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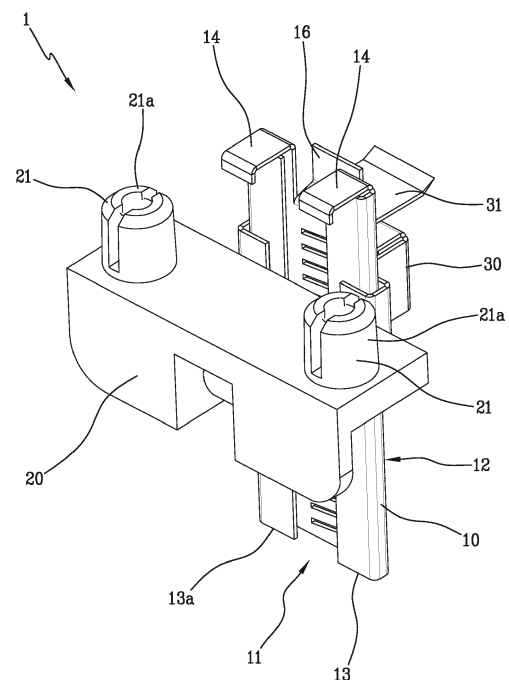
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(54) **DEVICE FOR FIXING A SINK**

(57) Device (1) for fixing a sink (L) in an opening of a plane (P), comprising a guide body (10), an anchoring body (20), constrained or constrainable to a first side of the guide body (10) and equipped with an anchoring means (21) for the stable fixing to a lower surface of a sink (L), and a retaining body (30), slidably applied on the guide body (10) and operationally arranged on a second side of the guide body (10). In particular, the retaining body (30) comprises a retaining element (31) configured, in use, to abut against a lower surface of a plane (P) and adjusting and clamping means (32) adapted to cause a controlled movement and stable positioning of the retaining body (30). The anchoring body (20) has a sliding portion (22) engaged or engageable on the guide body (10) such that the position of the anchoring body (20) along the guide body (10) can be regulated.

Fig.1



Description

TECHNICAL FIELD

[0001] The present invention relates to a device for fixing a sink in an opening of a plane, as well as to a sink fixable in the opening by means of a plurality of such devices.

[0002] The term "sink" refers to generic washbasins used in home and/or restaurant kitchens for washing dishes or for sanitary purposes, made of waterproof material, such as ceramic, stainless steel, natural or sintered stone, synthetic resins or composite material.

PRIOR ART

[0003] Currently, on the market, there are many variants of fixing devices for sinks.

[0004] Typically, known devices comprise a first body fixable to a lower surface of a sink by means of an anchoring means and a second body, slidably constrained to the first body, which has a retaining element configured to abut the lower surface of the plane, commonly called "top", the latter having an opening for housing the sink. The anchoring means is typically with expansion plugs and is housed in respective seats arranged on the lower surface of the sink.

[0005] The fixing devices further comprise adjusting and clamping means configured to cause the second body to slide with respect to the first body, in such a way as to apply a clamping force adapted to stabilize the sink and make it as adhering as possible to the upper surface of the plane. Specifically, the first body, by means of the anchoring means, exerts a traction action on the lower surface of the sink while the second body, by means of the retaining element, exerts a thrust action on the lower surface of the plane. In other words, the thrust action on the plane generates a traction reaction on the anchoring means constrained to the sink.

[0006] Although widely used, these fixing devices have a series of disadvantages which make their use not very efficient.

[0007] First of all, the clamping force exerted by the device on the sink is substantially parallel and concordant with the extraction direction of the anchoring means and therefore it is possible that, while clamping the device, the anchoring means comes out from their respective seats.

[0008] The result is a clamping limit of the device which is sometimes not sufficient to guarantee a stable and correct fixing of the sink to the plane. This problem is typically solved by using glues or adhesives adapted to improve the constraint of the anchoring means. However, this solution makes the laying and installation operations more complex.

[0009] A further problem concerns the versatility of use of the fixing devices. In fact, known devices are configured to operate in a determined dimensional range de-

finied by the thickness of the plane and of the sink.

[0010] In the event that the thickness of the plane and/or the thickness of the sink are insufficient to guarantee an optimal fixing, the operator is forced to interpose a thickness between the lower surface of the plane and the retaining element of the fixing device, making the operations for laying and installing the sink more complex.

10 OBJECTS OF THE INVENTION

[0011] In light of the above, the technical task of the present invention is to propose a device for fixing a sink in an opening of a plane capable of overcoming the drawbacks of the prior art. It is also a technical task of the present invention to make available a sink fixable in an opening of a plane by means of one or more fixing devices in accordance with the invention. In particular, an object of the present invention is to make available a device for fixing a sink which is extremely versatile.

[0012] A further object of the present invention is to propose a device for fixing a sink which is sturdy and capable of guaranteeing a stable fixing of the sink.

[0013] Another object of the present invention is to realize a device for fixing a sink capable of facilitating and optimising the operations for laying and installing the sink itself.

[0014] The stated technical task and specified objects are substantially reached by a device for fixing a sink in an opening of a plane and by a sink fixable by means of one or more of said fixing devices, which comprise the technical features disclosed in the independent claims. The dependent claims correspond to further advantageous aspects of the invention.

35 BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Additional features and advantages of the present invention will become more apparent from the approximate and hence non-limiting description of one or more embodiments, as illustrated in the accompanying drawings, in which:

- figure 1 illustrates a perspective view of a device for fixing a sink according to the present invention;
- figure 2 illustrates a further perspective view of the device shown in figure 1;
- figures 3A and 3B illustrate respective side views of the device shown in figure 1 in distinct operating configurations;
- figures 4A, 4B, 4C and 4D illustrate perspective views of constructive components of the device shown in figure 1;
- figures 5, 6A, 6B and 6C illustrate schematic perspective views of further components of the device shown in figure 1.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Figures 1, 2, 3A and 3B illustrate a device 1 for fixing a sink "L" in an opening of a plane "P", in accordance with the present invention. The device 1 for fixing a sink (henceforth also simply "device 1") finds application in the fitting of generic sinks used in home and restaurant kitchens for washing dishes and/or for sanitary purposes.

[0017] Advantageously, the device 1 can be used with sinks made of various materials, for example ceramic, stainless steel, natural or sintered stone. Even more advantageously, the device 1 according to the invention finds particular and effective use with sinks made of resin or composite material. With reference to figures 1 to 3B, the device 1 comprises a guide body 10 with an elongated conformation and which extends along a direction of extension "X". Furthermore, the device 1 comprises an anchoring body 20, constrained or constrainable to a first side 11 of the guide body 10, and a retaining body 30, slidably applied to the guide body 10 along the direction of extension "X" thereof. In greater detail, the retaining body 30 is operationally arranged on a second side 12 of the guide body 10 opposite the first side 11. In accordance with an aspect of the invention, with reference to figure 5, the guide body 10 is plate-like or in any case has a longitudinal dimension, along the direction of extension "X", which is predominant with respect to the width and thickness thereof. In accordance with a further aspect, the guide body 10 preferably comprises a metal sheet.

[0018] With reference to figures 1 to 3B, the anchoring body 20, constrained or constrainable to the first side 11 of the guide body 10, is equipped with an anchoring means 21 for the stable fixing to a lower surface of a sink "L". In the present description, the term "constrained" means that the anchoring body 20 is irreversibly coupled to the guide body 10. Likewise, the term "constrainable" means that the anchoring body 20 can be reversibly coupled to the guide body 10. The anchoring means 21 comprises at least one expansion plug 21a obtained integrally with the anchoring body 20 and configured to be inserted into at least one respective receiving seat "L2" obtained on the lower surface of the sink "L" (figure 3). In accordance with a preferred aspect of the invention, the anchoring body is equipped with two expansion plugs 21a.

[0019] With specific reference to figure 2, the at least one expansion plug 21a is configured to house a respective expander 21b. In particular, the expander 21b can have cylindrical or wedge conformation, with a smooth or corrugated surface and can be inserted slidably into the respective expansion plug 21a by means of a certain pressure. Alternatively, the expander 21b can be a cylindrical threaded member which can be clamped inside the expansion plug 21a. In accordance with a further alternative aspect, the anchoring means 21 and the seat "L2" can comprise threaded elements, which are reciprocally and reversibly constrainable.

[0020] With reference to figure 1, the anchoring body 20 has a sliding portion 22 engaged or engageable with a respective guide portion 13 of the guide body 10 such that the position of the anchoring body 20 can be adjusted and/or regulated along the guide body 10. Preferably, the sliding of the sliding portion 22 inside the guide portion 13 occurs by slipping, so as to define a substantially stable positioning of the anchoring body 20 along the guide body 10.

[0021] Advantageously, as will become clearer in the continuation of the present invention, the possibility of moving and regulating the anchoring body 20 along the guide body 10 together with the possibility of moving and fixing the retaining body 30 along the guide body 10 allows the device 1 to be used in a large dimensional range of thicknesses of the plane "P" and/or of the sink "L".

[0022] With reference to figures 4A and 4B, the anchoring body 20 comprises a first component 20a that is stably applicable to the sink "L". Furthermore, the sliding portion 22 comprises a second component 20b that is slidably applicable to the guide body 10. In accordance with an aspect of the invention, the first and second component 20a, 20b are reciprocally hinged or hingeable, so as to be tiltable respectively around a tilt axis "Y" that is transverse, preferably perpendicular, to the direction of extension "X" of the guide body 10. Advantageously, when the device 1 is fixed to the sink "L", this degree of freedom (tilting) allows to vary the orientation of the guide body 10, and therefore of the retaining body 30 constrained to the guide body 10, with respect to the sink "L" itself. In other words, once the device 1 has been constrained to the sink "L" by means of the anchoring means 21, the guide body 10 can be inclined with respect to the sink "L". In this way, the advantage of facilitating the operations for laying and installing the sink "L" in the opening of the plane "P" is obtained, since the device 1 does not hinder manoeuvres for inserting the sink "L" inside the opening itself, as illustrated in figure 3B. In fact, when the guide body 10 is inclined, the retaining element 31 in turn assumes a position away from the encumbrance of the plane "P" (or from a projection thereof in vertical direction), thus allowing an easy insertion of the sink "L" inside the opening of the plane "P" itself. Advantageously, moreover, the aforementioned degree of freedom (tilting) allows the device 1 to be adapted to a multiplicity of conformations of the sink "L" and/or of the plane "P".

[0023] In accordance with a further aspect of the invention better visible in figures 4C and 4D, the device 1 can comprise recall means 22d configured to promote a reciprocal movement between the first and the second component 20a, 20b. In particular, the recall means 22d is preferably interposed between the first and the second component 20a, 20b.

[0024] In greater detail, the recall means 22d promotes a reciprocal movement between the first and the second component 20a, 20b around the tilt axis "Y" in order to orient, in use, the guide body 10 so that it is not vertical and does not hinder the operations for inserting the sink

"L" inside the opening of the plane "P". In other words, once the device 1 is fixed to the sink "L", the recall means 22d prevents the guide body 10 from assuming a vertical orientation.

[0025] A preferred embodiment of the recall means 22d is illustrated by way of example in figures 4C and 4D. In this embodiment, the second component 20b has one or more elastically deformable elements, preferably fins, configured to abut the first component 20a. Alternatively, the device 1 can comprise one or more torsional springs interposed between the first and the second component 20a, 20b.

[0026] In accordance with an aspect of the invention better visible in figures 1 and 4B, the sliding portion 22 comprises a sliding slide 22a and the guide portion 13 of the guide body 10 is defined by folded edges 13a of the guide body 10. In particular, the folded edges 13a are made in such a way as to be parallel to the direction of extension "X" and are adapted to constrain the sliding slide 22a in a translation motion parallel to the aforementioned direction of extension "X". Preferably, the movement of the sliding portion 22 inside the guide portion 13 occurs by sliding.

[0027] With reference to figures 1 to 3B, the retaining body 30 is slidable on the guide body 10 along the direction of extension "X" and is operationally arranged on the second side 12 of the guide body 10. In greater detail, the retaining body 30 comprises an adjusting and clamping means 32 adapted to cause a controlled movement and stable positioning of the retaining body 30 along the guide body 10. In particular, according to an aspect of the invention, the guide body 10 has a plurality of transverse openings 15, or preferably through grooves, which substantially define a rack. In other words, the guide body 10 has a series of substantially identical and equidistant transverse seats made along the guide body 10. In accordance with an aspect of the invention, these transverse openings 15 can be made by punching the guide body 10, if the latter is made of metal sheet, or by moulding, if the guide body is made of plastic material.

[0028] With reference to figures 6A to 6C, the adjusting and clamping means 32 of the retaining body 30 comprises a threaded member 33 associated or associable with the rack by means of a respective screw propeller 33a. In greater detail, the threaded member 33 is movable in rotation around a respective axis of rotation "Z", parallel to the direction of extension "X", such that a rotation of the threaded member 33 corresponds to a predetermined translation of the threaded member 33 along the axis of rotation "Z" (and therefore along the direction of extension "X"). According to a further aspect of the invention, the threaded member 33 can advantageously have a head portion provided with an engagement seat for a screwdriver adapted to facilitate the movement of the threaded member 33. Alternatively, or in addition, the threaded member 33 can have a head sized such that it can be grasped with a tool, for example pliers, or by hand by an operator.

[0029] With reference to figures 4A and 4B, should the screw propeller 33a pass through the transverse openings 15, the anchoring body 20 can have a recess 22c in such a way that the screw propeller 33a and the anchoring body 20 do not hinder each other.

[0030] With reference to figure 6B, the retaining body 30 further comprises a containing element 34 for containing the threaded member 33, slidably constrained to the guide body 10 and adapted to maintain the threaded member 33 adhering to the guide body 10. Preferably, the containing element 34 has a pair of coupling fins 34a configured to constrain the containing body 34 to the edge 13 of the guide body 10, allowing it to slide at the same time. In accordance with an aspect of the invention, the retaining body 30 comprises a retaining element 31 configured, in use, to abut against a lower surface of the plane "P". In particular, the retaining element 31 comprises a plate 31a constrained to the threaded member 33 and/or to the containing element 34 and oriented, in use, transversely to the direction of extension "X" to define a shoulder for abutting or coupling against a surface of the plane "P".

[0031] In accordance with a preferred aspect of the invention, the retaining element 31 is constrained to the threaded member 33 in a rotatable way around its axis of rotation "Z" between an engagement configuration, suitable for coupling or stopping against a surface of the plane "P", and a rotated disengagement configuration, suitable for a step of fitting or dismantling the sink "L". In other words, the retaining element 31 can be advantageously rotated in such a way as to limit the encumbrance of the device 1. This feature is particularly advantageous in the operations for laying and installing the sink "L", and in particular in the step of inserting the sink "L" inside the opening of the plane "P". Advantageously, moreover, since the constraint between the retaining element 31 and the threaded member 33 allows a certain play of the retaining element 31, it is easily adaptable to the conformation of the lower surface of the plane "P", especially in the case in which, once installed, the device 1 settles with the direction of extension "X" of the guide body 10 that is not perfectly perpendicular to the ground.

[0032] With reference to figures 1 to 3B, the device 1 comprises an auxiliary retaining element 14, fixed or obtained integrally in an end portion of the guide body 10 and configured to couple, in use, in a respective shoulder "L1" of the lower surface of the sink "L". Advantageously, the auxiliary retaining element 14 provides a stable clamping of the guide body 10 and of the anchoring body 20 to the sink "L". In accordance with an aspect of the invention visible in figures 1 to 3B, the auxiliary retaining element 14 confers an "L" or "C"-shaped termination to the guide body 10. Advantageously, this characteristic allows to at least partially, preferably integrally, discharge the traction force that is exerted by the adjusting and clamping means 32 on the anchoring means 21, preventing the latter from coming out of their respective seats "L2" and therefore avoiding the use of glues and adhe-

sives during the installation of the sink "L". In other words, the auxiliary retaining element 14 works substantially like a harpoon. In still other terms, the auxiliary retaining element 14 can be disengaged in the opposite direction to the direction of the traction force applied by the device 1 on the sink "L". In a further advantageous way and differently from the prior art, it is therefore possible to set an intense clamping force by means of the adjusting and clamping elements 32, improving the fixing of the sink "L" in the opening of the plane "P" without risking the release of the anchoring body 20 from the sink.

[0033] In accordance with a further aspect shown in figures 1 to 3B, the guide body 10 has a spacing portion 16, associated with or obtained in the end portion of the guide body 10 and configured, in use, to abut against a frontal edge of the plane "P". In particular, the spacing element 16 extends away from the second side 12 of the guide body 10 to cause a spacing of the frontal edge of the plane "P" with respect to the second side 12 of the guide body 10. Advantageously, this spacing element 16, by means of the thrust exerted by the front surface of the plane "P", allows to keep the auxiliary retaining element 14 adhering to the shoulder "L1" in the optimal operating position, during the laying and installation operations, and in particular during the operations for clamping the adjusting and clamping means 32. Advantageously, moreover, this spacing element 16 ensures an optimal positioning of the sink "L" inside the opening of the plane "P". By way of example, a possible procedure for fitting a sink "L" by means of one or more fixing devices 1 is now described.

[0034] First of all, the sink "L" is prepared. Subsequently, the expansion plugs 21a are inserted into the respective seats "L2" of the lower surface of the sink "L" and are stably constrained by means of the expanders 21b.

[0035] Subsequently, the sink "L" is housed in the opening of the plane "P". In this step, in order to facilitate the laying operations, the guide body 10 of the one or more devices 1 can be inclined with respect to the sink "L" using the tilt axis "Y". Advantageously, if any, the recall means 22d automatically moves the second component 20b with respect to the first component 20a in such a way as to incline the guide body 10. Furthermore, the retaining member 31 can be switched to the rotated, disengagement configuration.

[0036] Subsequently, the auxiliary retaining element 14 of the one or more devices 1 is engaged in a respective shoulder "L1" of the lower surface of the sink "L" and, by means of the adjusting and clamping means 32, the retaining element 31 is clamped on the lower surface of the plane "P". The present invention also relates to a sink "L" insertable into an opening of a plane "P" and fixable in this opening by means of one or more of the above-described fixing devices 1. In particular, the sink "L" has an upper surface, defining a containment volume, and a lower surface, opposite the upper surface.

[0037] Specifically, the lower surface has at least one receiving seat "L2" adapted to house the anchoring

means 21 and at least one shoulder "L1" adapted to house the auxiliary retaining element 14. In particular, as regards the shoulder "L1", it can be made in one piece with the sink "L" or it can be obtained in a subsequent step, for example by milling.

[0038] The present invention reaches the set objects.

[0039] In fact, a fixing device according to the invention is extremely versatile. Furthermore, thanks to the possibility of moving the anchoring body 20 and the retaining body 30 along the guide body 10, the fixing device according to the invention is able to operate on a wide range of thicknesses of the plane "P" and/or of the sink "L".

[0040] In addition, the fixing device is extremely robust and is able to guarantee a stable fixing of the sink, as well as to facilitate and optimise the operations for laying and installing the sink, especially due to the tilting movement of the guide body 10.

[0041] Furthermore, the auxiliary retaining element 14 ensures a solid and robust constraint of the device 1 to the sink "L". Consequently, the device according to the invention allows to effectively clamp the retaining element 31 on the lower surface of the plane "P", so that the sink "L" adheres perfectly to the plane "P".

Claims

1. A device (1) for fixing a sink (L) in an opening of a plane (P), comprising:

- a guide body (10) having a longitudinal direction of extension (X);
- an anchoring body (20), constrained or constrainable to a first side (11) of said guide body (10) and equipped with an anchoring means (21) configured to permit a stable fixing of the anchoring body (20) to a lower surface of a sink (L);
- a retaining body (30), slidably applied to said guide body (10) along said direction of extension (X) and operationally arranged on a second side (12) of the guide body (10) opposite said first side (11); said retaining body (30) comprising a retaining element (31) configured, in use, to abut against a lower surface of a plane (P); said retaining body (30) further comprising adjusting and clamping means (32) adapted to cause a controlled movement and stable positioning of said retaining body (30) along the guide body (10);

characterized in that said anchoring body (20) has a sliding portion (22) engaged or engageable with a respective guide portion (13) of said guide body (10) such that the position of the anchoring body (20) along the guide body (10) is adjustable.

2. The device (1) according to claim 1, comprising at least one auxiliary retaining element (14), fixed or

obtained integrally in an end portion of said guide body (10) and configured to couple, in use, in a respective shoulder (L1) of a lower surface of a sink (L) so as to make, in cooperation with the anchoring body (20), a permanent clamping of the guide body (10) and of the anchoring body (20) on the sink (L).

3. The device (1) according to claim 2, wherein said at least one auxiliary retaining element (14) gives the guide body (10) an L-shaped or C-shaped or harpoon-shaped end. 10
4. The device (1) according to any one of the preceding claims, wherein the anchoring means (21) of the anchoring body (20) comprises a first component (20a) that is stably applicable to the sink (L) and wherein said sliding portion (22) comprises a second component (20b) slidably applied to the guide body (10); said first and second component (1a, 20b) being reciprocally hinged or hingeable so as to be tiltable around a tilt axis (Y) that is transverse, preferably perpendicular, to said direction of extension (X) of the guide body (10). 15 20
5. The device (1) according to any one of the preceding claims, wherein said sliding portion (22) comprises a sliding slide (22a) and wherein said guide portion (13) is defined by folded edges (13a) of said guide body (10); said folded edges (13a) being parallel to said direction of extension (X) and constraining said sliding slide (22a) in a translation motion parallel to said direction of extension (X). 25 30
6. The device (1) according to any one of the preceding claims, wherein said guide body (10) has a plurality of transverse openings (15) or preferably through grooves, substantially defining a rack and wherein said adjusting and clamping means (32) comprises a threaded member (33) associated or associable with said rack by means of a respective screw propeller (33a); said threaded member (33) being movable in rotation around a respective axis of rotation (Z), parallel to said direction of extension (X), such that a rotation of said threaded member (33) causes a translation of said threaded member (33) along said axis of rotation (Z); said retaining body (30) further comprising an element for containing (34) said threaded member (33), wherein said containing element is slidably constrained on said guide body (10) and adapted to maintain said threaded member (33) adhering to said guide body (10). 35 40 45 50
7. The device (1) according to claim 6, wherein said retaining element (31) comprises a plate (31a) constrained to said threaded member (33) and/or to said containing element (34) and orientated, in use, transversely to said direction of extension (X) to define a shoulder for abutting or coupling against a surface 55

of said plane (P).

8. The device according to claim 7, wherein said retaining element (31) is rotatable around said axis of rotation (Z) between an engagement configuration, suitable for abutting on or couple against a surface of the plane (P), and a rotated disengagement configuration, suitable for a step of fitting or dismantling the sink (L) with respect to the plane (P).
9. The device (1) according to any one of the preceding claims, wherein said guide body (10) has a spacing portion (16) associated with an end portion of said guide body (10) and configured, in use, to abut against a frontal edge of said plane (P); said spacing element (16) extending away from said second side (12) of said guide body (10) to cause a spacing of the frontal edge of the plane (P) with respect to said second side (12) of the guide body (10).
10. The device (1) according to any one of the preceding claims, wherein said anchoring means (21) comprises at least one expansion plug (21a) configured to be inserted into at least one respective receiving seat (L2) obtained in said lower surface of said sink (L); said at least one expansion plug (21a) being configured to house a respective expander (21b) and being preferably integrally obtained with the coupling body (20).
11. The device (1) according to any one of the preceding claims 4 to 10, comprising a recall means (22d) configured to promote a reciprocal movement between said first and said second component (20a, 20b); preferably said recall means (22d) being operationally interposed between said first and said second component (20a, 20b).
12. A sink (L) insertable into an opening of a plane (P) and fixable in said opening by means of a plurality of devices (1) according to any one of the preceding claims 2 to 10, wherein said sink (L) has an upper surface, defining a containment volume, and a lower surface, opposite said upper surface, **characterized in that** said lower surface has at least one receiving seat (L2) adapted to house said anchoring means (21) and at least one shoulder (L1) adapted to house said auxiliary retaining element (14).

Fig.1

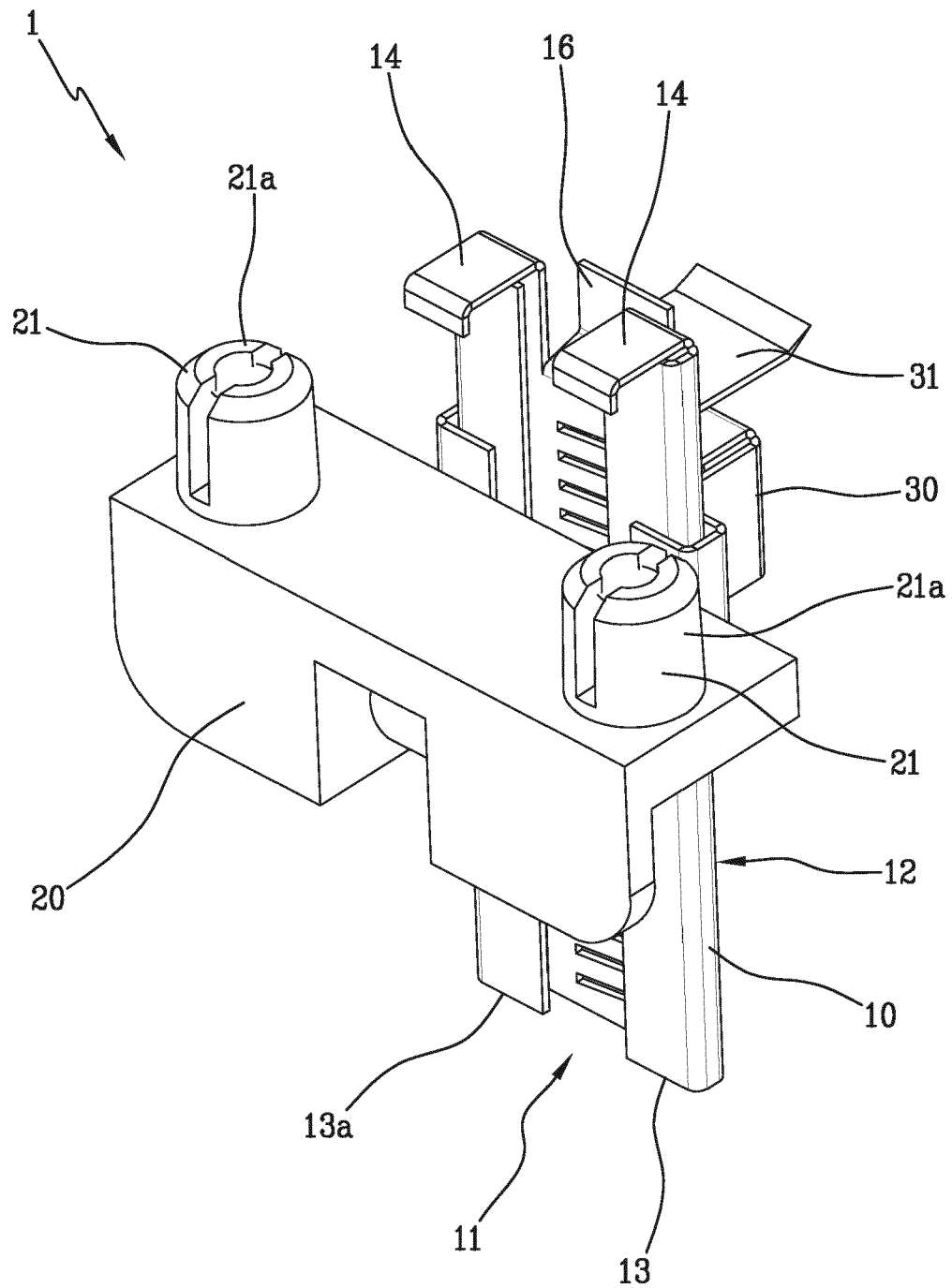


Fig.2

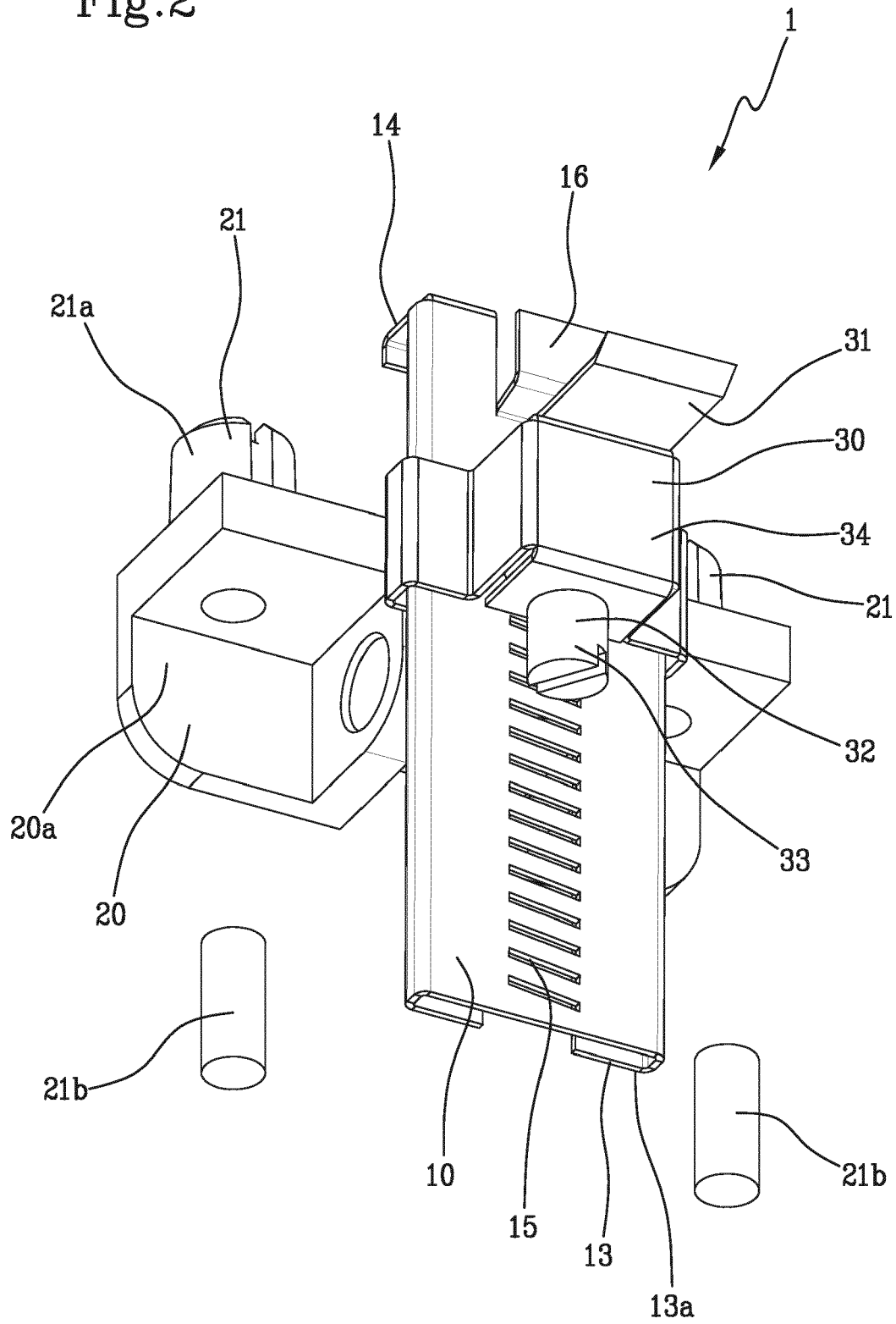


Fig.3A

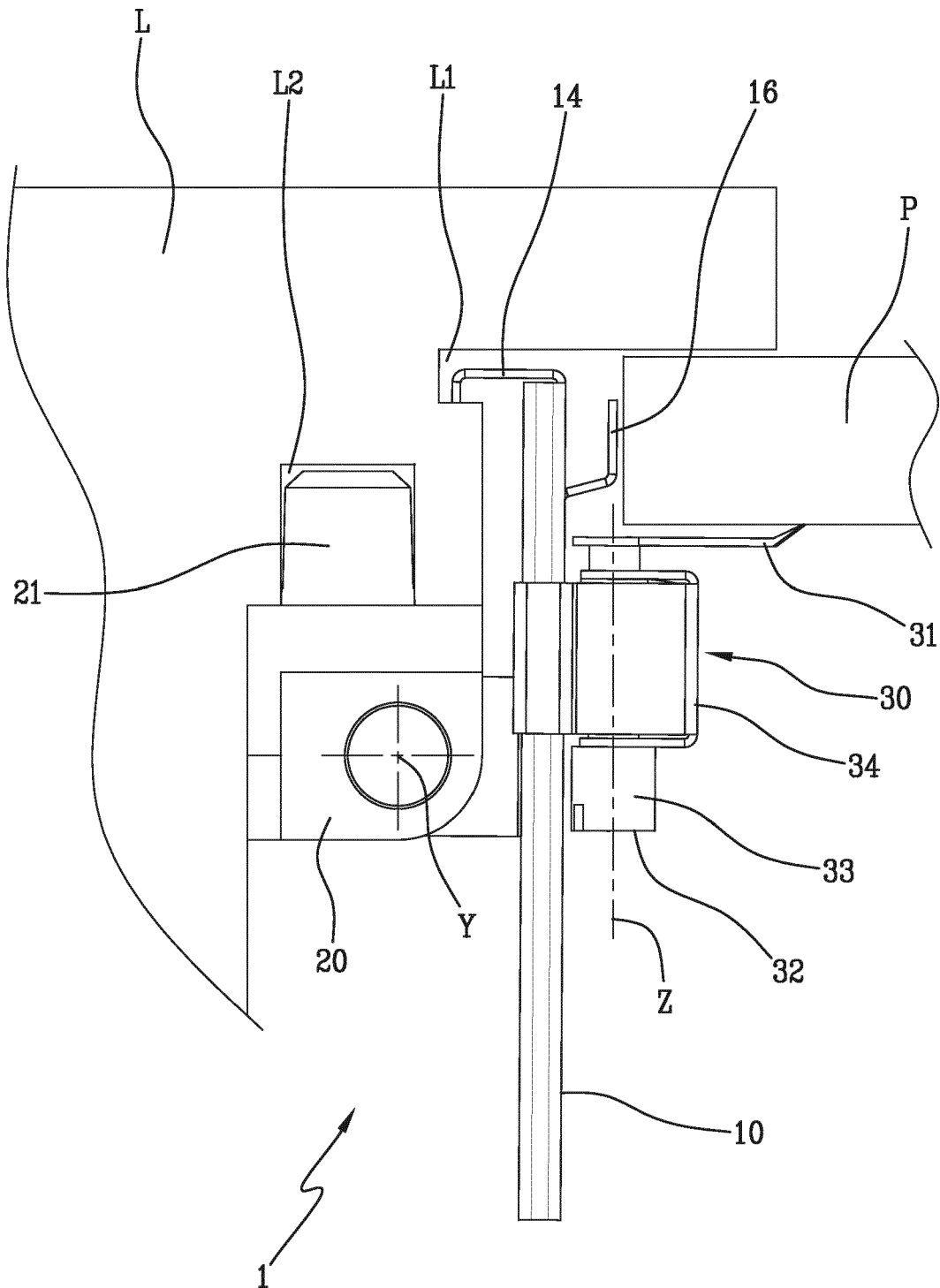
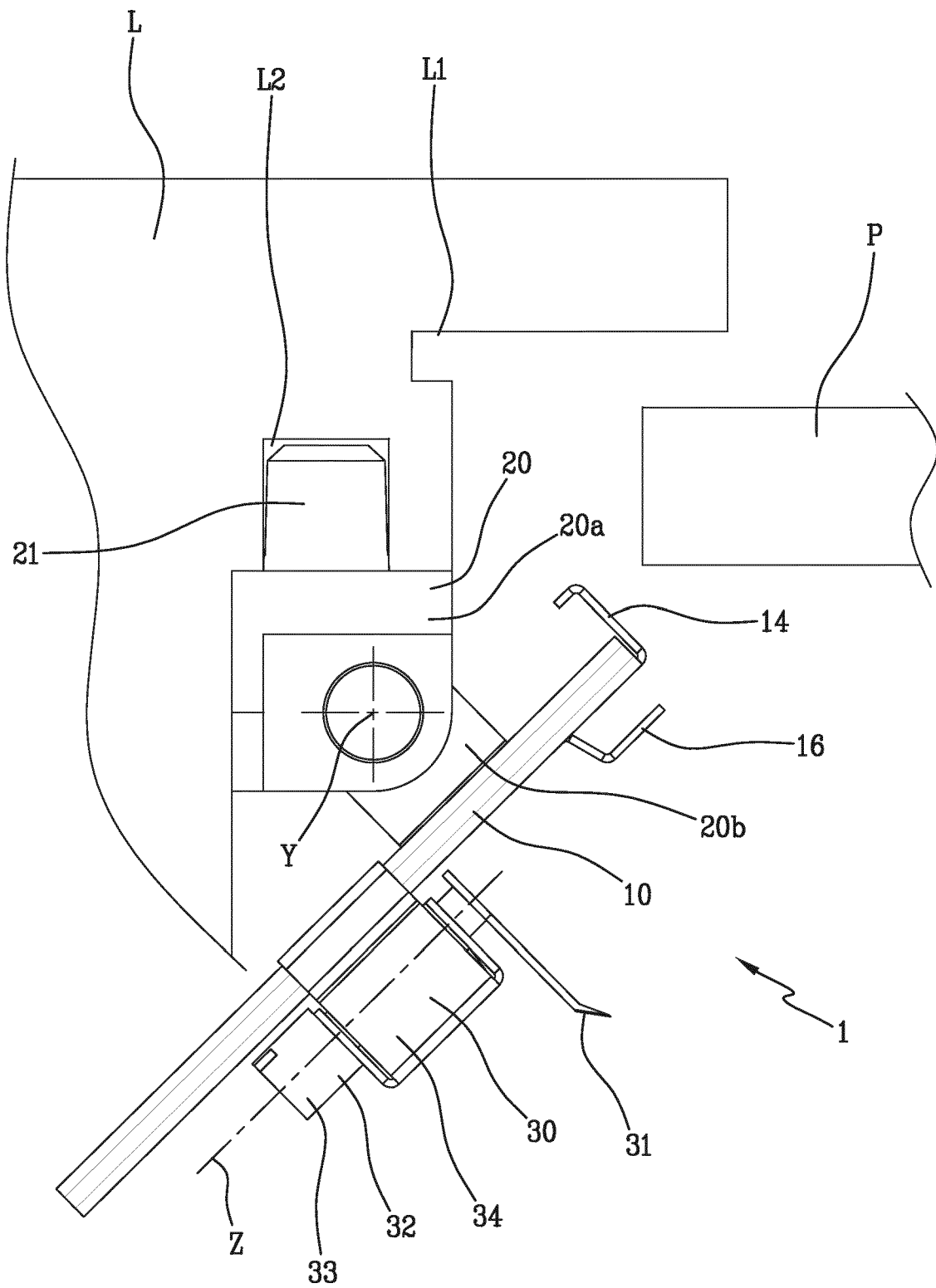


Fig.3B



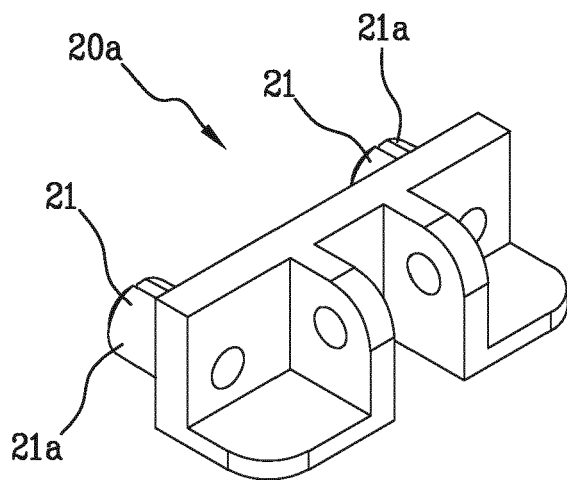


Fig. 4A

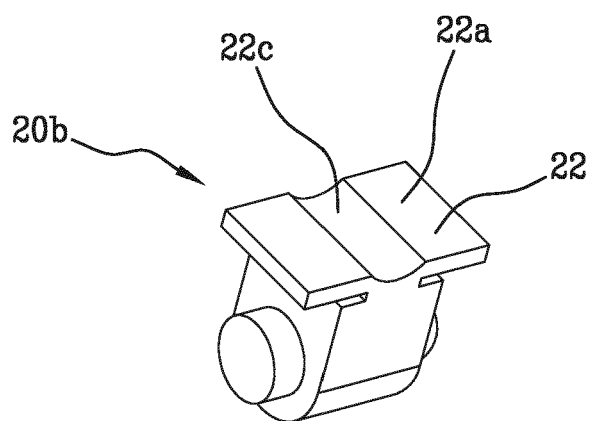


Fig. 4B

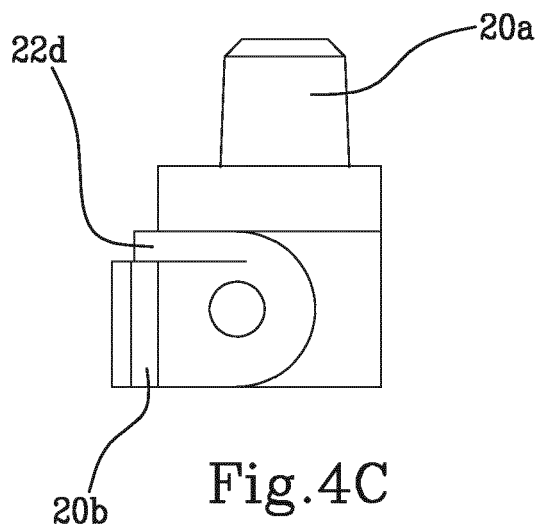


Fig. 4C

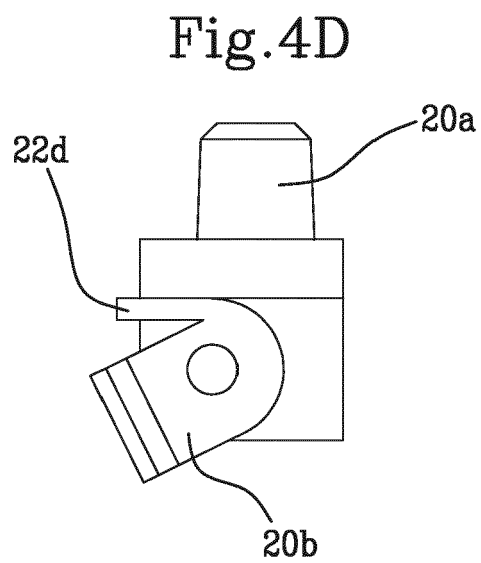


Fig. 4D

Fig.5

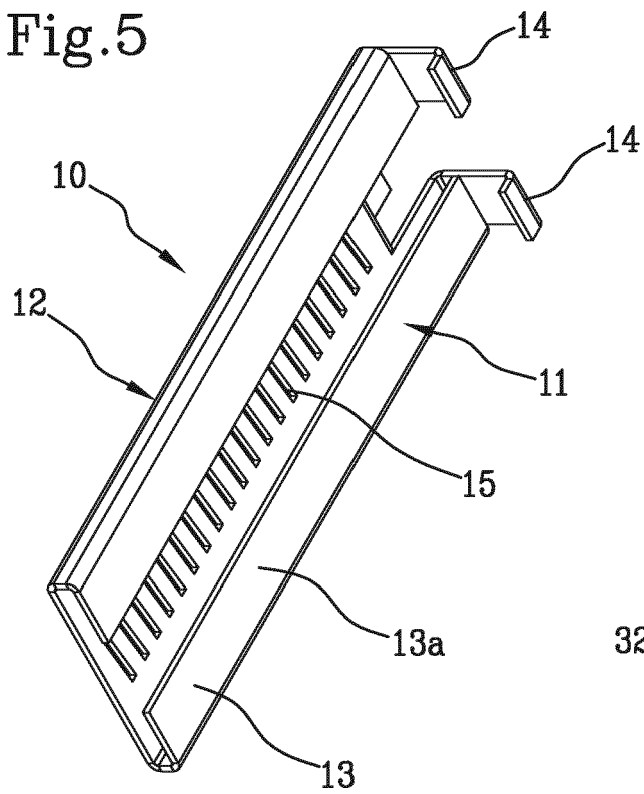


Fig.6A

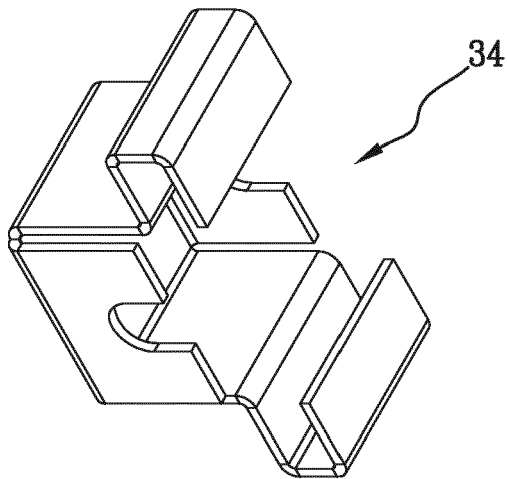
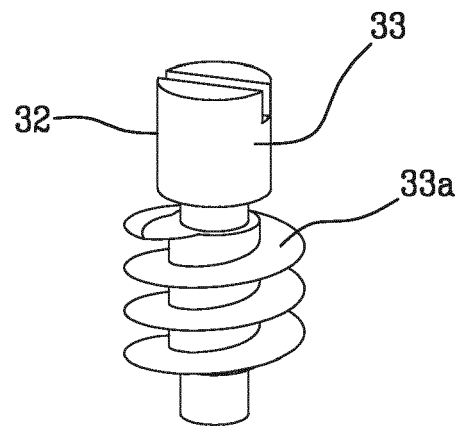


Fig.6B

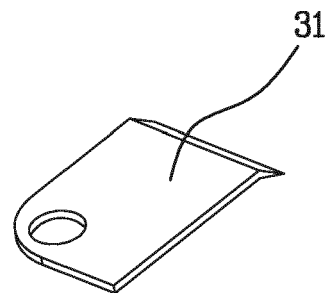


Fig.6C



EUROPEAN SEARCH REPORT

Application Number

EP 22 15 2736

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	ES 2 275 479 T3 (LISI AUTOMOTIVE RAPID; SCHOCK & CO GMBH) 16 June 2007 (2007-06-16)	1, 4, 5, 10, 11	INV. E03C1/33
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