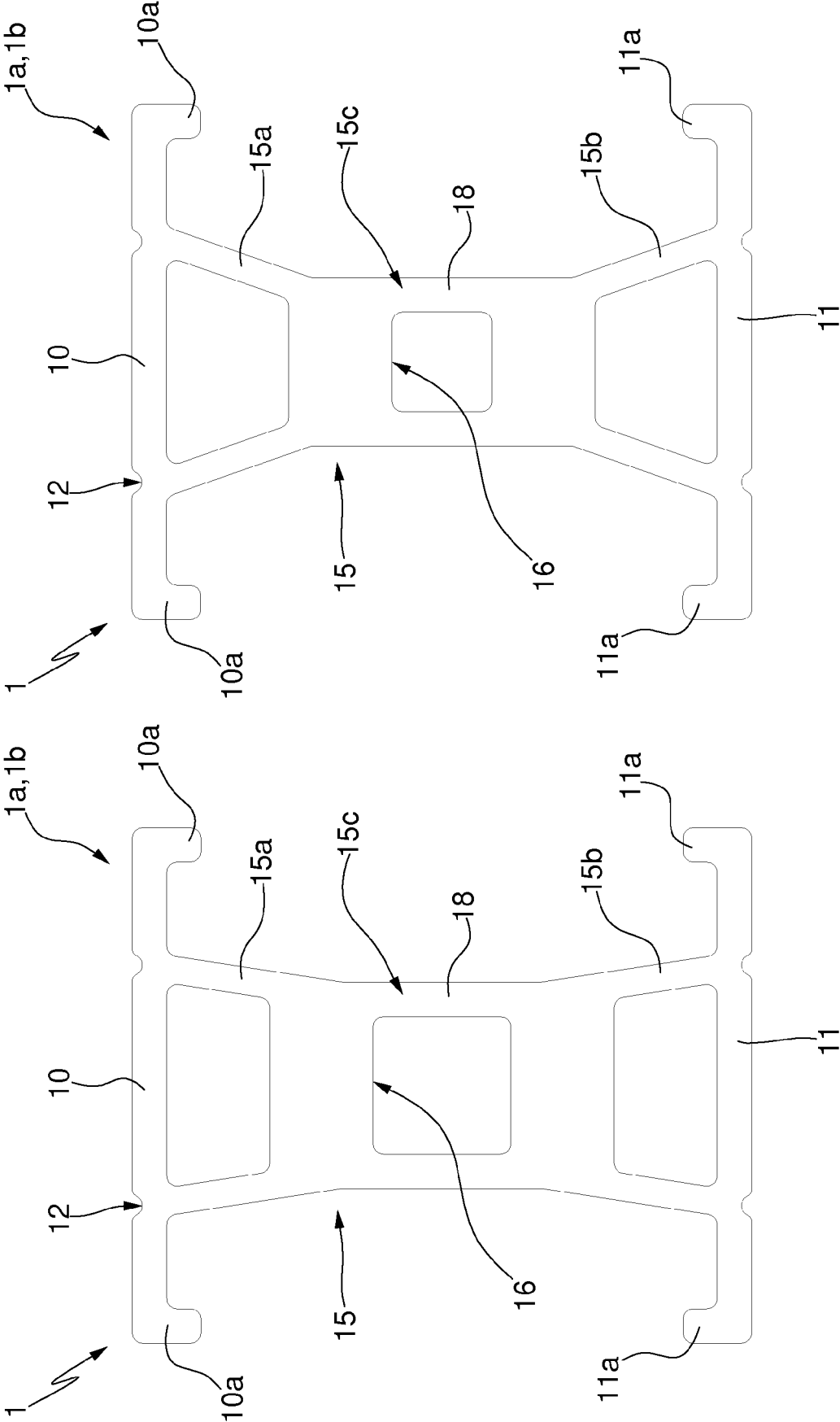


FIG. 16

FIG. 15

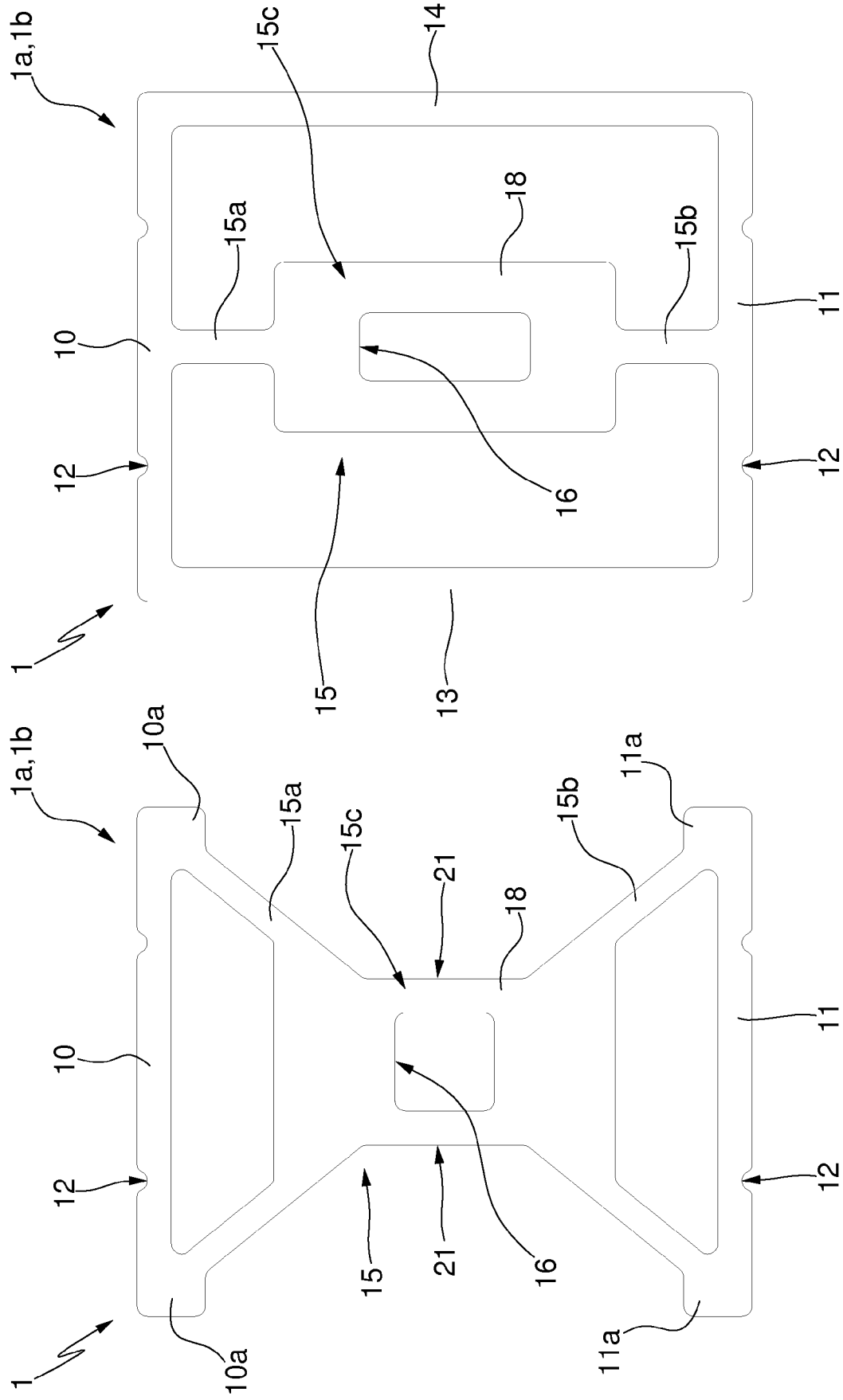


FIG. 18

FIG. 17

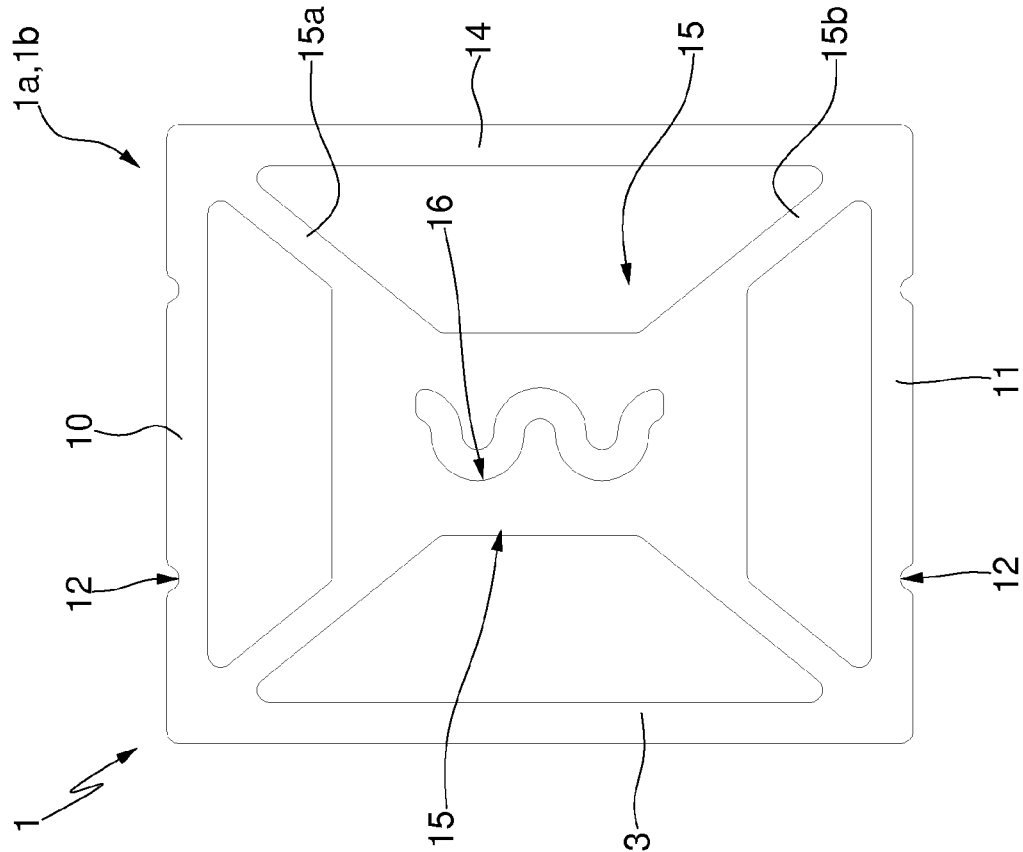


FIG. 20

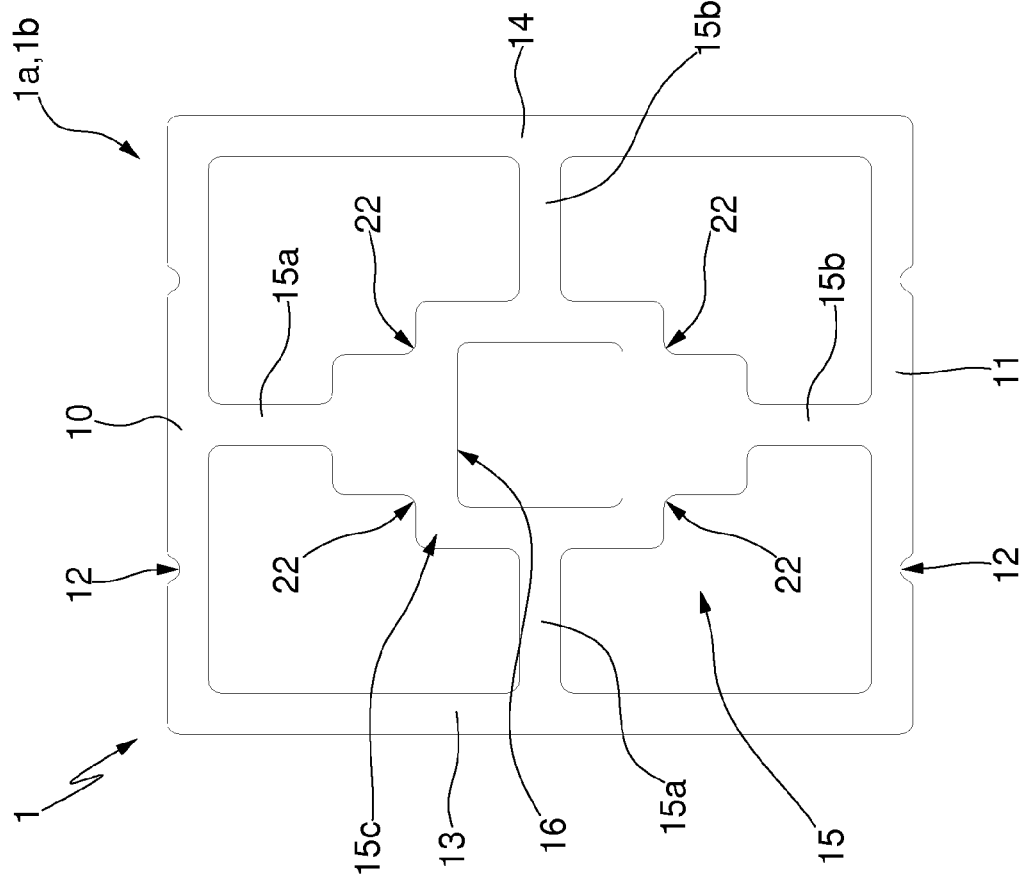


FIG. 19

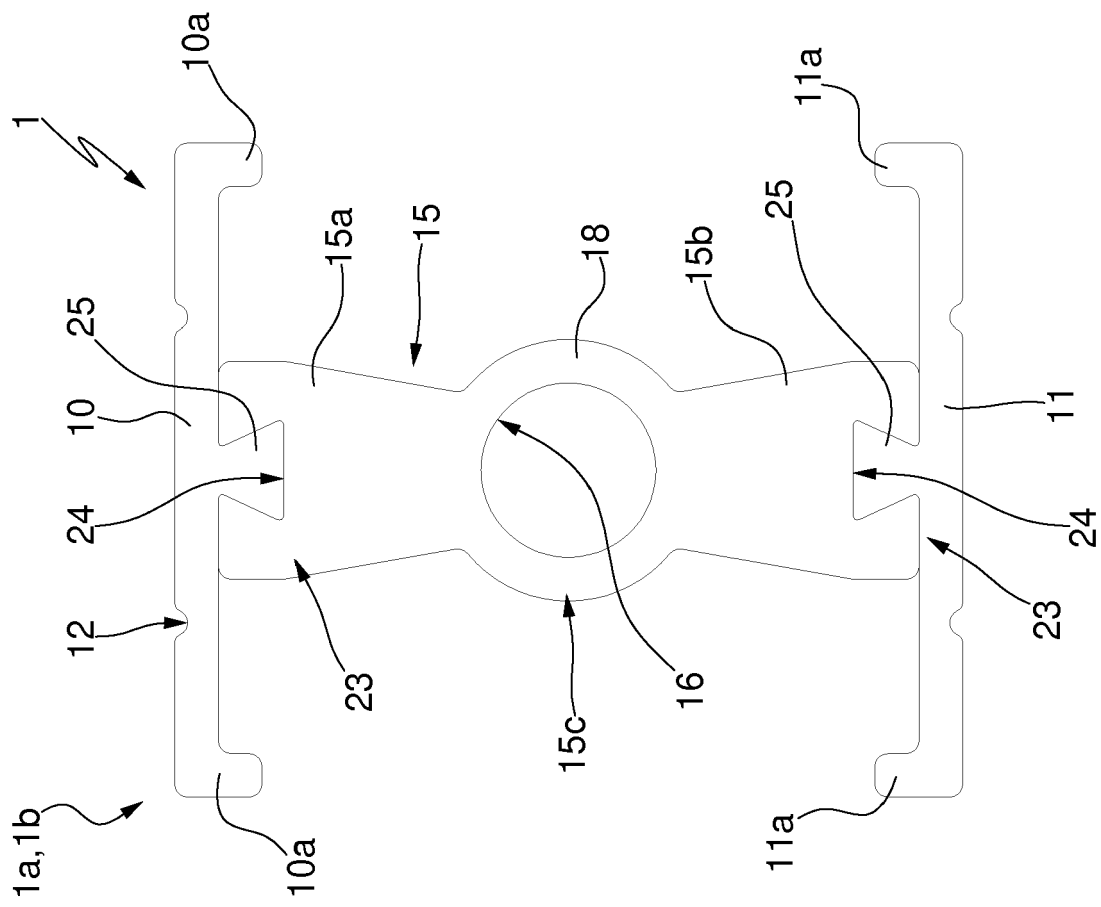


FIG. 21

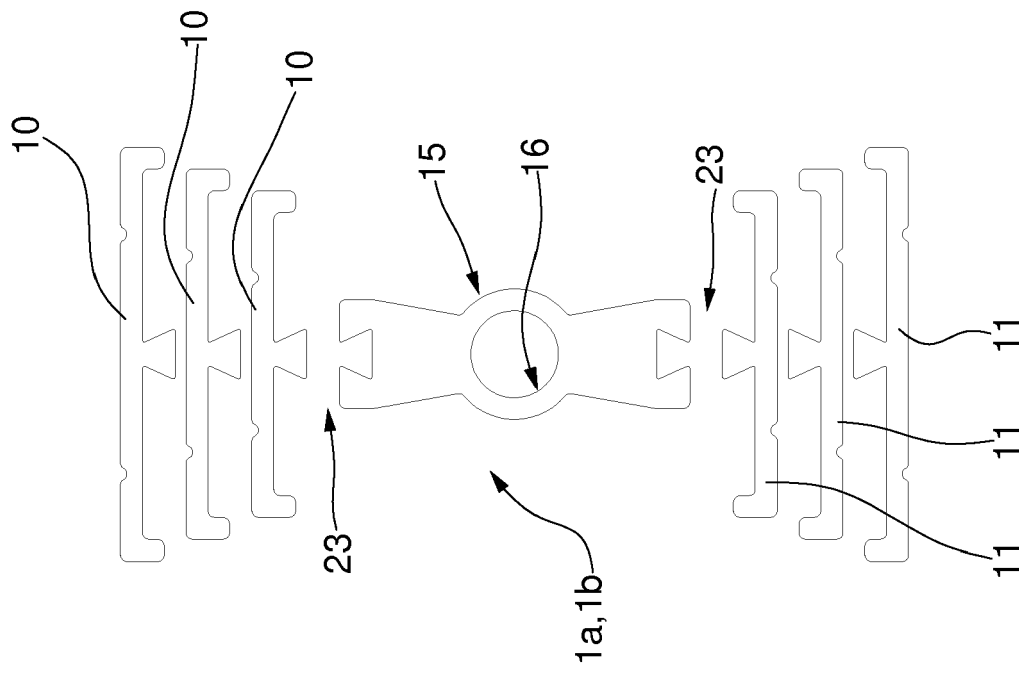


FIG. 22

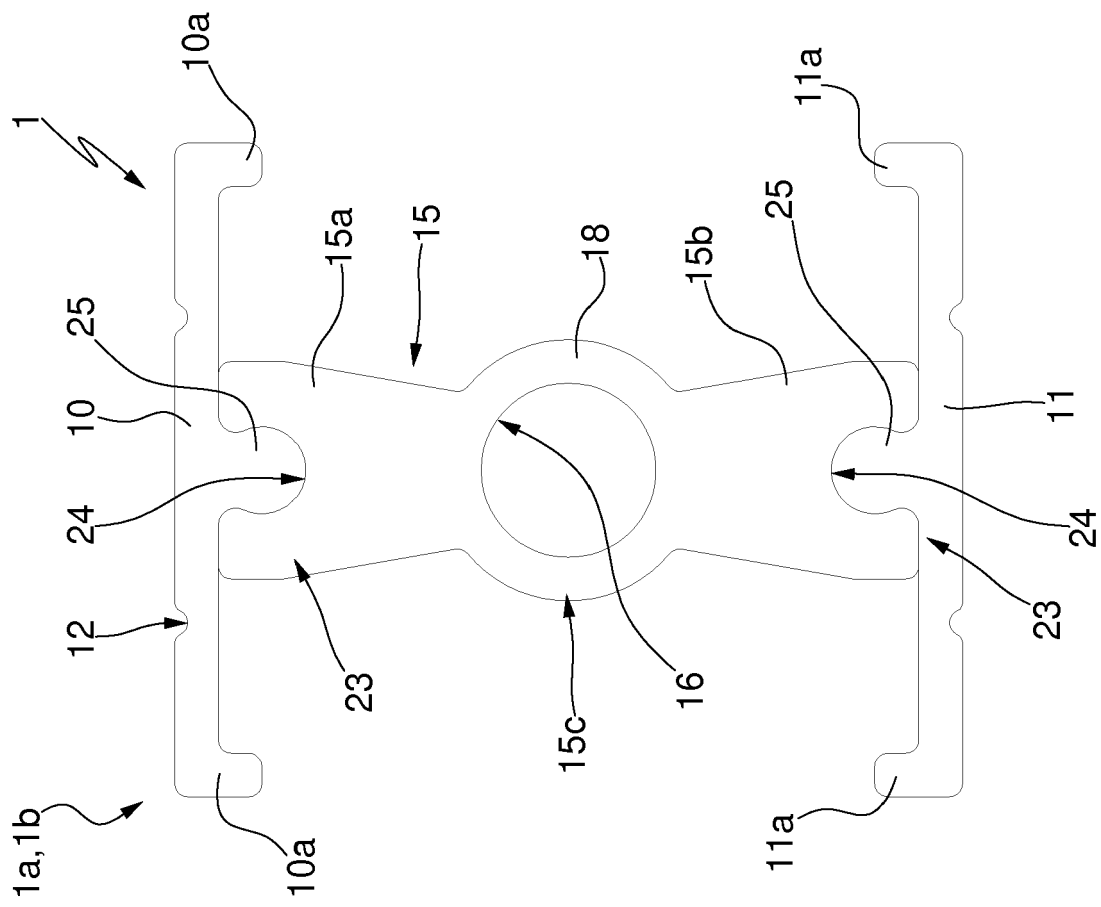


FIG. 23

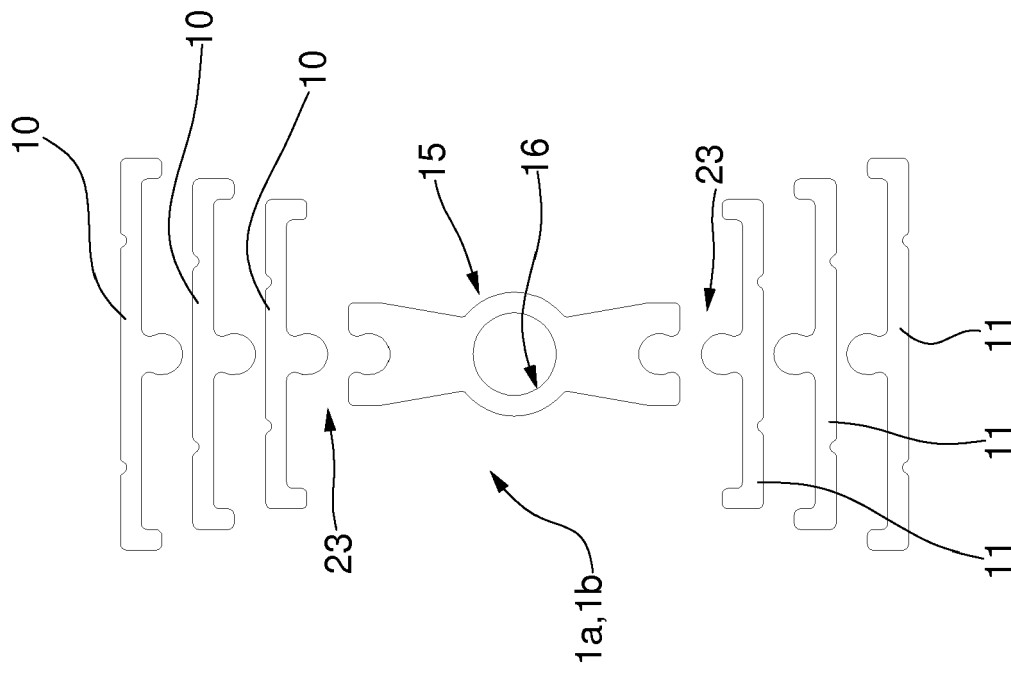


FIG. 24

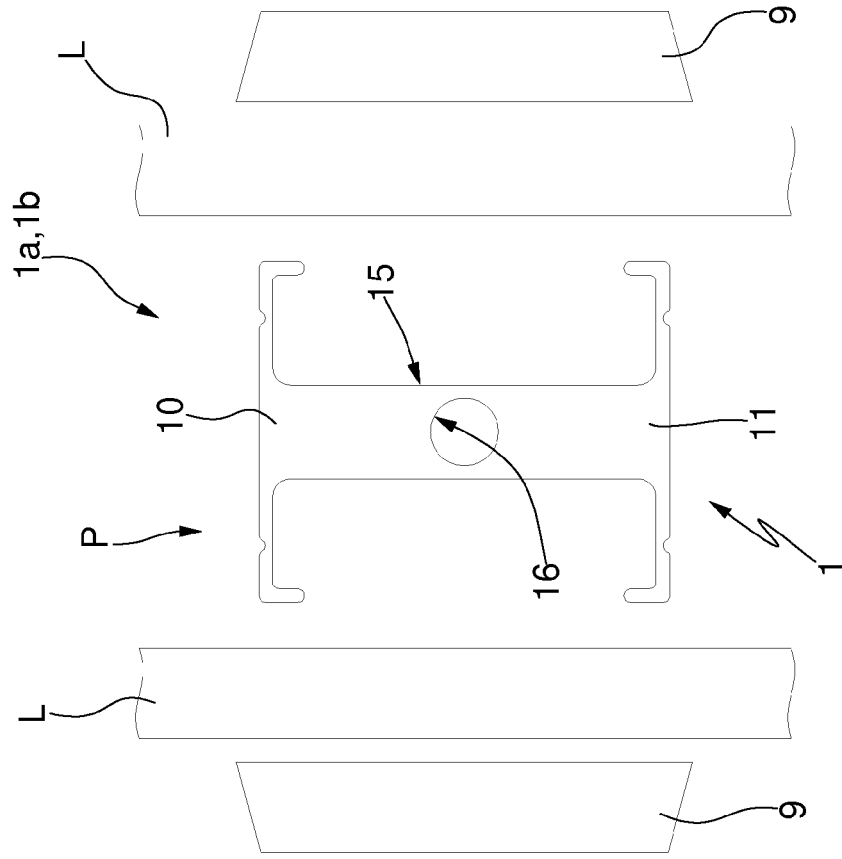


FIG. 25

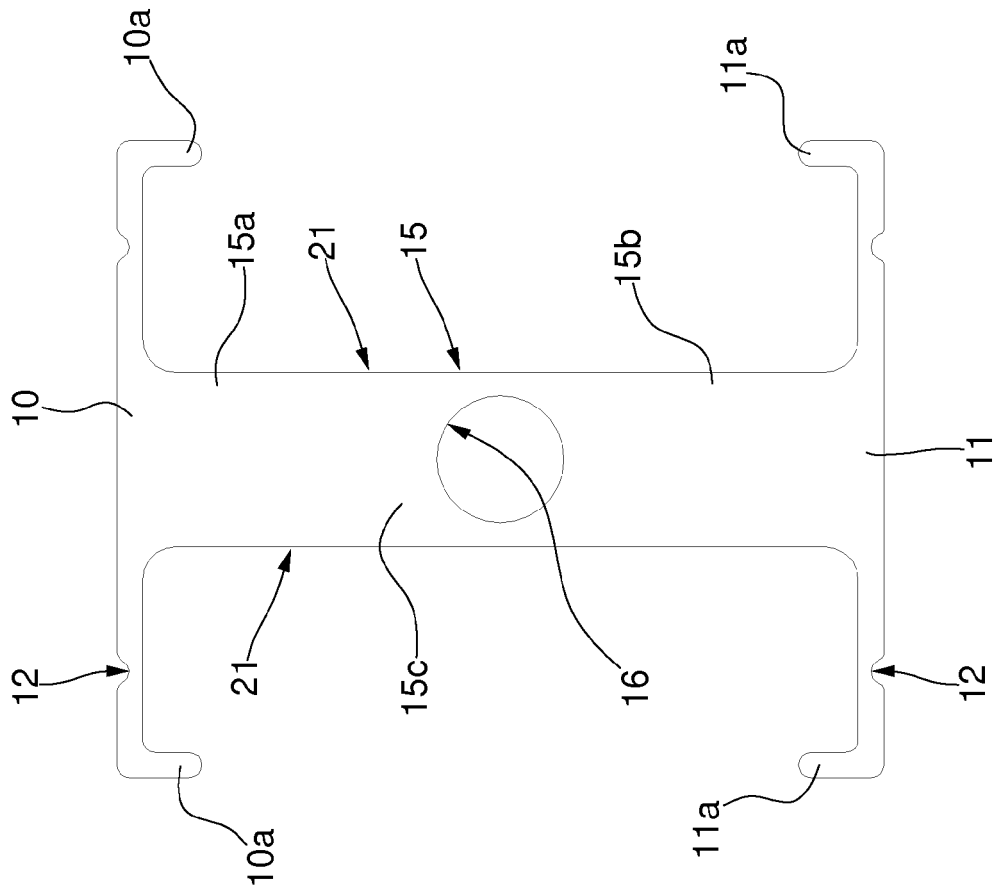


FIG. 26

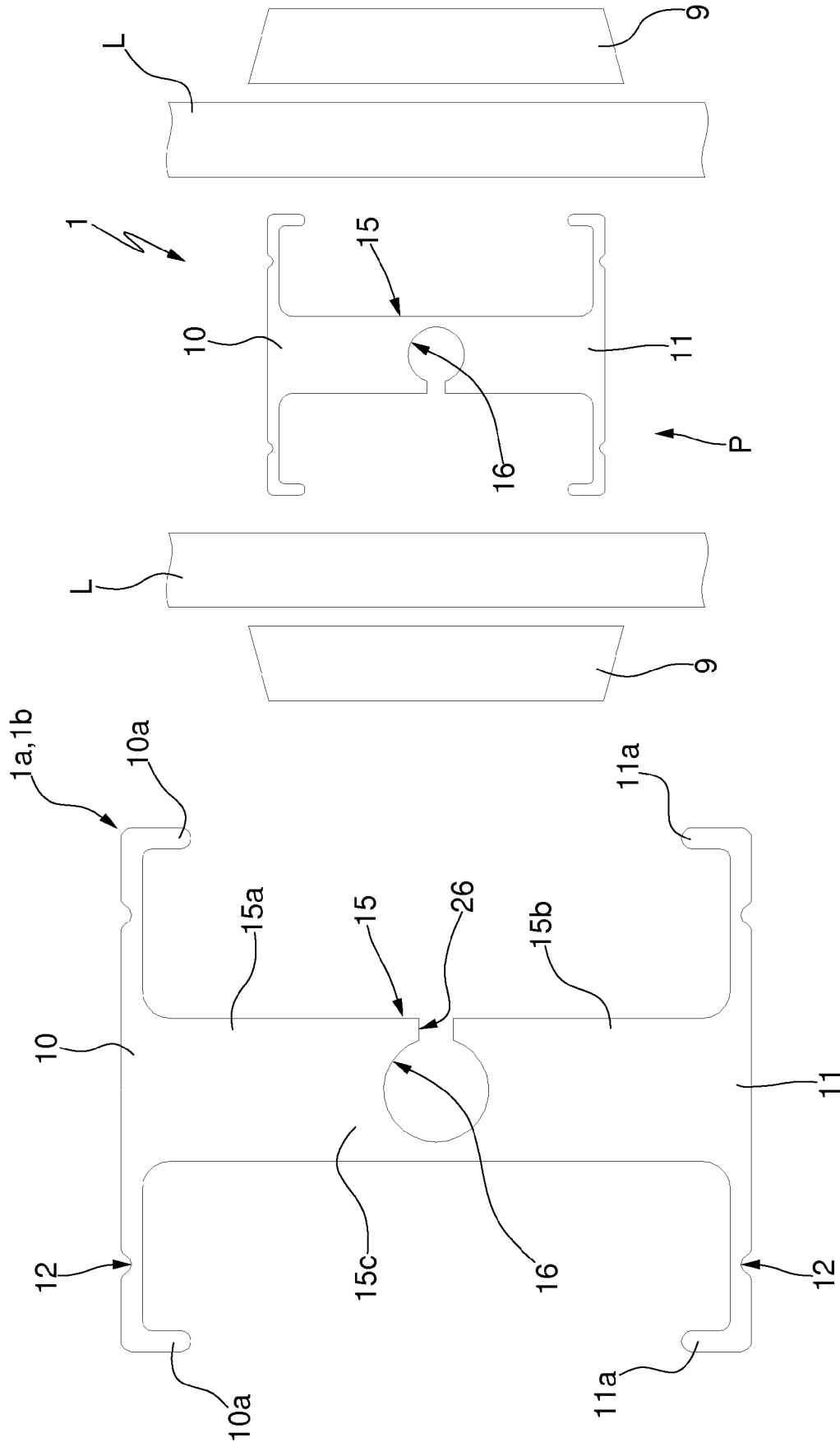


FIG. 27

FIG. 28

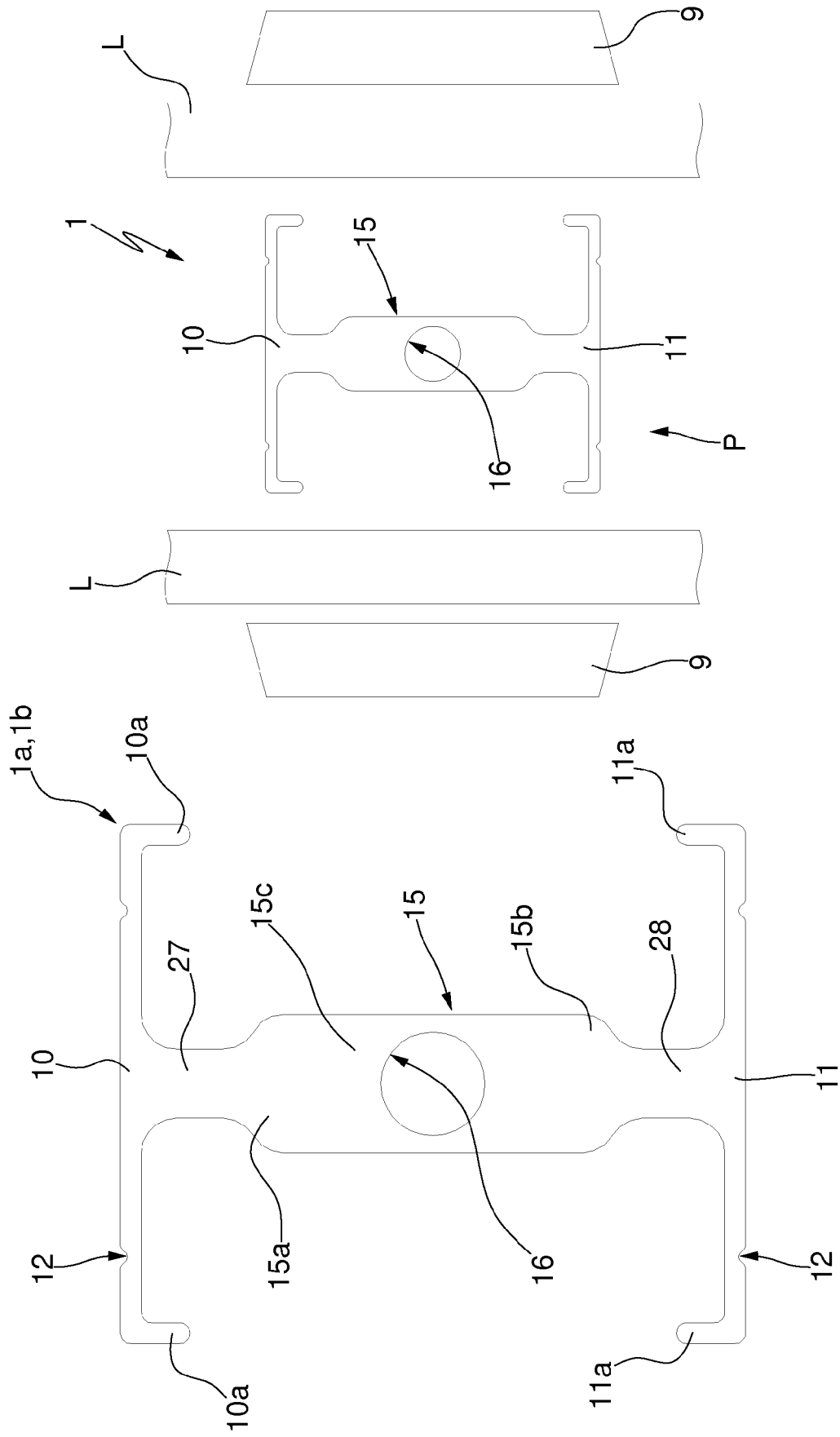


FIG. 30

FIG. 29

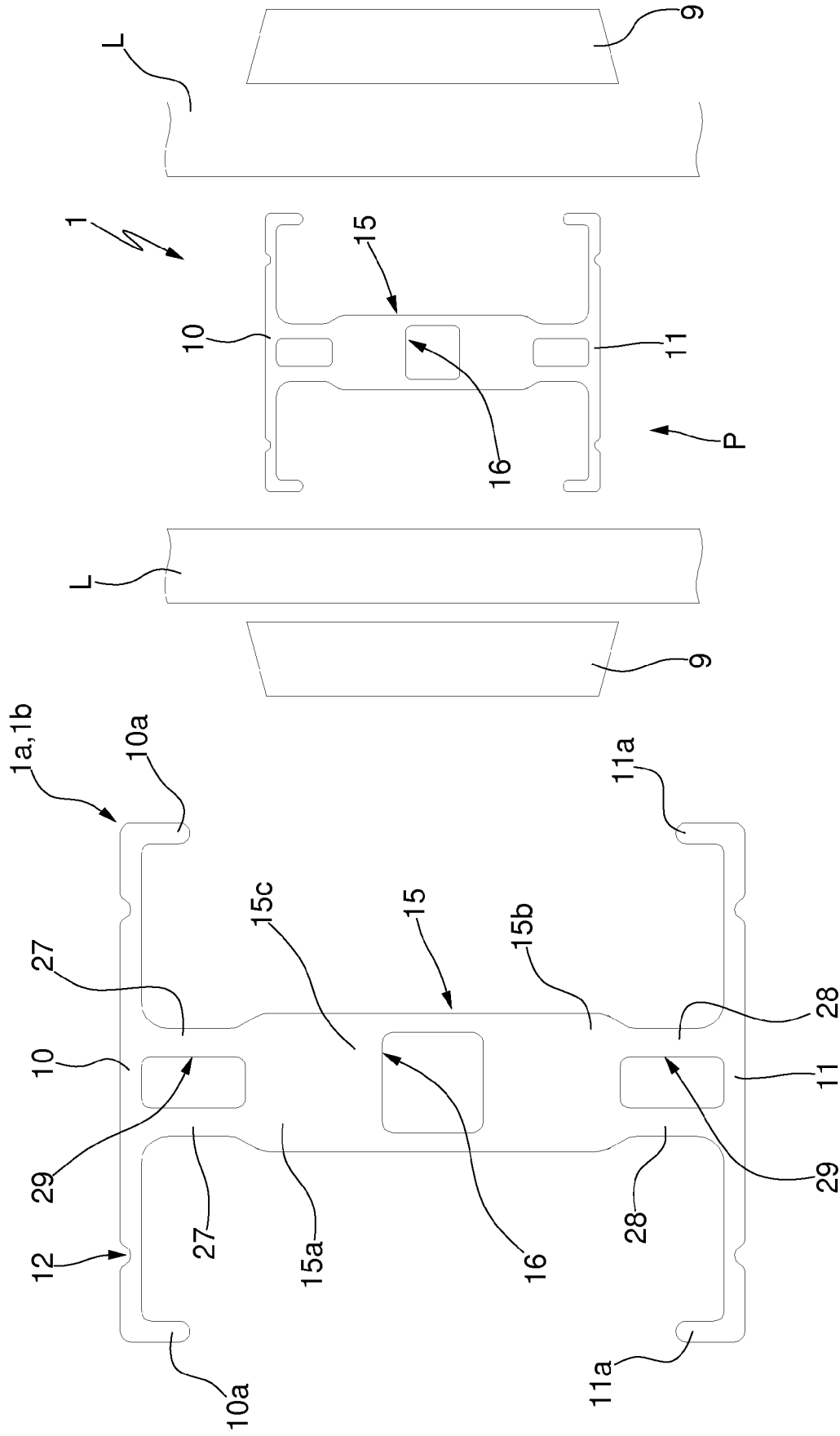
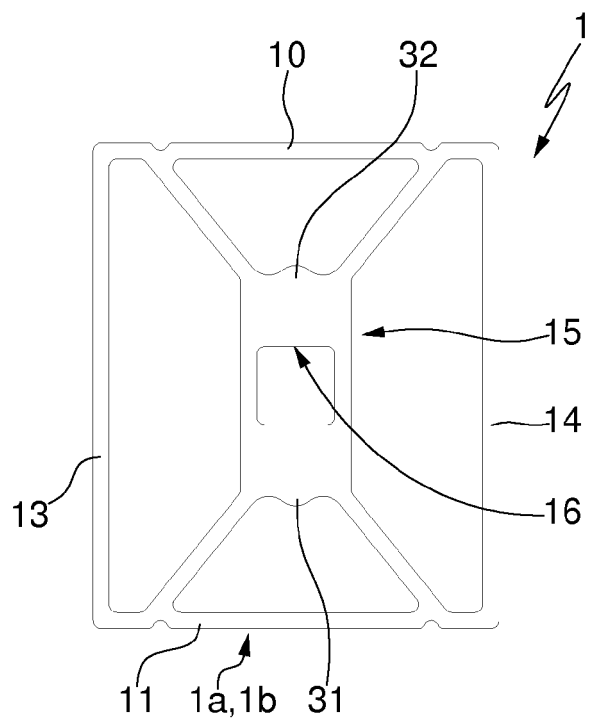
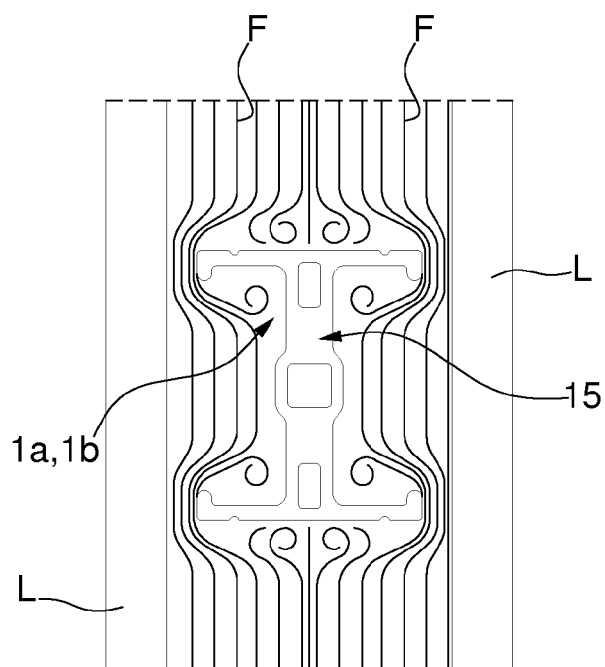
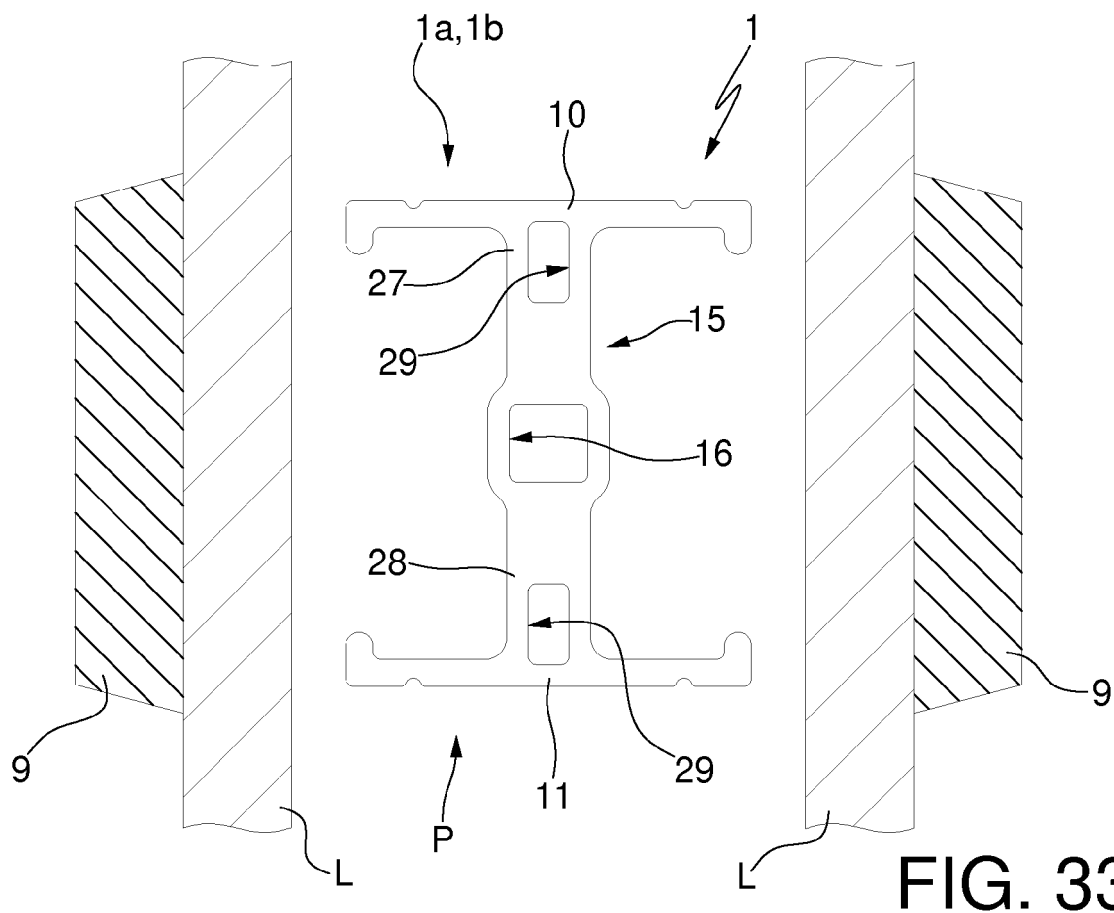


FIG. 31

FIG. 32



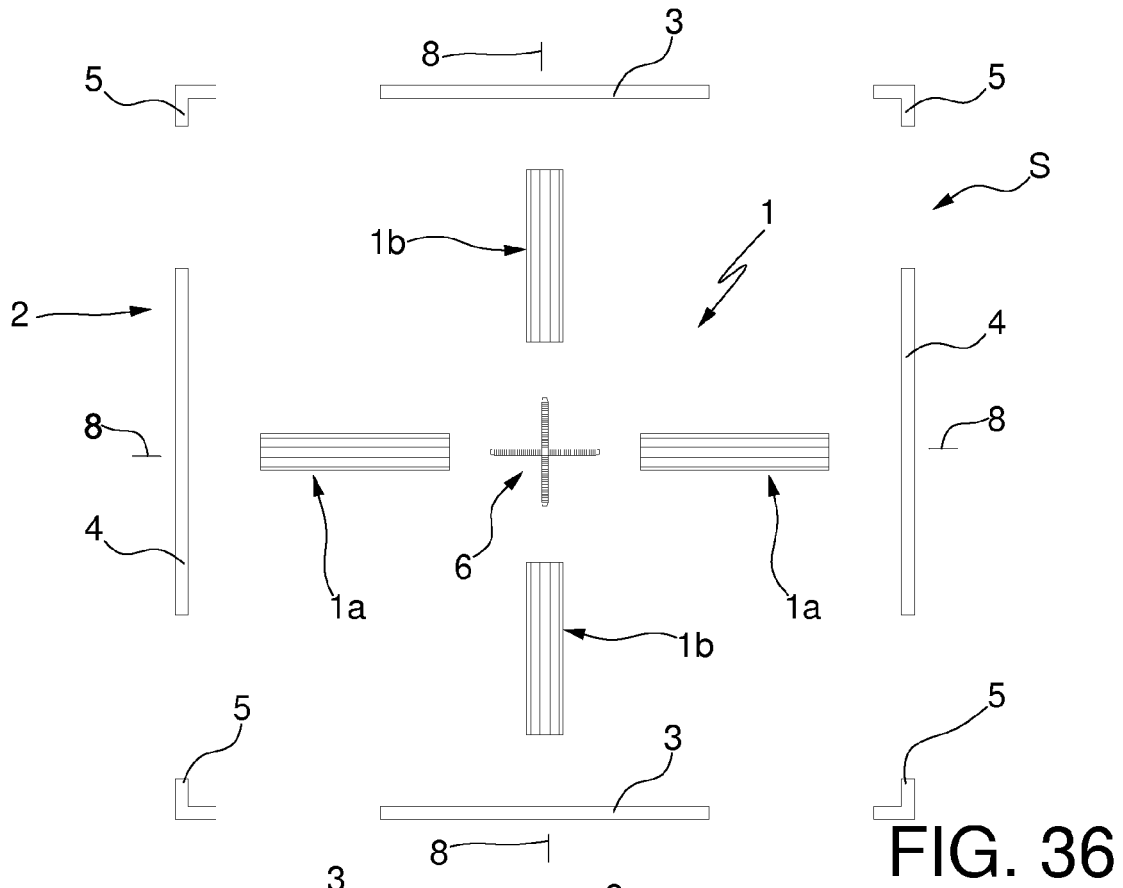


FIG. 36

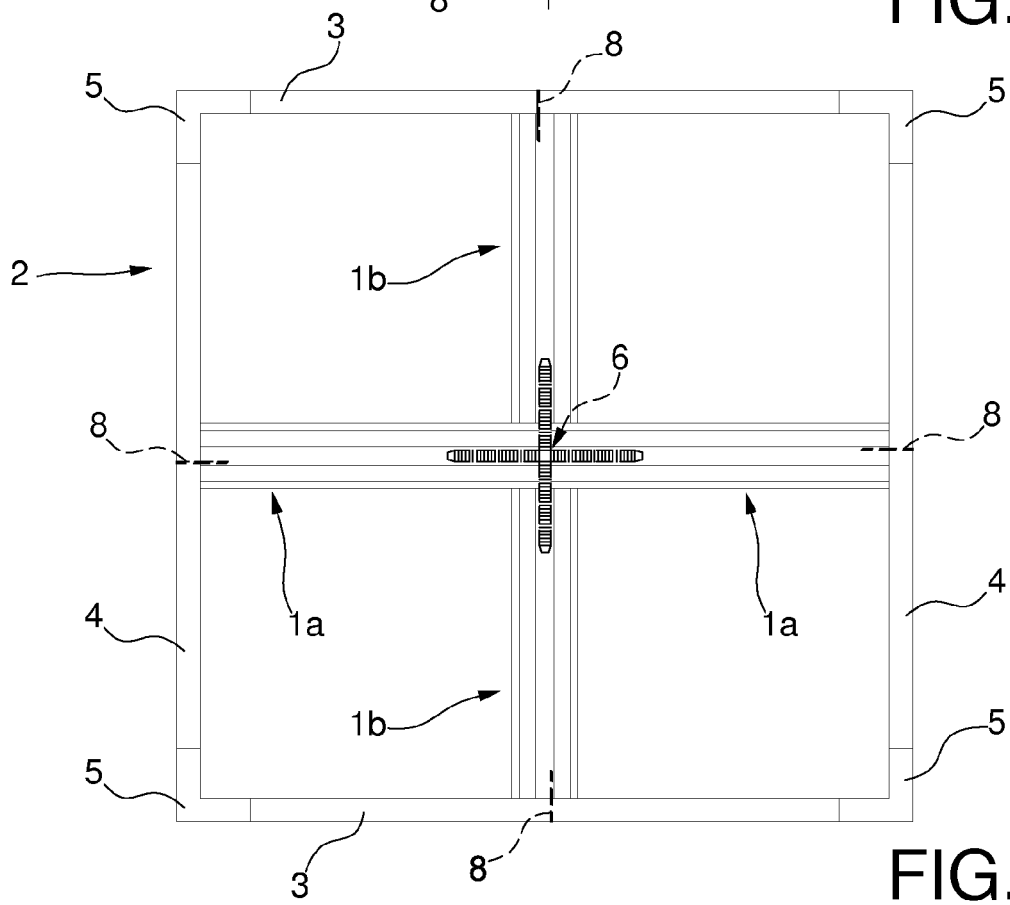
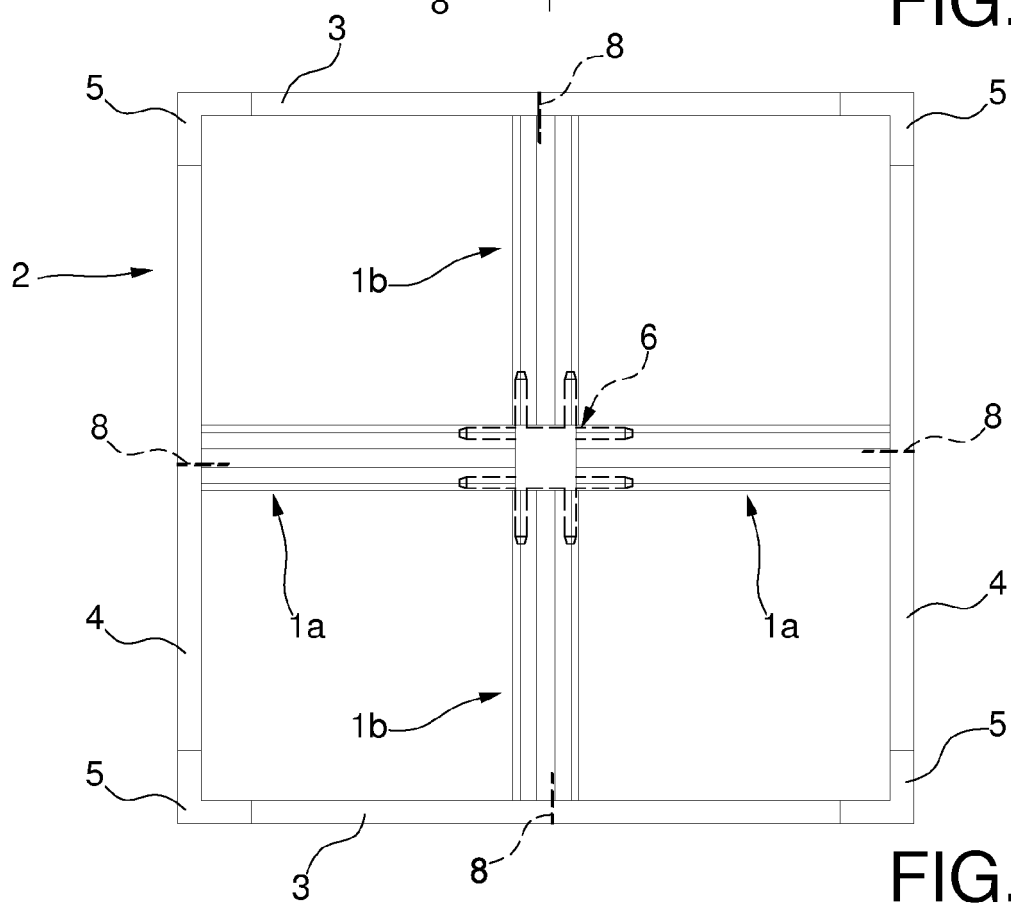
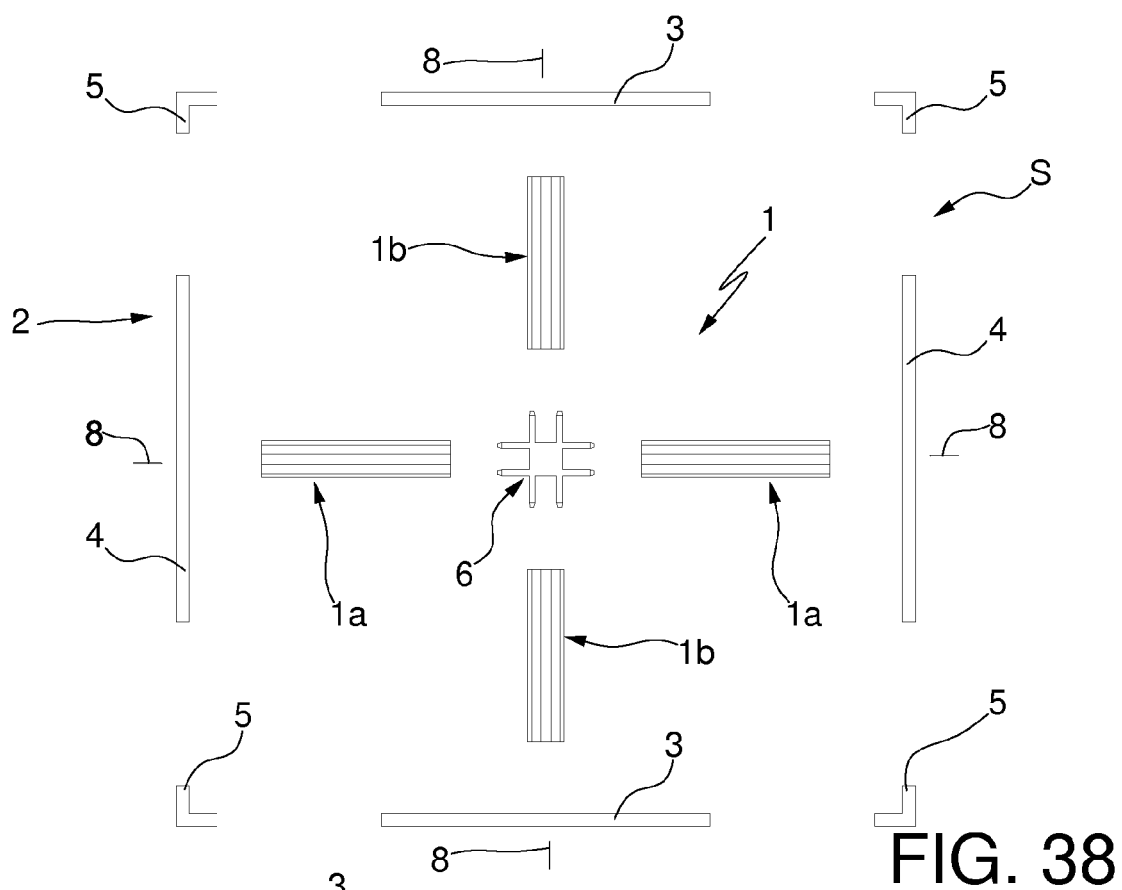


FIG. 37



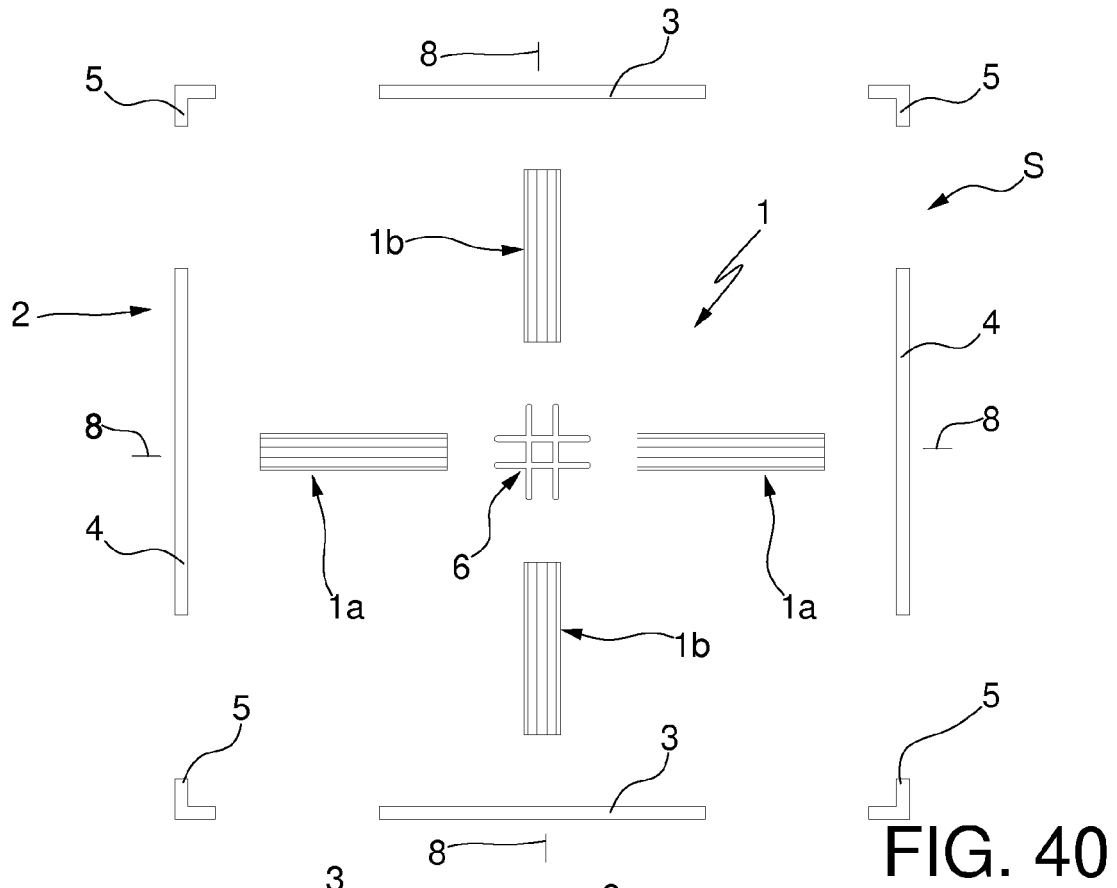


FIG. 40

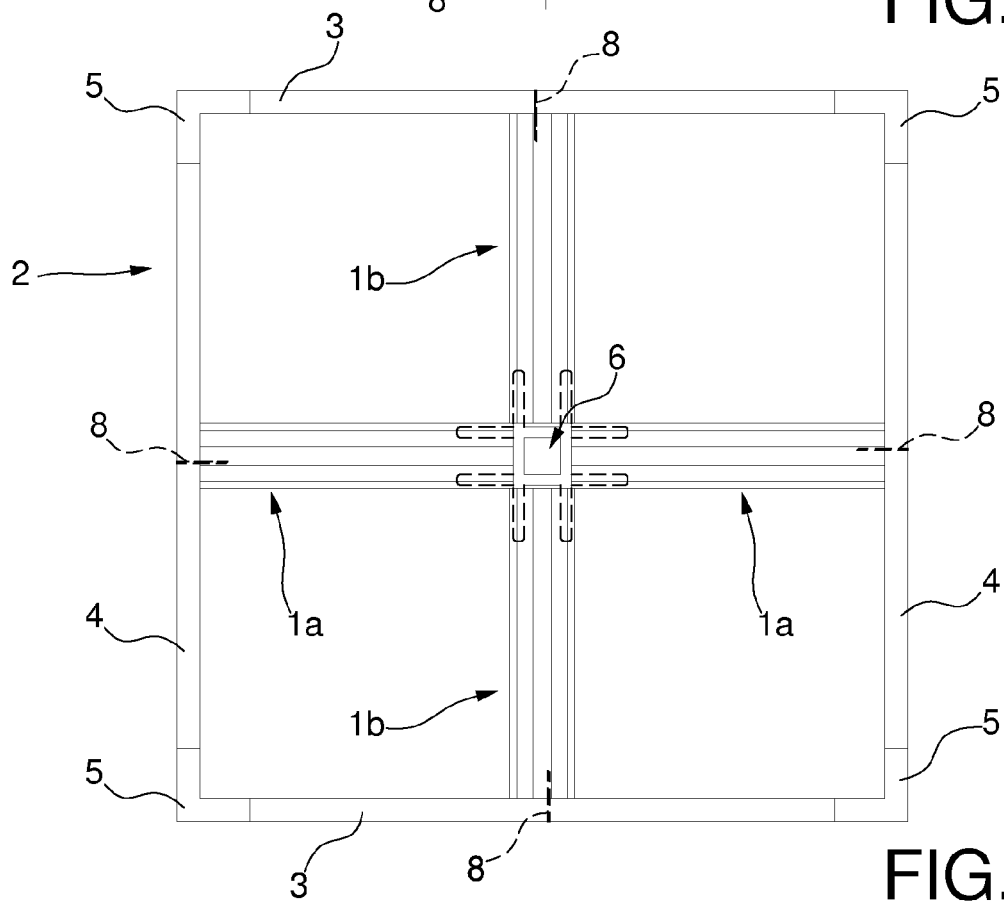


FIG. 41

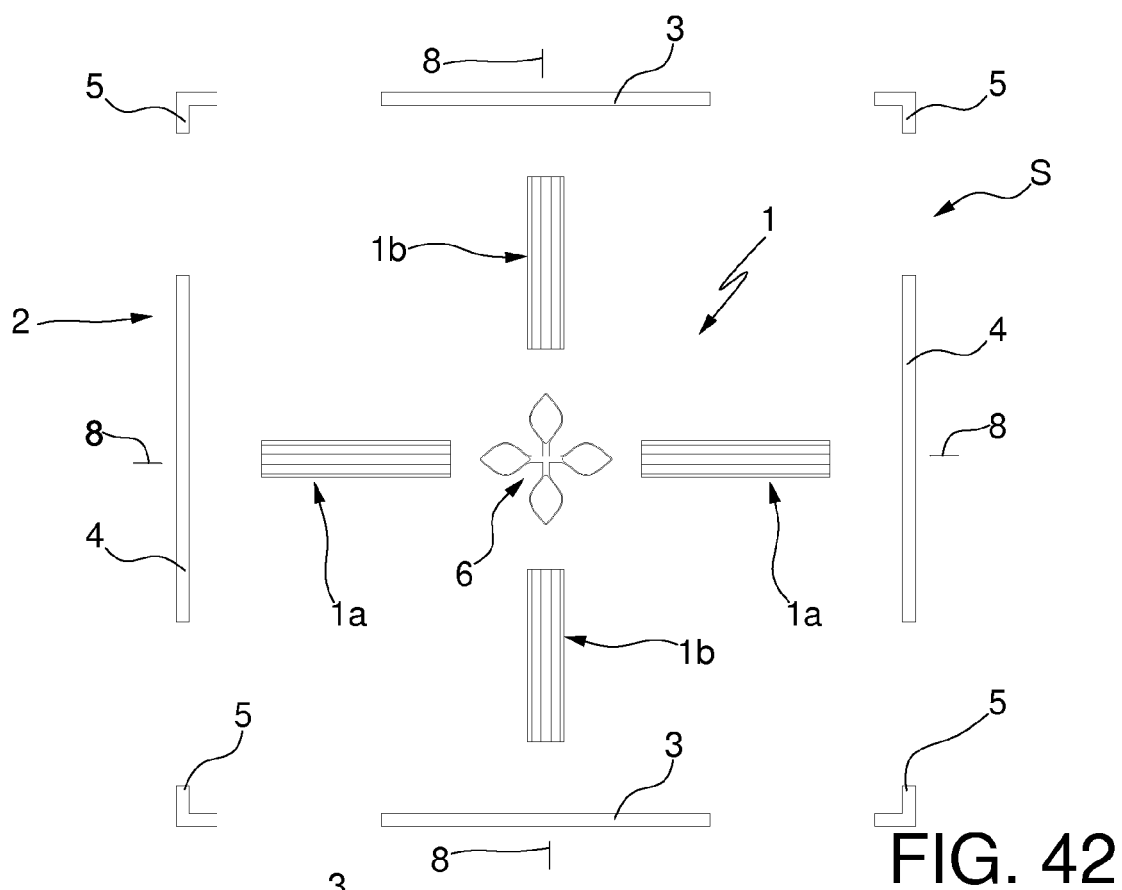


FIG. 42

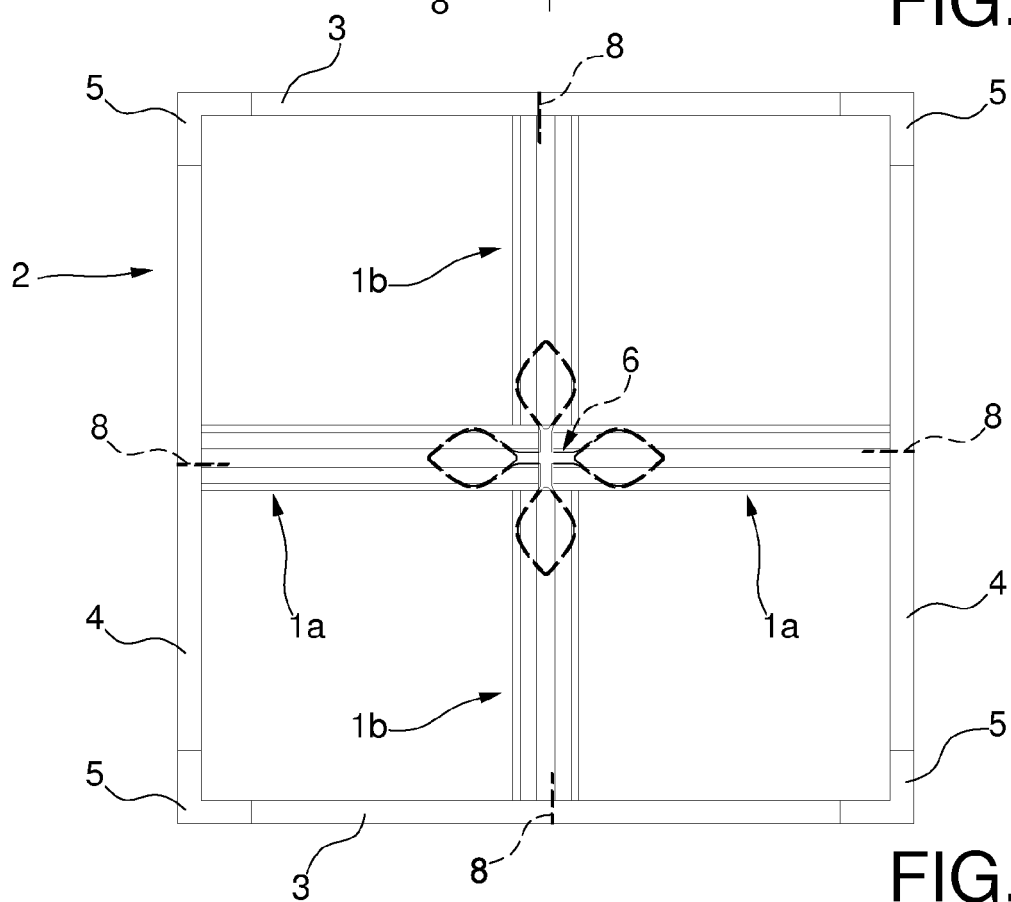


FIG. 43

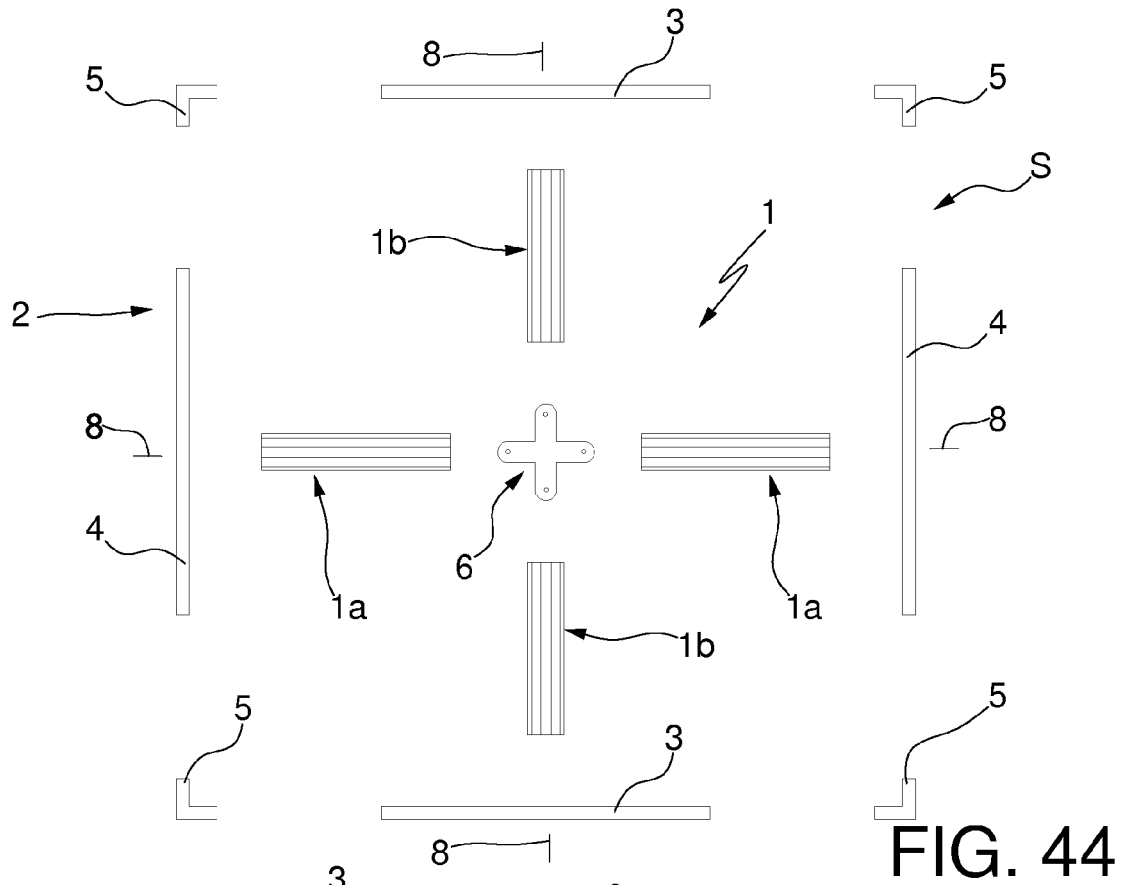


FIG. 44

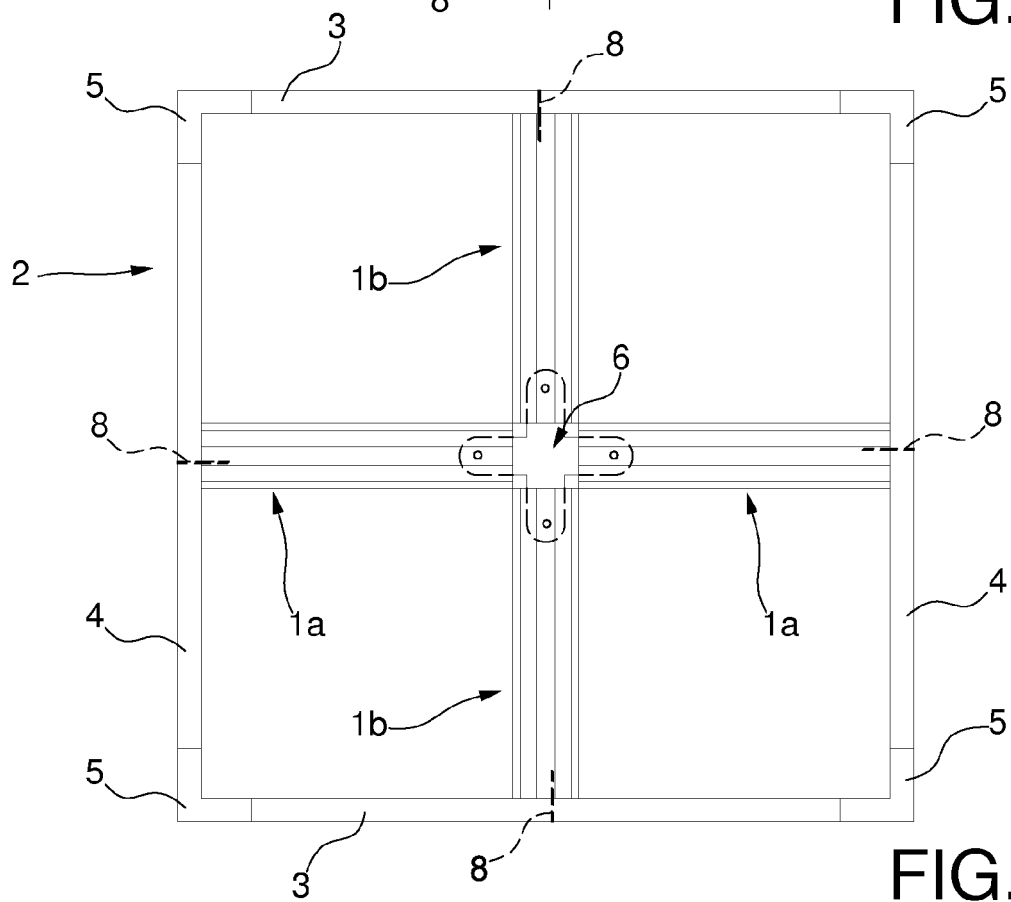


FIG. 45

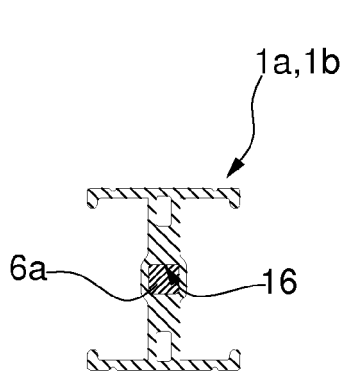


FIG. 48

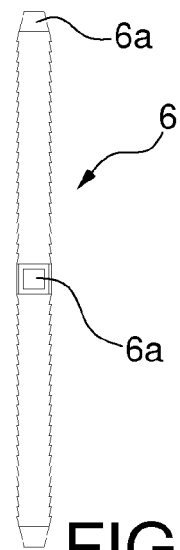


FIG. 47

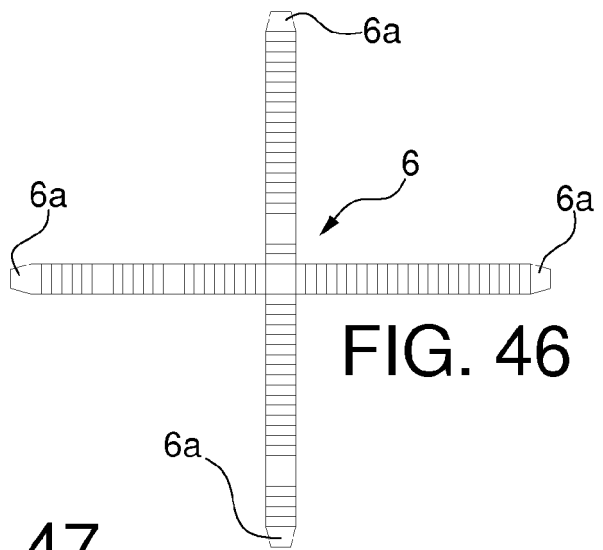


FIG. 46

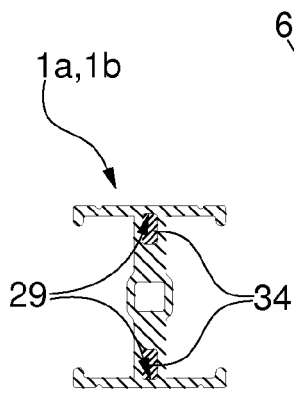


FIG. 51

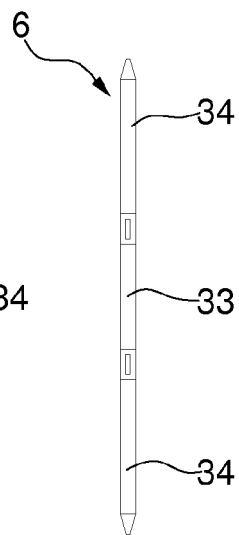


FIG. 50

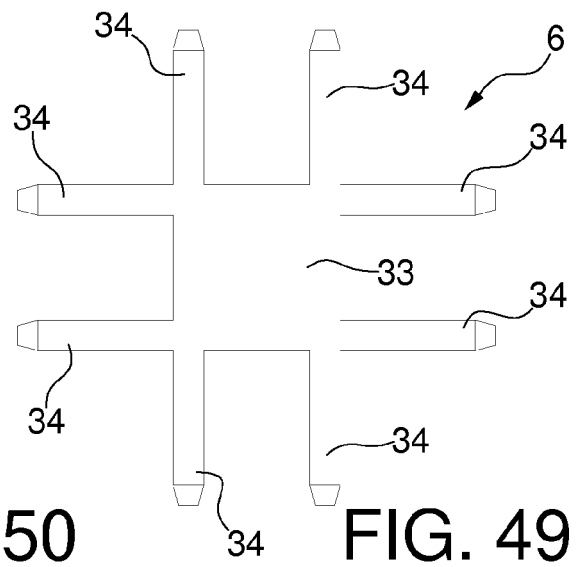


FIG. 49

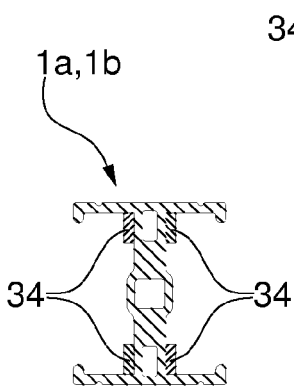


FIG. 54

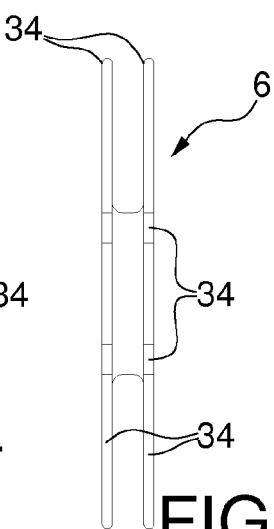


FIG. 53

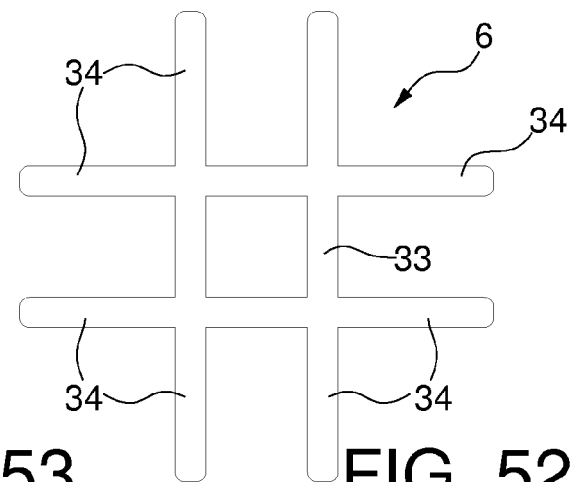


FIG. 52

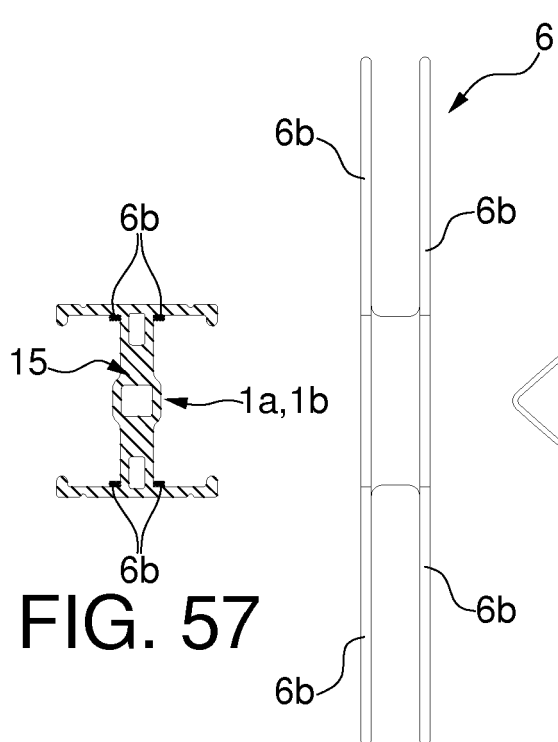


FIG. 57

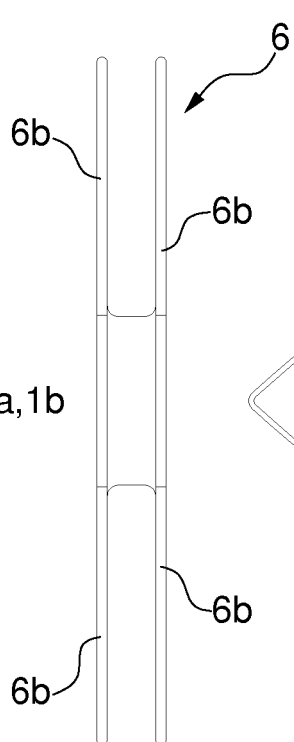


FIG. 56

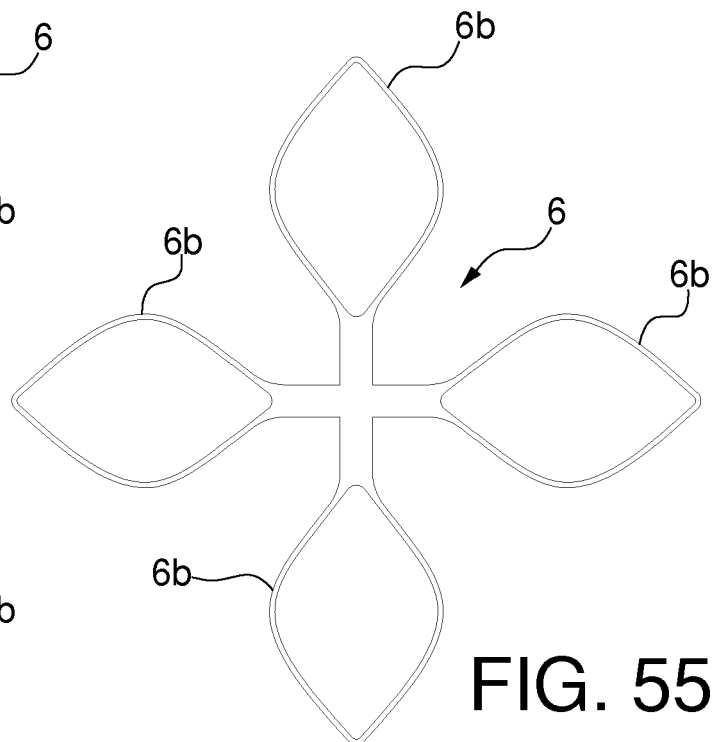


FIG. 55

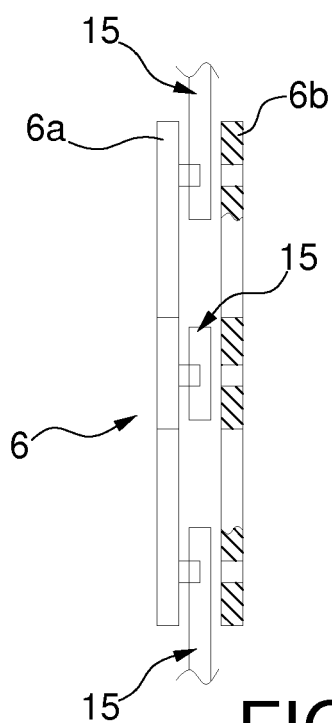


FIG. 59

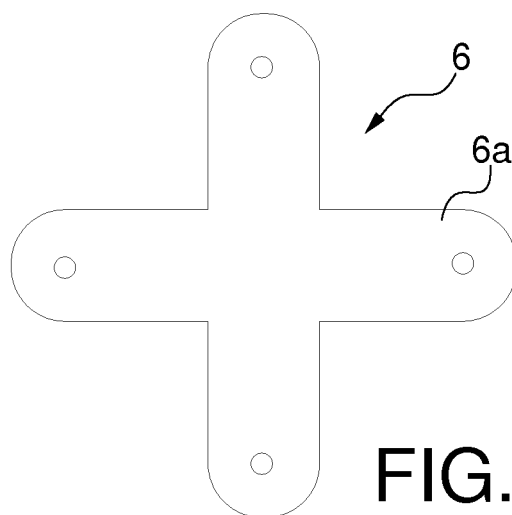


FIG. 58



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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                    |                                                        |                                         |
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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                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                    |                                                        |                                         |
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| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                                    |                                                        |                                         |

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