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(54) Supporting arrangement to supporting a luminaire housing

Stützenanordnung zum Stützen eines Leuchtengehäuses

Agencement de support pour soutenir un boîtier de luminaire

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Description

[0001] The present invention relates to a supporting arrangement to support a luminaire housing on a suspended ceiling, comprising resting means formed to align with a member of the suspended ceiling, and attachment means arranged to combine the supporting arrangement with the luminaire housing.

[0002] Suspended ceilings exhibit a variety of benefits, including the possibility to optimize lighting scenarios in a cost efficient way. Customarily a grid structure is attached to a building, covering the ceiling of a room at a distance, forming the base for a plurality of installations. Thus, lighting systems can be readily adapted to various applications by combining luminaires to the grid structure. In many cases it proves to be sufficient to rest the luminaire on the suspended ceiling, thereby creating opportunity to further save costs by refraining from firmly fastening the luminaires to the suspended ceiling or the respective grid structure.

[0003] An arrangement known in the art provides a resting wedge, comprising resilient arms combined together at a common end, forming the tip of the wedge. Said resilient arms include an acute angle, providing both a horizontal resting face in the region of the tip of the wedge, and attachment means to combine with the luminaire at their free ends, opposing the tip.

[0004] Combining said resting wedge to a luminaire requires the wedge to protrude a luminaire housing; starting with its tip, the resting wedge is pushed through a respective aperture of the housing. Brought to an expedient distance the horizontal faces of the wedge provide resting faces to align with the suspended ceiling. At the same time the resilient arms accommodate the housing of the luminaire, actuating the circumference of the aperture. In order to prevent a retraction of the wedge, a locking member is inserted between both free ends of the resilient arms, maintaining the angle included by the resilient arms at a fixed state.

[0005] Evidently the depicted mounting procedure requires the support of the luminaires weight while aligning the luminaire to a final installation position. Since the danger of losing contact to the suspended ceiling is imposed, it is prohibitive to rest the luminaire on the wedges in an unlocked state, as it is required to level the luminaire. Thus, especially for heavy or large luminaire housings an essential effort arises in providing auxiliary personal.

[0006] Moreover access to the interior of the housing is required, resulting in the need to remove a plurality of luminaire components to reach the respective apertures. Following safety guidelines, it is mandatory to assign skilled personal to this task, thus the cost benefit of simplified mechanical mounting to the suspended ceiling is significantly diminished.

[0007] Other supporting arrangements for supporting luminaire housings are known from US 7 588 354 and US 3 710 096.

[0008] Accordingly it is an object of the present inven-

tion to provide a cost efficient supporting arrangement to readily support a luminaire on a suspended ceiling.

[0009] This object is solved by a supporting arrangement according to claim 1. Advantageous modifications of the present invention are subject matter of the dependent claims.

[0010] According to the invention a supporting arrangement for supporting a luminaire housing on a suspended ceiling is provided, comprising resting means formed to align with a suspended ceiling member and attachment means, formed to combine the supporting arrangement with the luminaire housing. Inventively the attachment means are arranged to be varied to a series of positions. Set to a first position, the attachment means are arranged to combine with the luminaire housing or to be removed. Adopting a second position, the attachment means are arranged to accommodate the luminaire housing. In this second position the supporting arrangement remains movable with respect to the luminaire housing, preferably creating opportunity to adjust the vertical position of the luminaire with respect to the suspended ceiling. Regulated to a third position the attachment means are arranged to be locked to the luminaire housing, preventing both retraction of the supporting arrangement and maneuverability of the housing with respect to the support arrangement.

[0011] Preferably the adjustment to different positions is achievable without the usage of tools. Moreover in each of the positions the state of the attachment means is clearly discriminative, implying that functionality provided in one state is absent in another.

[0012] In an advantageous modification the attachment means are arranged to persist in each of the second or third positions. Thus, unintended changes of features or functionality provided by the attachment means associated with a specific position are avoided. Advantageously the usage of tools is likewise obviated for locking positions in a persisting manner.

[0013] In a modified embodiment the attachment means comprise an attachment blade, combined to the supporting arrangement at one end of the blade; arranged oppositely a free end of the blade is preferably provided with a distance from the supporting arrangement. Favorably the blade is formed resiliently in this example embodiment. But it is also conceivable that the attachment blade is arranged jointed. The opposing free end of the attachment blade is arranged to be combined with the luminaire housing.

[0014] An advantageous modification the attachment means comprises two attachment blades combined together at a common end forming the tip of a wedge. The combination of attachment blades includes an acute angle and the horizontal faces of the blades provide in conjunction resting means formed in a virtually triangular shape.

[0015] Fostering the combination of supporting arrangement and luminaire housing, advantageously the attachment means comprise a fitting face, projecting from

the attachment means with an angle, preferably a right angle. In a favorable embodiment the fitting faces are arranged jutting out of an attachment blade with an angle, preferably exhibiting a flat fitting surface. Moreover, it is also conceivable that the fitting face follows the shape of the luminaire housing. A favorable embodiment stipulates fitting faces arranged at or in the range of the free ends of the attachment blades.

[0016] Further improving the concept of fitting faces, the attachment means comprise a plurality of fitting faces, preferably arranged in combination to confine the maneuverability of the supporting arrangement to a plane parallel to the surface of the fitting face or to the luminaire housing. A movement of the supporting arrangement with respect to luminaire housing is favorably enabled in a vertical direction, creating the possibility to level the luminaire flush with the suspended ceiling or to adjust the spatial relations of luminaire and suspended ceiling in a vertical direction as required. Preferably the maneuverability is constrained exclusively to a vertical direction.

[0017] A preferred embodiment stipulates at least two of the fitting faces varying in size. Favorably one of the fitting faces is formed to protrude an aperture, arranged in a housing to accommodate the supporting arrangement. Advantageously the smaller fitting face doesn't exceed the size of this aperture, whereas the more extending fitting face serves as a stopping face to limit maneuverability of the luminaire housing to a plane parallel to the fitting face or the surface of the luminaire housing being in contact with the stopping face.

[0018] Especially advantageous two fitting faces varying in size are arranged in the range of the free end of the attachment blade, wherein the fitting face formed proximate the free end is smaller in size than the more distant fitting face, exhibiting functionality described above.

[0019] Favorably creating the opportunity to pass a fitting face through an aperture of a luminaire housing, preferably a free end of the attachment means is arranged at a minimum distance from the support arrangement defining a reference axis, wherein the minimum distance meets or exceeds the maximum size of a fitting face projecting from the attachment means, when observed in continuation of said reference axis. Advantageously said minimum distance defines margin to actuate the fitting faces or the attachment means; favorably the size of at least one of the fitting faces is within this margin.

[0020] Providing the possibility to arrange a persistent position of the attachment means, said locking member is provided with a locking face arranged to lock the attachment means at said minimum distance. Advantageously the size of the locking face meets the minimum distance.

[0021] A preferred embodiment comprises fitting faces provided with a stepped or tapered face. Mounted to attachment means, preferably to a free end, advantageously to an attachment blade, the possibility arises to define a plurality of locking positions. Since for a stepped

or tapered fitting face said distance to the supporting arrangement can be varied by a stepping or taper, a modified interaction with a locking member meeting the minimum size emerges.

[0022] Advantageously the locking face formed to meet the minimum distance in size is arranged to be moved to a position of modified distance between attachment means and supporting arrangement as hinted above. Therefore the effective distance of attachment means and supporting arrangement is reduced by the dimensions of the locking face.

[0023] In a favorable modification of the invention the supporting arrangement comprises a positioning member, formed to confine the position of the support arrangement with respect to a grid member of the suspended ceiling. Advantageously the positioning member is formed on the resting means, and even more advantageously the positioning member is formed removable from the resting means, providing the opportunity for the resting means to adapt to a variety of suspended ceiling members or grids.

[0024] Readily providing a defined position of the luminaire housing with respect to the suspended ceiling, the positioning member is preferably formed to define a pivot for the support arrangement with respect to the suspended ceiling.

[0025] In a modified embodiment the positioning member is a pin projecting from the supporting arrangement, completing the supporting arrangement to encompass a grid member of the suspended ceiling at least in part.

[0026] A further aspect of the invention is directed to a luminaire arrangement, comprising a luminaire housing and a supporting arrangement, wherein the luminaire is combined to a plurality of supporting arrangements according to the invention.

[0027] The invention also includes methods for mounting a luminaire housing on a suspended ceiling according to claims 11 and 12.

[0028] A method, comprises a supporting arrangement according to the invention and the step of combining a supporting arrangement to a luminaire housing, wherein the housing remains movable with respect to the supporting arrangement, preferably enabling the leveling of the luminaire, as required for the support of the luminaire housing by the supporting arrangement.

[0029] Preferably the supporting arrangement is combined from beyond the luminaire housing. Advantageously it is obviated to gain manual access to the interior of the housing for combining the supporting arrangement to the luminaire housing.

[0030] In a preferred modification of the method, the luminaire comprises a positioning member according to the invention and the step of rotating the luminaire housing around a pivot defined by the positioning member, advantageously to a final supporting position.

[0031] Preferably the method is enhanced by the steps of combining additional supporting arrangements to the luminaire housing, adjusting the level of the luminaire

housing with respect to the suspended ceiling, while the retraction of the supporting arrangement from the luminaire housing is prevented. Subsequently locking the supporting arrangements to the luminaire housing is stipulated.

[0032] In the following, the present invention and preferred embodiments thereof are explained in more detail with respect to the enclosed figure. It is shown in

- Fig. 1 an embodiment of a supporting arrangement according to the invention;
- Fig. 2 a part of a supporting arrangement, being deposited to a luminaire housing;
- Fig. 3 a view of a main part of an embodiment of a supporting arrangement according to the invention;
- Fig. 4 a sketched view an embodiment of fitting faces and their spatial relations;
- Fig. 5 a-c) attachment means arranged in a variety of positions, formed to persist in each position;
- Fig. 6 a-c) a sketch of a method to mount a luminaire to a suspended ceiling according to the invention;
- Fig. 7 a, b) a continuation of the method of figure 6;
- Fig. 8 a-c) a detailed views on the operation of a supporting arrangement according to the invention;
- Fig. 9 a)-c) operation of a positioning member; and
- Fig. 10 prior art embodiment of a supporting arrangement.

[0033] Suspended ceilings provide opportunity to support versatile installations; especially for large lighting systems it is customary to be arranged on an expedient auxiliary structure provided by the suspended ceiling to facilitate alignment and mounting, fostering the overall lighting effect stipulated by lighting design. As it is known in the art, mounting of such a system represents a substantial effort rising the need to facilitate this process.

[0034] A prior art method for combining members of a lighting system to a suspended ceiling can be derived by figure 10. A luminaire housing 500 is deemed to be mounted to suspended ceiling grid 10. Housing 500 comprises an aperture 510 designed to be protruded by a resting wedge 1000. Subsequent to aligning the luminaire housing 500, starting from inside the housing 500, the resting wedge 1000 is fed through aperture 510 until fitting faces 120 arranged on two resilient arms are brought to contact with the luminaire housing 500. The resilient arms form the main body of the wedge 1000 and bridge aperture 510, actuating fitting faces 120. Horizontal faces 1010 at the tip of the wedge 1000 serve as resting means, supporting luminaire housing 500, aligning it with the grid 10. Subsequently to leveling the luminaire, a locking wedge is pushed between the resilient arms, fixing the contact of fitting faces 120 and housing 500 and preventing resilient arms from being actuated.

[0035] This procedure proves to be rather tedious and

awkward, requiring the full weight of the luminaire housing 500 to be supported during the entire installation and leveling period and access to the interior of the luminaire housing 500.

[0036] A supporting arrangement 100 according to the invention is formed to readily support a luminaire housing 500 on a suspended ceiling 10 and to facilitate the process depicted above. The support arrangement 100 comprises resting means formed to align with a suspended ceiling member and attachment means, formed to combine the supporting arrangement 100 with the luminaire housing 500. As will become obvious, avoiding spatial constraints, the resting means are not limited to resting faces. According to the invention a more fixed combination with the ceiling, preferably a clamping combination, is also conceivable.

[0037] According to the invention the attachment means are arranged to be varied to a series of distinct positions, each exhibiting a specific functionality. Set to a first position A, the attachment means are arranged to combine with the luminaire housing 500 or to be removed thereof. Advantageously the combination to the housing 500 can be achieved starting from beyond the housing, avoiding access to the interior. Engaging a second position B, the attachment means are arranged to accommodate the luminaire housing 500 and favorably the supporting arrangement remains movable with respect to the luminaire housing. Resulting in a defined combination of luminaire housing 500 and supporting arrangement 100, the luminaire can be aligned, preferably in a vertical direction, while creating the possibility to put load on the supporting arrangement 100. Adjusted to a third position C, the attachment means are arranged to be locked to the luminaire housing 500, providing a defined spatial relation of luminaire housing 500 and suspended ceiling.

[0038] Preferably the adjustment to the positions obviates the usage of tools.

[0039] Following the description above, each of the positions of attachment means exhibits a specific functionality and characterizes the combination of luminaire housing 500 and supporting arrangement, being relevant for subordinate steps of the combination process. Fostering a swift and reliable usage of the functionality and features, in an advanced embodiment the attachment means are formed to persist in each of the positions B) and C), preferably implying that position A) is reliably adjustable.

[0040] A removable locking member 200, is arranged for providing the persisting of the positions B) and C).

[0041] An example embodiment of the inventive supporting arrangement formed wedge-like is depicted in figure 1.

[0042] The attachment means comprise an attachment blade 110a, combined to the supporting arrangement at one end of the blade 110a, wherein the blade 110a is preferably arranged resiliently. But it is also conceivable that the attachment blade 110a is jointed to the supporting arrangement 100, advantageously a spring

bias can be stipulated.

[0043] Preferably the attachment blade 110a is arranged to actuate the circumference of an aperture 510 formed in the luminaire housing 500, to accommodate the supporting arrangement 100.

[0044] In the embodiment of figure 1 the free end of the attachment blade 110a is arranged at a minimum distance D1 to the supporting arrangement, contributing to a triangular shape of the wedge. Favorably distance D1 is sufficient to bridge aperture 510 at least in one dimension.

[0045] Fostering the combination of attachment means and luminaire housing 500 the attachment means comprise a fitting face 120a, 120b, 130 projecting from the attachment means with an angle, preferably a right angle. Moreover, it is also conceivable to adapt the angle to the surface of a luminaire housing 500, creating opportunity to align the fitting faces with the luminaire housing 500.

[0046] Preferably the attachment means comprise a plurality of fitting faces 120a, 120b arranged to constrain the maneuverability of the supporting arrangement 100 to a plane with respect to the luminaire housing 500.

[0047] Example embodiment of figure 1 comprises two attachment blades 110a and 110b, combined together at one common end forming the tip of a wedge. A triangular, wedge-like shape of the supporting structure results of attachment blades including an acute angle. Horizontal faces of preferably chevron-like formed attachment blades 110a and 110b are arranged as resting means. Advantageously each attachment blade 110a, 110b is arranged to actuate the circumference of the aperture 510 and provided with a fitting face 120a and 120b at a free end of the blade. The fitting faces 120a, 120b jut out of the free end at an angle, forming a hook like structure arranged to cooperate with the housing of the luminaire 500.

[0048] Fitting faces 120a and 120b as outlined in this modification of the invention are generally flat polygons, preferably adapting to the shape of the luminaire housing 500. Beyond the depicted virtually rectangular shape comprising a stepped circumference, a rounded, square, or triangular shape is also conceivable including arched variations thereof.

[0049] Attachment blade 110a comprises a second fitting face 130, arranged at an expedient distance to fitting face 120a, formed to accommodate a wall of the luminaire housing 500 between fitting faces 120a and 130. Thus the maneuverability of the luminaire housing 500 is constrained to a plane parallel to the fitting faces. Moreover, in a modification - especially for more sophisticated fitting faces - it is favorable that the respective circumferences of fitting faces are arranged parallel to each other, at the sides facing the luminaire housing 500, fostering maneuverability of the housing.

[0050] In an advantageous embodiment at least two of the fitting faces 120a and 130 vary in size, providing the possibility for the more extending fitting face 130 to serve as a stopping face. Advantageously arranged at

the free end of attachment blade 110a the smaller fitting face 110a virtually meets the size of an opening 510 arranged in the luminaire housing 500.

[0051] As can be gathered from figure 2, to accommodate luminaire housing 500 attachment face 120b is wiggled through aperture 510 of the housing. Although fitting face 120b exceeds the size of aperture 510 in lateral direction, an insertion of blade 110a can be achieved by aligning the aperture 510 along the hook like structure defined by the protrusion angle of attachment means and fitting faces. As a result of its lateral dimension L3 (figure 3) exceeding the size of opening 510, fitting face 120b prevents supporting arrangement 100 from being retracted, when firmly aligned with the luminaire housing 500.

[0052] Evidently, aligning fitting face 120b in the depicted manner prohibits the fitting faces 120a and 130 from being wiggled through aperture 510 similarly. Benefiting from the expedient small size of fitting face 120a a possibility is created to align fitting face 120a while fitting face 120b remains aligned.

[0053] In a preferred modification attachment blade 110a - as an example for attachment means - is arranged at a minimum distance D1 (figure 1) from the support arrangement 100. This minimum distance D1 - in this example represented by the geometrical projection of attachment blade 120a to the supporting arrangement 100 - defines a reference axis, wherein the minimum distance D1 meets or exceeds the maximum size of a fitting face 120a projecting from the attachment means, when observed in continuation of that reference axis. In this way distance D1 establishes a margin to guide fitting face 120a through opening 510.

[0054] Figure 4 clarifies this setup. Fitting face 120a formed at the free end of attachment blade 110a is arranged at a minimum distance from fitting face 120b, wherein this minimum distance is identical to the minimum distance D1 as defined above. Lateral or horizontal extension L1 of fitting face 120a is formed to meet or undershoot the distance D1, favorably being within the margin to be passed through aperture 510.

[0055] Advantageously the minimum width W1 of opening 510 meets or exceeds the lateral extension L1 of fitting face 120a.

[0056] Following the embodiment of figure 3, likewise arranged at the free end of attachment blade 110a at an expedient distance to fitting face 120a, the lateral dimension L2 of fitting face 130 exceeds the lateral dimension L1 of fitting face 120a. Therefore fitting face 130 is formed as a stopping face, limiting the feed of attachment blade 110a through aperture 510.

[0057] Moreover, the distance of fitting face 130 to fitting face 120a is advantageously in the range of the thickness of a wall of the luminaire housing 500, to be accommodated by the supporting arrangement 100.

[0058] Following the example embodiment of figure 1, fitting face 120b is guided through aperture 510 from beyond the housing 500 and brought to contact with a wall of housing 500. Actuating attachment blade 110a to-

wards attachment blade 110b, nullifying the minimum distance D1, provides a margin of likewise extent to pass fitting face 120a through aperture 510. Fitting face 130 is arranged to provide a stopping face for the feed of attachment blade 110a through aperture 510 and to accommodate in combination with fitting face 120a a wall of the luminaire housing 510, constraining maneuverability of the luminaire housing 500 to a plane defined by the fitting faces. This situation is depicted in figure 6a, hinting the possibility to adjust the level of the luminaire housing with respect to the supporting arrangement by arrows in figure 6b. As can be derived, in providing an oblong aperture 510 a preference direction within said plane can be defined, limiting said maneuverability to this preference direction. Advantageously the oblong aperture 510 is arranged in a vertical direction enabling the leveling of the luminaire housing 500. Furthermore, the aperture 510 is preferably provided with corrugations to define a set of latching positions, arranged to be actuated by the attachment means.

[0059] With attachment means being in the depicted configuration, it is also conceivable to remove the supporting arrangement, representing attachment means being in a position A. According to the invention it is stipulated that second and third positions B and C are arranged, being discriminative in their functionality.

[0060] This is realized by a removable locking member 200. Referring to figure 3, attachment blades 110a and 110b comprise guiding means 170 for the removable locking member 200, in the depicted embodiment a guiding rail protruding from the attachment means.

[0061] The locking member 200 comprises likewise guiding means 270 - in the depicted case a guiding channel (figure 5a) - arranged to mate with guiding means 170 (figure 3) - and also a locking face 220, formed to meet the dimensions of minimum distance D1. Actuating the locking member 200 as depicted in figure 5c and arranging the locking face 220 at a position of minimum distance D1, prevents the attachment blades 110a, 120a from being actuated towards each other, and thus the fitting faces 120a, 120b and 130 are in firm contact with the luminaire housing 510. Furthermore the margin resulting from the minimum distance D1 to guide fitting face 120a through aperture 510 is prevented from being accessed, thus the housing 510 is locked to the supporting arrangement, proving the retraction of the supporting arrangement impossible, representing a third position of attachment means C according to the invention.

[0062] A second position B of attachment means in this embodiment is arranged by expediently formed fitting faces 120a, 120b, 130 and attachment blades 110a and 110b. Fitting faces 120a, 120b, 130 and attachment blades 110a and 110b are arranged in part with a stepped circumference, altering the distance between attachment means or fitting faces to a distance D2 exceeding the distance D1. Arranging locking faces 220 in the range of the distance D2 as shown in figure 5b, provides a distance D2-D1 to actuate the attachment means, requiring

this distance to be smaller than D1 or size L1 to gain headroom for actuating attachment means. Benefiting from this headroom D2-D1, the firm contact or locking of attachment means to the luminaire housing 510 can be overcome, to enable an adjustment of the position. Owing to the fact that headroom D2-D1 is smaller than L1 or preferably D1, the supporting arrangement is prevented from being removed from the luminaire housing 510.

[0063] Outlined functionality of the supporting arrangement 100 proves a combination of the luminaire to the suspended ceiling as readily achievable. Figures 6 to 8 clarify a preferred method.

[0064] An aspect of the invention stipulates combining a supporting arrangement 100 to a luminaire housing 500 from beyond the housing 500, as hinted in figure 6a.

Favorably the possibility is raised to support the housing of the luminaire 500 on a suspended ceiling, without access to the interior of the housing.

[0065] Combining the supporting arrangement 100 according to the invention is depicted in figure 6a and follows the description for attachment means in position A outlined above.

[0066] Subsequent setting of attachment means to position B as depicted in figure 6b, provides the luminaire housing 510 with the possibility to remain movable with respect to the supporting arrangement 100, obviating to gain manual access to the interior of the housing, creating opportunity to level the housing as required. Simultaneously a retraction of the supporting arrangement is prevented and thus, load can be applied to the supporting arrangement 100, as hinted by figure 6c.

[0067] Advantageously the supporting arrangement is provided with a positioning member 140, formed to confine the position of the support arrangement 100 with respect to a grid member of the suspended ceiling, favorably modified to define a pivot for the support arrangement 100 with respect to the suspended ceiling.

[0068] Preferred embodiment of figure 1, outlines the positioning member 140 as a pin projecting from the supporting arrangement, arranged in a manner, to encompass in combination with the support arrangement 100 a grid member of the suspended ceiling at least in part. Chevron-like attachment blades are formed to encompass a T-bar of a suspended ceiling grid form two sides, where as the pin completes the third side.

[0069] In this embodiment compatibility to a variety of ceiling grid structures is provided, sketched in figures 9a)-c) as an example, comprising double T-bar, omega-T-bars.

[0070] As can also be gathered the positioning member 140 is arranged to provide a stopping face for either pulling the luminaire housing 500 from the T-bar or pushing it too far. Moreover, for incompatible ceiling grid structures a removal of the positioning pin 140 is also conceivable. Possibly this can be facilitated by cutting at predetermined cutting points.

[0071] Fostering a swift alignment a preferred method as sketched in figures 6c, 8a and 8b comprises a posi-

tioning member 140 rotating the luminaire housing 500 around a pivot defined by the positioning member 140 to a final supporting position. Favorably this is enabled by the possibility to bear load the supporting arrangement, adjusting attachment means to position B. Thus the weight of the luminaire housing 500 is deviated partly to the ceiling grid 10, supporting the full luminaire weight while adjusting level and alignment is effectively obviated.

[0072] A further modification to the method comprises the steps of combining additional supporting arrangements 100 to the luminaire housing 500 as hinted in figure 7a, adjusting the level of the luminaire housing 500 with respect to the suspended ceiling, while maintaining the attachment means in position B and locking the supporting arrangements to the luminaire housing 500 by subsequently adjusting position C as shown in figure 7c.

[0073] The locking is achieved by engaging a locking member arranged beyond the housing of the luminaire 500, obviating access to the interior of the housing, depicted in detail in figure 8c.

[0074] Evidently the inventive supporting arrangement, the inventive luminaire arrangement, and the inventive method significantly reduce effort to support a luminaire housing 500 on a suspended ceiling.

Claims

1. Supporting arrangement (100) for supporting a luminaire housing (500) on a suspended ceiling, comprising resting means formed to align with a suspended ceiling member, attachment means, formed to combine the supporting arrangement (100) with the luminaire housing (500), wherein the attachment means are arranged to be varied to

A) a position wherein the attachment means are arranged to combine with the luminaire housing (500) or to be removed,

B) a position wherein the attachment means are arranged to accommodate the luminaire housing (500) and the supporting arrangement remains movable with respect to the luminaire housing, and

C) a position wherein the attachment means are arranged to be locked to the luminaire housing (500),

wherein the attachment means are arranged to persist in each of the positions B) and C), and wherein the persisting of the positions B) and C) is provided by a removable locking member (200),

characterized in that

being combined to the supporting arrangement, the locking member is arranged at a position corresponding to a position beyond the interior of the lu-

minaire housing, obviating access to the interior of the luminaire housing (500).

2. Supporting arrangement according to claim 1, **characterized in that** the attachment means comprise an attachment blade (110a, 110b), combined to the supporting arrangement at one end of the blade (110a, 110b), wherein the blade (110a, 110b) is preferably arranged resiliently.
3. Supporting arrangement according to one of the preceding claims, **characterized in that** the attachment means comprise a fitting face (120a, 120b, 130), projecting from the attachment means with an angle, preferably a right angle.
4. Supporting arrangement according to claim 3, **characterized in that** the attachment means comprise a plurality of fitting faces (120a, 120b), arranged in combination to limit the maneuverability of the supporting arrangement (100) to a plane with respect to the luminaire housing 500.
5. Supporting arrangement according to claim 4, **characterized in that** at least two of the fitting faces (120a, 130) vary in size.
6. Supporting arrangement according to any of the claims 3 to 5, **characterized in that** a free end of the attachment means is arranged at a minimum distance (D1) from the support arrangement defining a reference axis, wherein the minimum distance (D1) meets or exceeds the maximum size (L1) of a fitting face (120a) projecting from the attachment means, when observed in continuation of that reference axis.
7. Supporting arrangement according to claim 6, **characterized in that** a locking member (200) is provided with a locking face (220) arranged to lock the attachment means at the minimum distance (D1).
8. Supporting arrangement according to any of the preceding claims, **characterized in that** the supporting arrangement (100) comprises a positioning member (140), formed to confine the position of the support arrangement (100) with respect to a grid member of the suspended ceiling.
9. Supporting arrangement according to claim 8, **characterized in that**

the positioning member (140) is formed to define a pivot for the support arrangement with respect to the suspended ceiling, preferably the positioning member is a pin projecting from the supporting arrangement (100), arranged to encompass in conjunction with the support arrangement (100) a grid member of the suspended ceiling at least in part.

10. Luminaire arrangement, comprising a luminaire housing (500) and a plurality of supporting arrangements (100) according to one of the preceding claims.
11. Method for mounting a luminaire housing (500) to a suspended ceiling, wherein the luminaire housing (500) is combined to a plurality of supporting arrangements (100) and the luminaire housing (500) is supported on a suspended ceiling with said plurality of supporting arrangements (100), **characterized in that**, said supporting arrangements (100) are combined to the luminaire housing (500) from beyond the housing (500), wherein a removable locking member (200) is arranged at a position corresponding to a position beyond the interior of the luminaire housing (500) for locking the supporting arrangements (100) to the luminaire housing (500), obviating access to the interior of the luminaire housing (500).
12. Method for mounting a luminaire housing (500) to a suspended ceiling, wherein the luminaire housing (500) is combined to a plurality of supporting arrangements (100) and the luminaire housing (500) is supported on a suspended ceiling with said plurality of supporting arrangements (100), **characterized in that** supporting arrangements (100) according to one of the preceding claims 1 to 9 are used.

Patentansprüche

1. Trageanordnung (100) zum Tragen eines Leuchtengehäuses (500) auf einer Zwischendecke, umfassend Ruhemittel, die gebildet sind, um mit einem Zwischendeckenelement auszufluchten, Befestigungsmittel, die gebildet sind, um die Trageanordnung (100) mit dem Leuchtengehäuse (500) zu kombinieren, wobei die Befestigungsmittel so angeordnet sind, um zu variieren in

A) eine Position, in der die Befestigungsmittel angeordnet sind, um mit dem Leuchtengehäuse (500) zu kombinieren oder entfernt zu werden, B) eine Position, in der die Befestigungsmittel angeordnet sind, um das Leuchtengehäuse

(500) aufzunehmen, und die Trageanordnung mit Bezug auf das Leuchtengehäuse beweglich bleibt, und C) eine Position, in der die Befestigungsmittel angeordnet sind, um auf das Leuchtengehäuse (500) verriegelt zu werden,

wobei die Befestigungsmittel angeordnet sind, um in jeder der Positionen B) und C) zu verbleiben, und wobei das Verbleiben der Positionen B) und C) durch ein entfernbares Verriegelungselement (200) bereitgestellt ist,

dadurch gekennzeichnet, dass

durch die Kombination mit dem Trageelement das Verriegelungselement an einer Position angeordnet ist, die einer Position über das Innere des Leuchtengehäuses hinaus entspricht, die den Zugang zum Äußeren des Leuchtengehäuses (500) vermeidet.

2. Trageanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass**

die Befestigungsmittel ein Befestigungsblatt (110a, 110b) umfassen, das mit der Trageanordnung an einem Ende des Blatts (110a, 110b) kombiniert ist, wobei das Blatt (110a, 110b) vorzugsweise elastisch angeordnet ist.

3. Trageanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Befestigungsmittel eine Passfläche (120a, 120b, 130) umfassen, die von den Befestigungsmitteln in einem Winkel, vorzugsweise einem rechten Winkel, vorspringt.

4. Trageanordnung nach Anspruch 3, **dadurch gekennzeichnet, dass**

die Befestigungsmittel eine Vielzahl von Passflächen (120a, 120b) umfassen, die in Kombination angeordnet sind, um die Manövrierfähigkeit der Trageanordnung (100) auf eine Ebene mit Bezug auf das Leuchtengehäuse 500 zu begrenzen.

5. Trageanordnung nach Anspruch 4, **dadurch gekennzeichnet, dass** mindestens zwei der Passflächen (120a, 130) in der Größe variieren.

6. Trageanordnung nach einem der Ansprüche 3 bis 5, **dadurch gekennzeichnet, dass**

ein freies Ende der Befestigungsmittel in einem minimalen Abstand (D1) von der Trageanordnung, die eine Bezugsachse definiert, angeordnet ist, wobei der minimale Abstand (D1) die maximale Größe (L1) einer Passfläche (120a) erreicht oder übersteigt, die von den Befestigungsmitteln vorspringt, wenn sie in der Fortsetzung dieser Bezugsachse betrachtet wird.

7. Trageanordnung nach Anspruch 6, **dadurch ge-**

kennzeichnet, dass

ein Verriegelungselement (200) mit einer Verriegelungsfläche (220) ausgestattet ist, die angeordnet ist, um die Befestigungsmittel im minimalen Abstand (D1) zu verriegeln.

8. Trageanordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Trageanordnung (100) ein Positionierungselement (140) umfasst, das gebildet ist, um die Position der Trageanordnung (100) mit Bezug auf ein Gitterelement der Zwischendecke einzuschränken. 10
9. Trageanordnung nach Anspruch 8, **dadurch gekennzeichnet, dass** das Positionierungselement (140) gebildet ist, um einen Drehpunkt für die Trageanordnung mit Bezug auf die Zwischendecke zu definieren, vorzugsweise das Positionierungselement ein Stift ist, der aus der Trageanordnung (100) vorspringt, angeordnet, um in Verbindung mit der Trageanordnung (100) ein Gitterelement der Zwischendecke mindestens teilweise zu umfassen. 20
10. Leuchtenanordnung, 25
umfassend ein Leuchtengehäuse (500) und eine Vielzahl von Trageanordnungen (100) nach einem der vorhergehenden Ansprüche.
11. Verfahren zum Montieren eines Leuchtengehäuses (500) an eine Zwischendecke, wobei das Leuchtengehäuse (500) mit einer Vielzahl von Trageanordnungen (100) kombiniert ist und das Leuchtengehäuse (500) auf einer Zwischendecke mit der Vielzahl von Trageanordnungen (100) getragen wird, **dadurch gekennzeichnet, dass** 30
die Trageanordnungen (100) mit dem Leuchtengehäuse (500), von über das Gehäuse (500) hinaus kombiniert sind, wobei ein entfernbares Verriegelungselement (200) an einer Position angeordnet ist, die einer Position über das Innere des Leuchtengehäuses (500) hinaus entspricht, um die Trageanordnungen (100) auf das Leuchtengehäuse (500) zu verriegeln und den Zugang zum Inneren des Leuchtengehäuses (500) zu vermeiden. 35
40
45
12. Verfahren zum Montieren eines Leuchtengehäuses (500) an eine Zwischendecke, wobei das Leuchtengehäuse (500) mit einer Vielzahl von Trageanordnungen (100) kombiniert ist und das Leuchtengehäuse (500) auf einer Zwischendecke mit der Vielzahl von Trageanordnungen (100) getragen wird, **dadurch gekennzeichnet, dass** 50
Trageanordnungen (100) nach einem der vorhergehenden Ansprüche 1 bis 9 verwendet werden. 55

Revendications

1. Agencement de support (100) pour supporter un boîtier de luminaire (500) sur un plafond suspendu, comprenant des moyens d'appui formés pour s'aligner avec un élément de plafond suspendu, des moyens de fixation formés pour combiner l'agencement de support (100) avec le boîtier de luminaire (500), dans lequel les moyens de fixation sont agencés pour être modifiés selon : 5

A) une position dans laquelle les moyens de fixation sont agencés pour se combiner avec le boîtier de luminaire (500) ou être retirés,

B) une position dans laquelle les moyens de fixation sont agencés pour loger le boîtier de luminaire (500) et l'agencement de support reste mobile par rapport au boîtier de luminaire, et

C) une position dans laquelle les moyens de fixation sont agencés pour être verrouillés sur le boîtier de luminaire (500), 10

dans lequel les moyens de fixation sont agencés pour persister dans chacune des positions B) et C), et

dans lequel la persistance des positions B) et C) est prévue par un élément de verrouillage (200) amovible,

caractérisé en ce que :

étant combiné avec l'agencement de support, l'élément de verrouillage est agencé dans une position correspondant à une position au-delà de l'intérieur du boîtier de luminaire, rendant inutile l'accès à l'intérieur du boîtier de luminaire (500). 35

2. Agencement de support selon la revendication 1, **caractérisé en ce que :** 40

les moyens de fixation comprennent une lame de fixation (110a, 110b), combinée à l'agencement de support au niveau d'une extrémité de la lame (110a, 110b), dans lequel la lame (110a, 110b) est de préférence agencée de manière résiliente. 45

3. Agencement de support selon l'une des revendications précédentes, **caractérisé en ce que :** 50

les moyens de fixation comprennent une face de montage (120a, 120b, 130) faisant saillie des moyens de fixation avec un angle, de préférence un angle droit. 55

4. Agencement de support selon la revendication 3, **ca-**

caractérisé en ce que :

les moyens de fixation comprennent une pluralité de faces de montage (120a, 120b), agencés en combinaison pour limiter la manoeuvrabilité de l'agencement de support (100) sur un plan par rapport au boîtier de luminaire (500).

5. Agencement de support selon la revendication 4, **caractérisé en ce que :**

au moins deux des faces de montage (120a, 130) varient du point de vue de la taille.

6. Agencement de support selon l'une quelconque des revendications 3 à 5, **caractérisé en ce que :**

une extrémité libre des moyens de fixation est agencée à une distance minimum (D1) de l'agencement de support définissant un axe de référence, dans lequel la distance minimum (D1) rencontre ou dépasse la taille maximum (L1) d'une face de montage (120a) faisant saillie des moyens de fixation, lorsqu'on l'observe en continuité de cet axe de référence.

7. Agencement de support selon la revendication 6, **caractérisé en ce que :**

un élément de verrouillage (200) est prévu avec une face de verrouillage (220) agencée pour verrouiller les moyens de fixation à la distance minimum (D1).

8. Agencement de support selon l'une quelconque des revendications précédentes, **caractérisé en ce que :**

l'agencement de support (100) comprend un élément de positionnement (140), formé pour confiner la position de l'agencement de support (100) par rapport à un élément de grille du plafond suspendu.

9. Agencement de support selon la revendication 8, **caractérisé en ce que :**

l'élément de positionnement (140) est formé pour définir un pivot pour l'agencement de support par rapport au plafond suspendu, de préférence l'élément de positionnement est une broche faisant saillie de l'agencement de support (100), agencé pour comprendre conjointement avec l'agencement de support (100), un élément de grille du plafond suspendu, au moins en partie.

10. Agencement de luminaire, comprenant un boîtier de luminaire (500) et une pluralité d'agencements de support (100) selon l'une des revendications précédentes.

11. Procédé pour monter un boîtier de luminaire (500) sur un plafond suspendu, dans lequel le boîtier de luminaire (500) est combiné à une pluralité d'agencements de support (100) et le boîtier de luminaire (500) est supporté sur un plafond suspendu avec ladite pluralité d'agencements de support (100), **caractérisé en ce que :**

lesdits agencements de support (100) sont combinés au boîtier de luminaire (500) au-delà du boîtier (500), dans lequel un élément de verrouillage (200) amovible est agencé dans une position correspondant à une position au-delà de l'intérieur du boîtier de luminaire (500) pour verrouiller les agencements de support (100) sur le boîtier de luminaire (500), rendant inutile l'accès à l'intérieur du boîtier de luminaire (500).

12. Procédé pour monter un boîtier de luminaire (500) sur un plafond suspendu, dans lequel le boîtier de luminaire (500) est combiné à une pluralité d'agencements de support (100) et le boîtier de luminaire (500) est supporté sur un plafond suspendu avec ladite pluralité d'agencements de support (100), **caractérisé en ce que :**

on utilise des agencements de support (100) selon l'une des revendications 1 à 9.

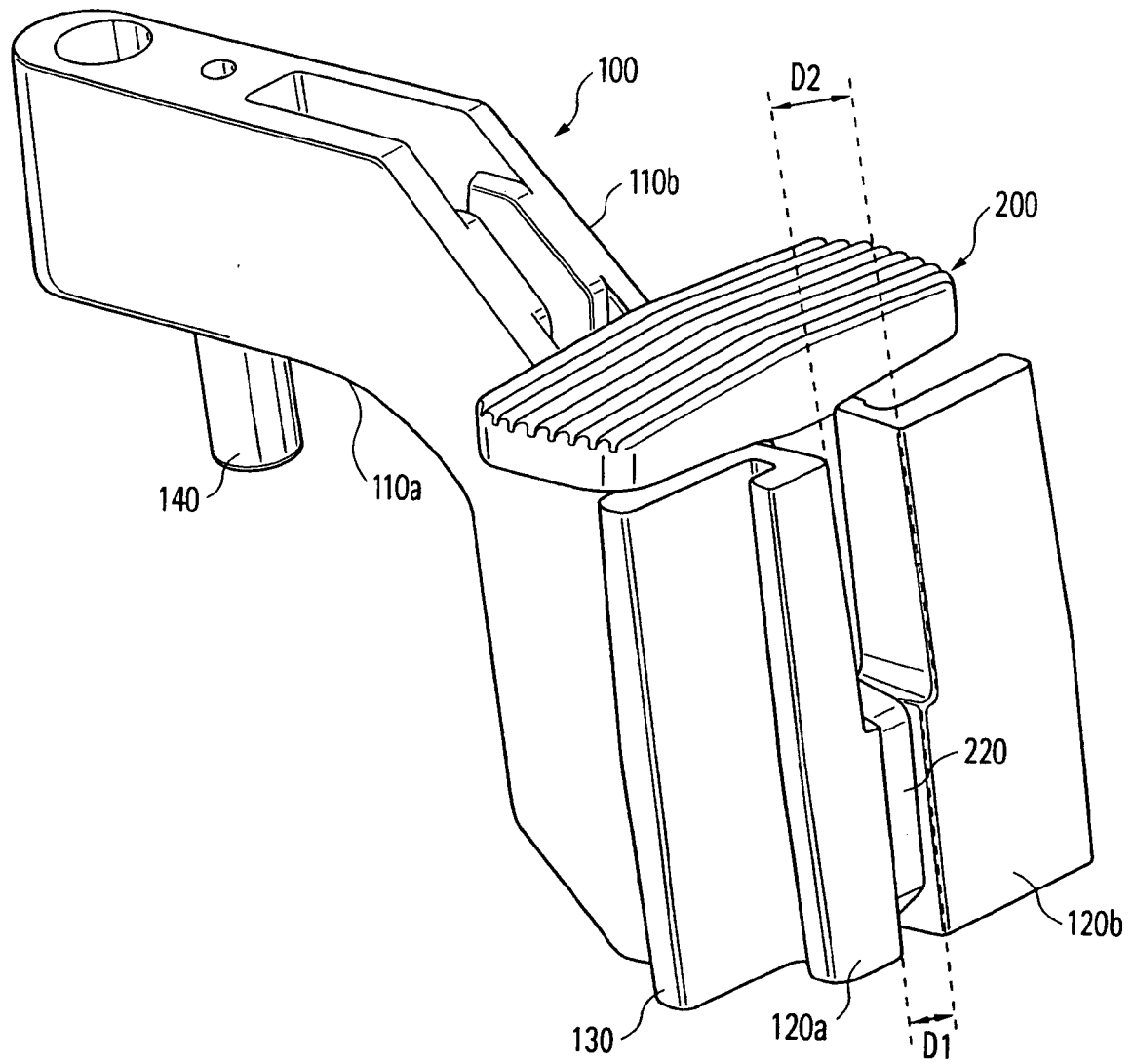


Fig. 1

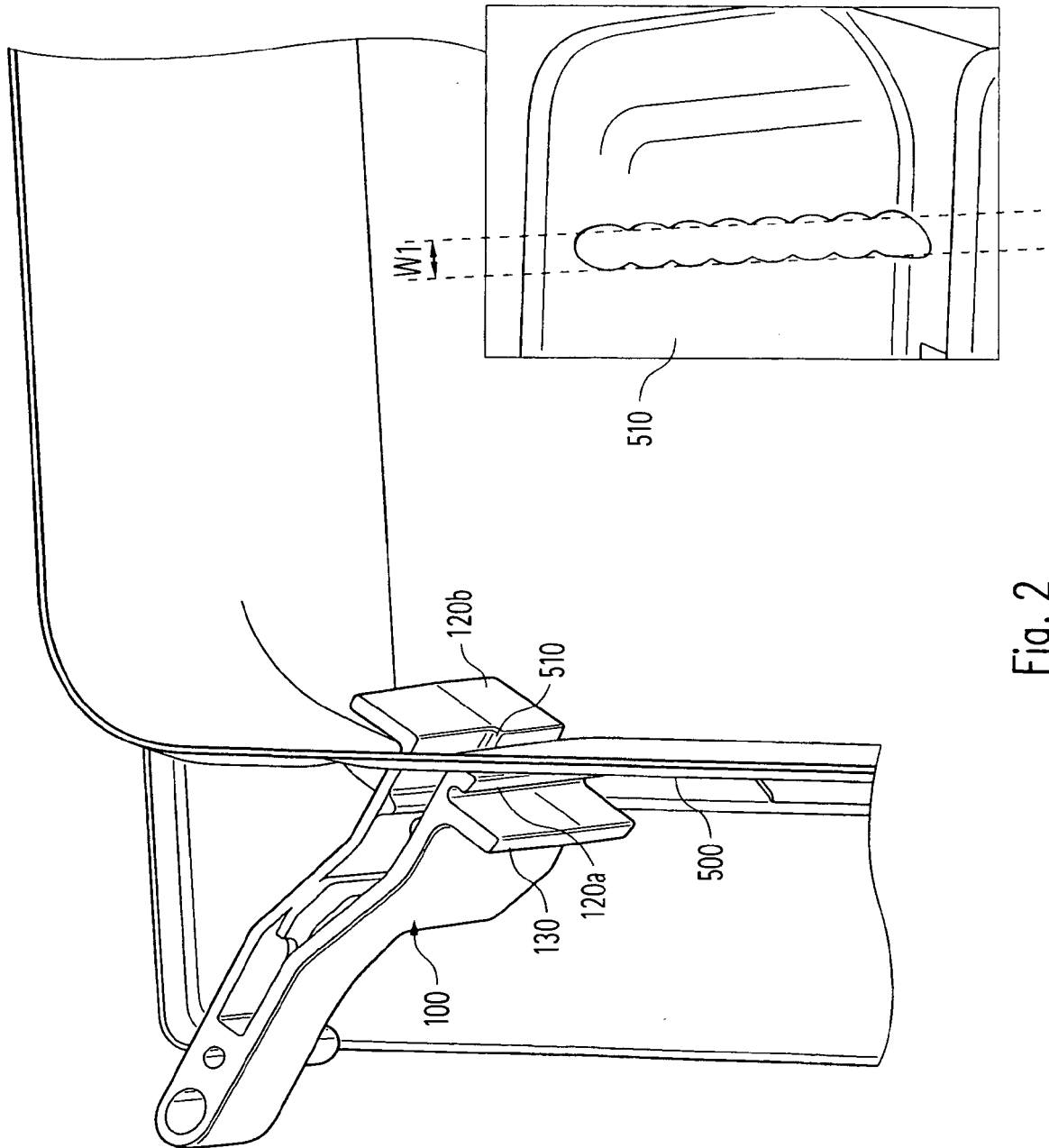
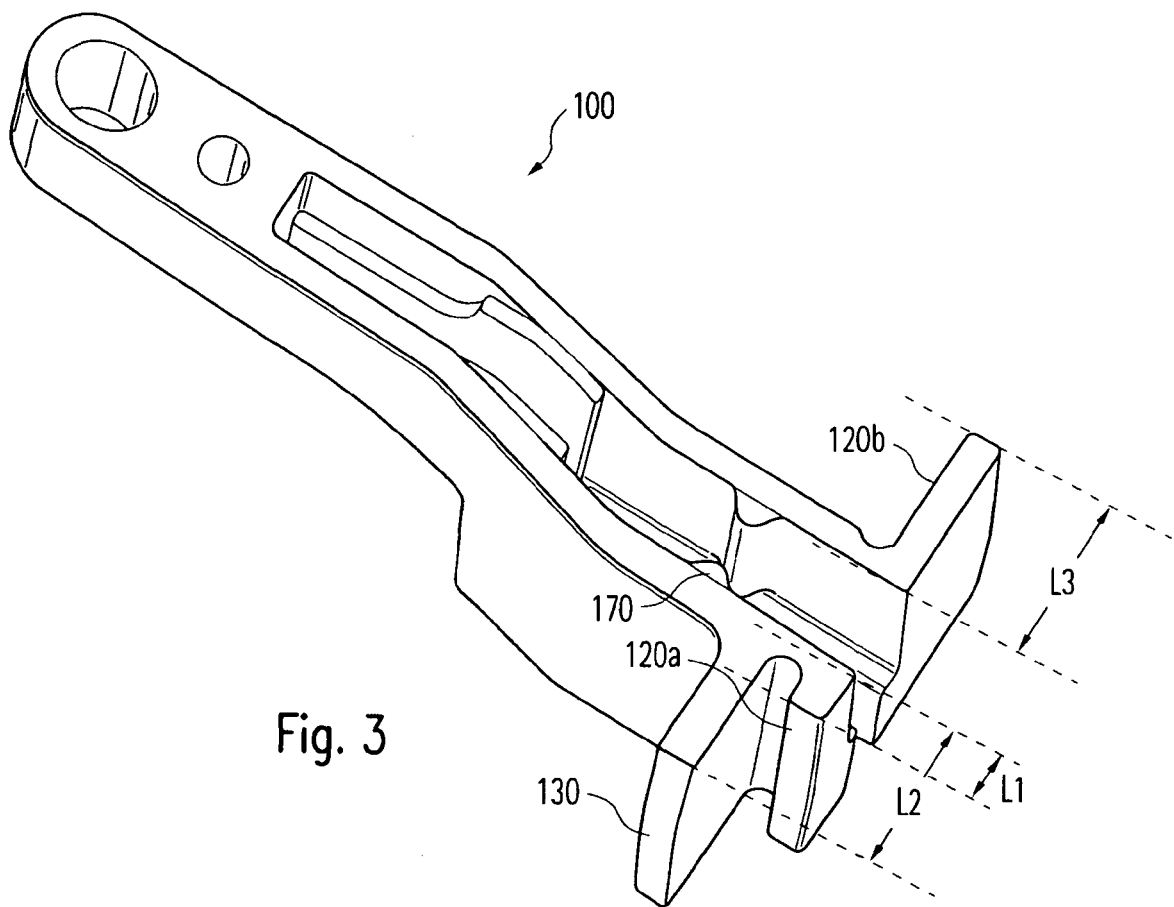


Fig. 2



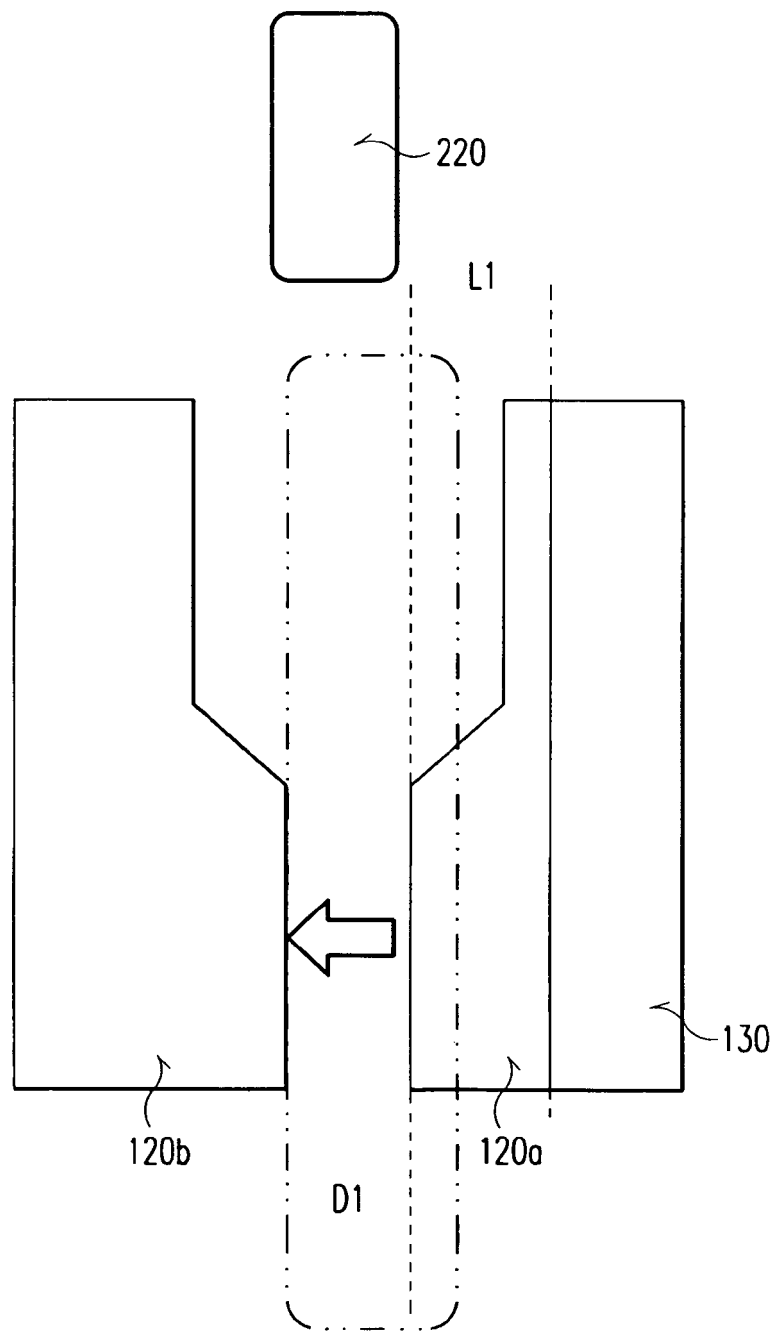
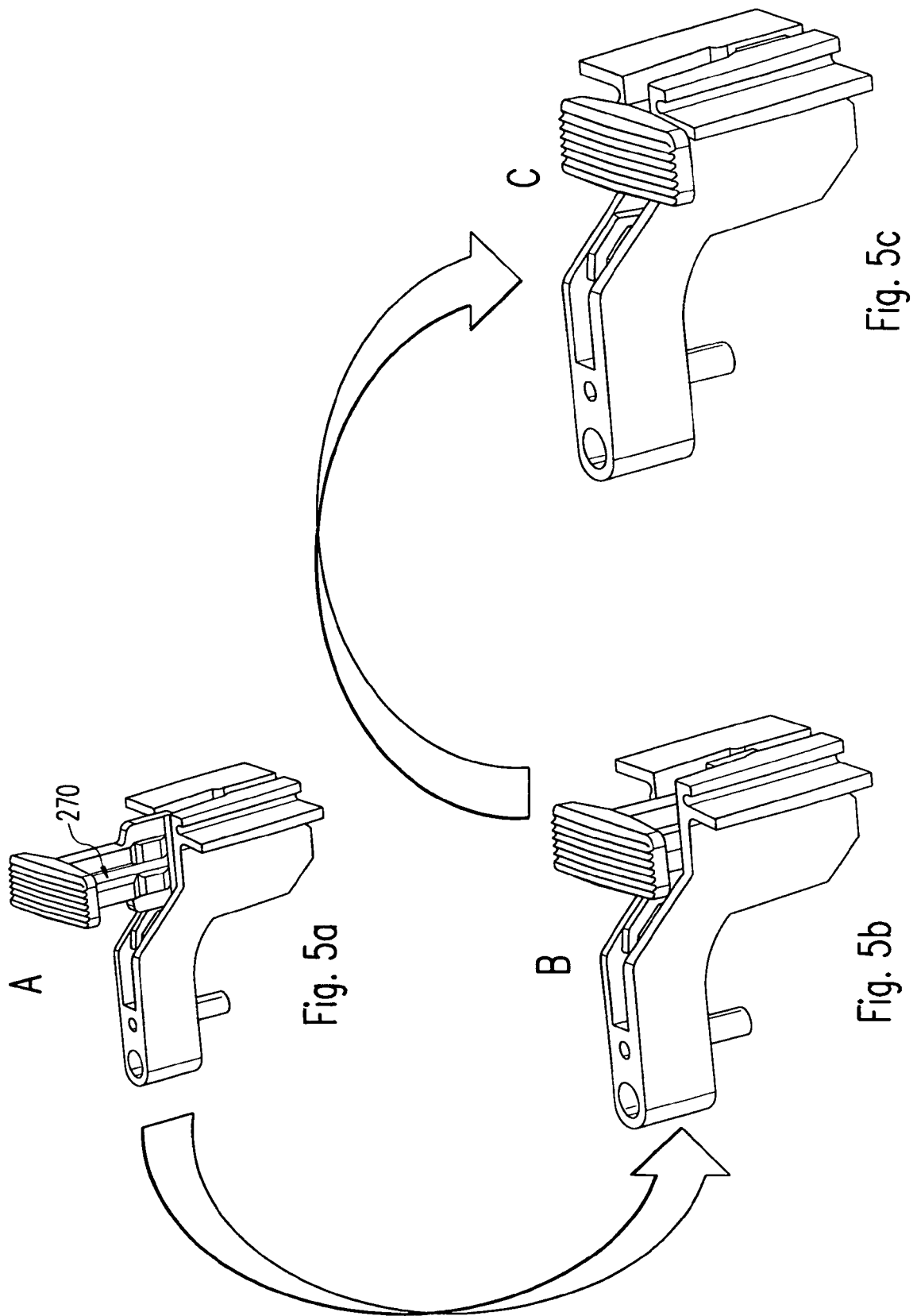


Fig. 4



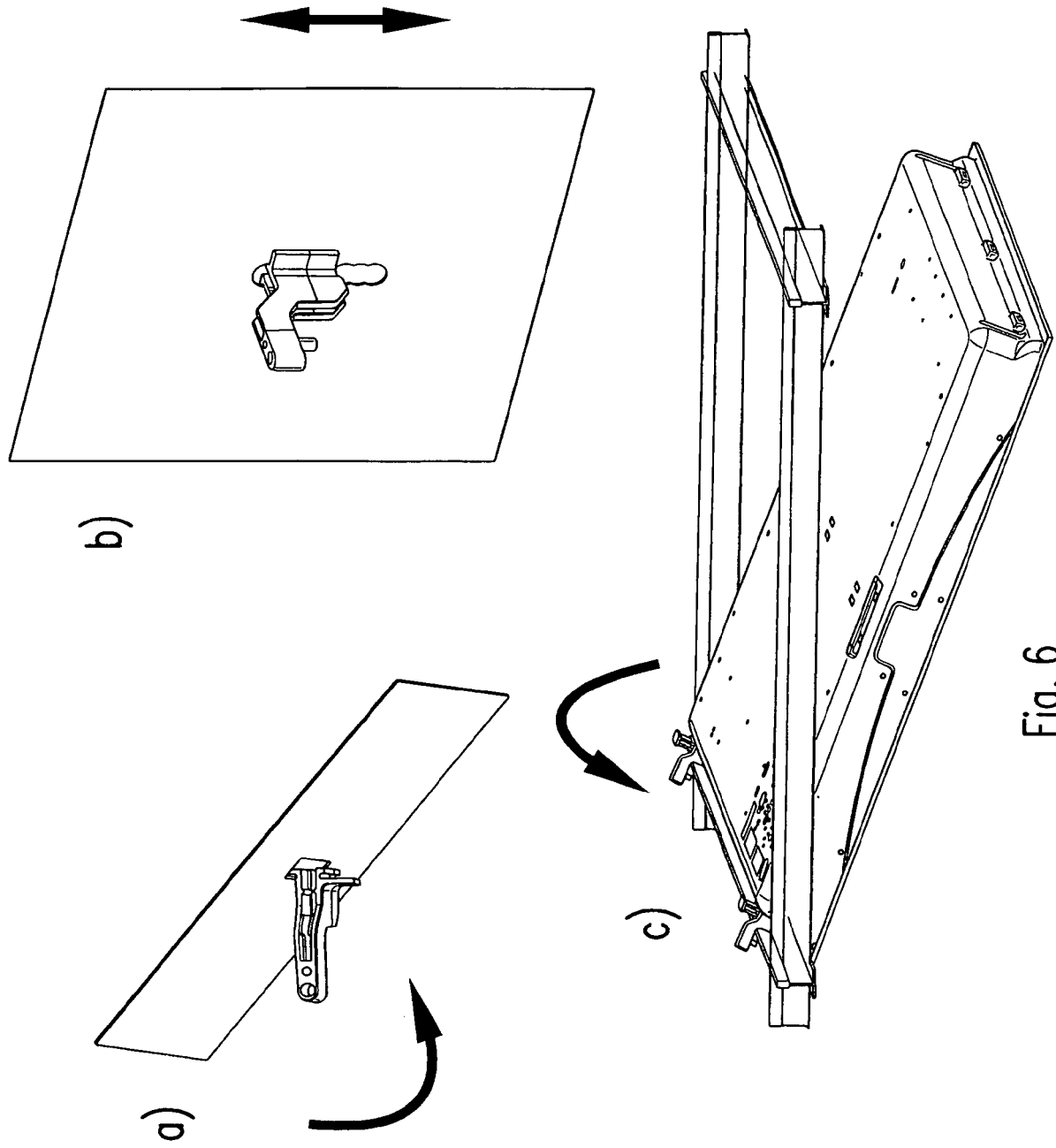


Fig. 6

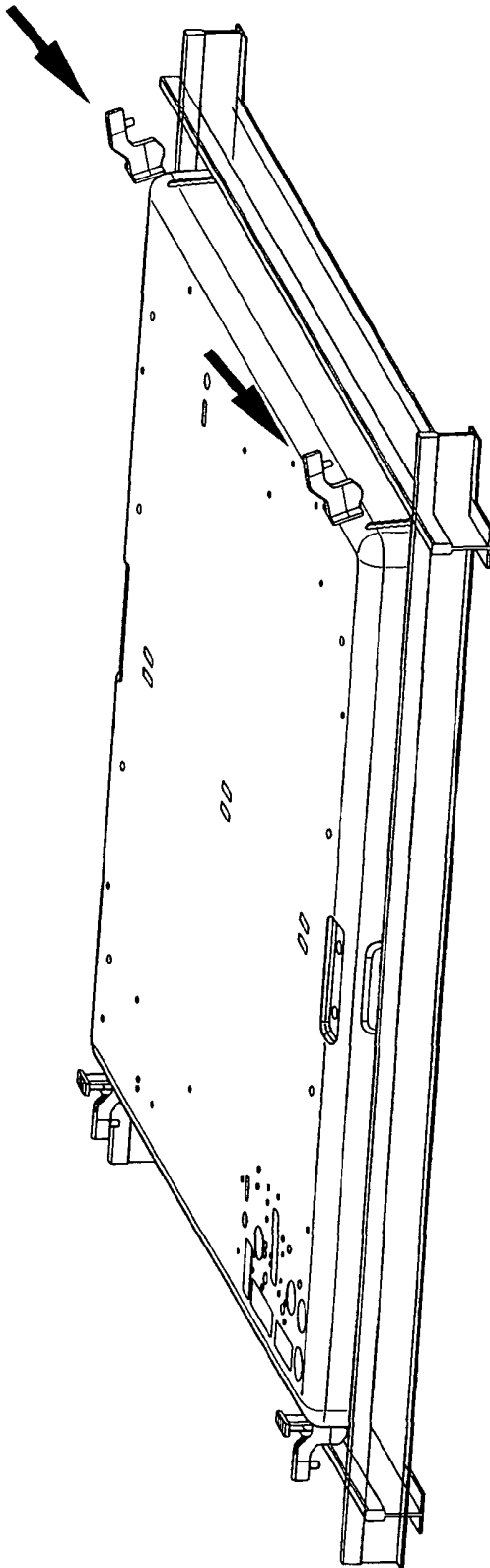


Fig. 7a

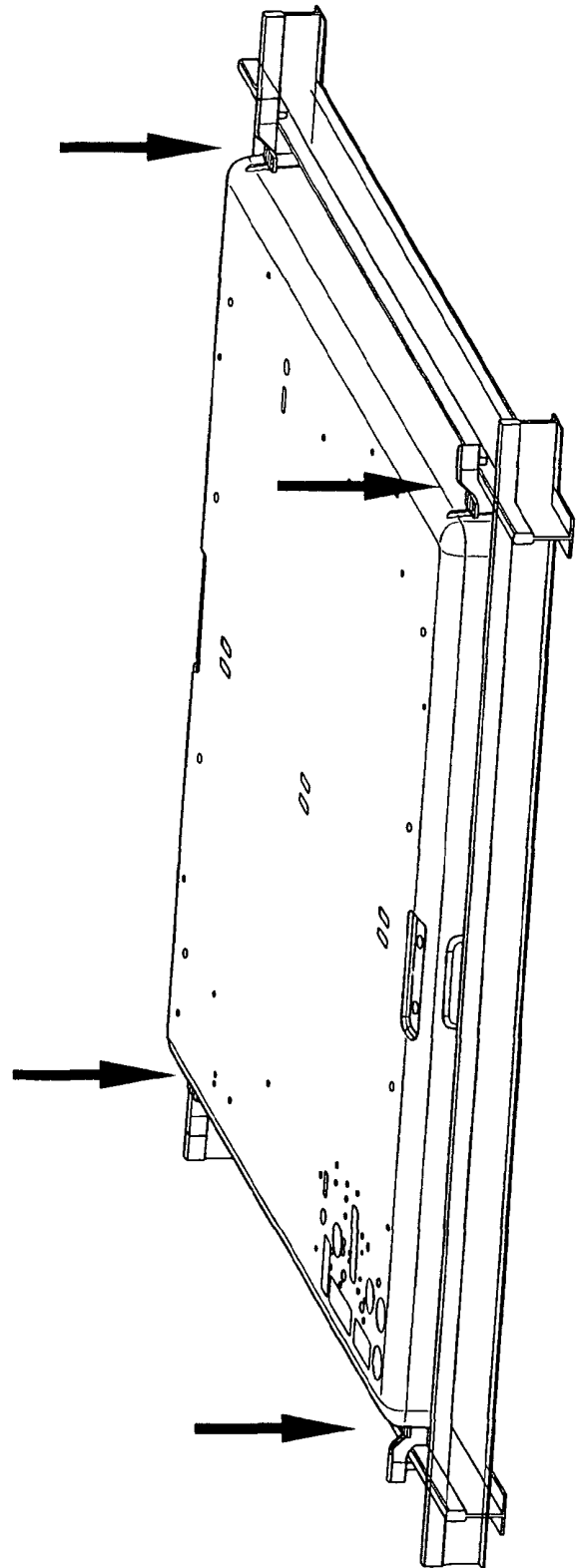


Fig. 7b

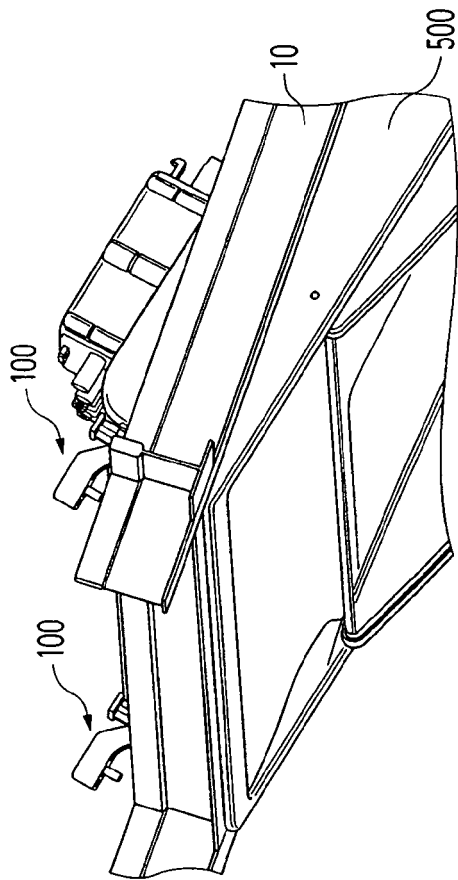


Fig. 8b

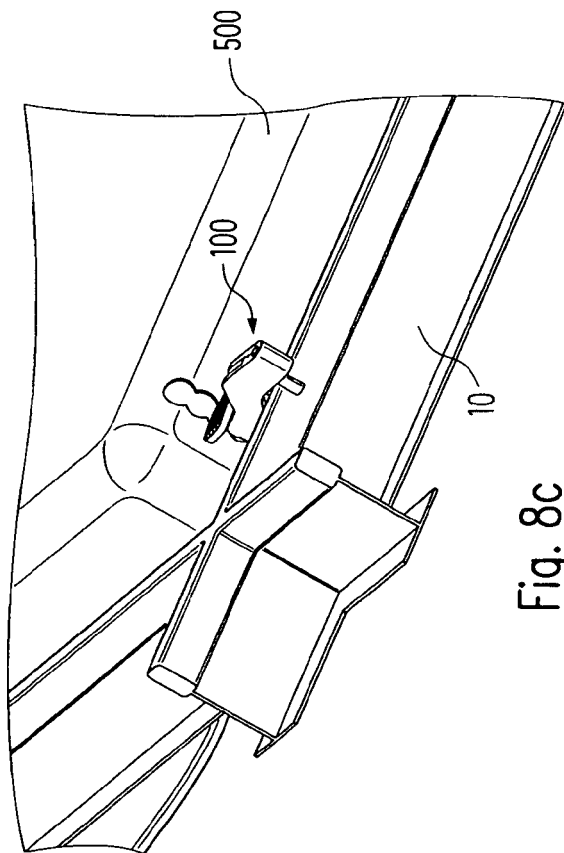


Fig. 8c

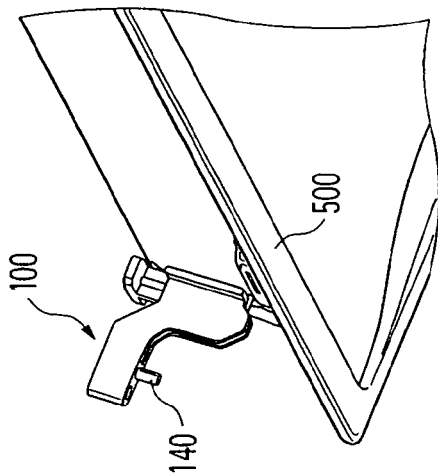


Fig. 8a

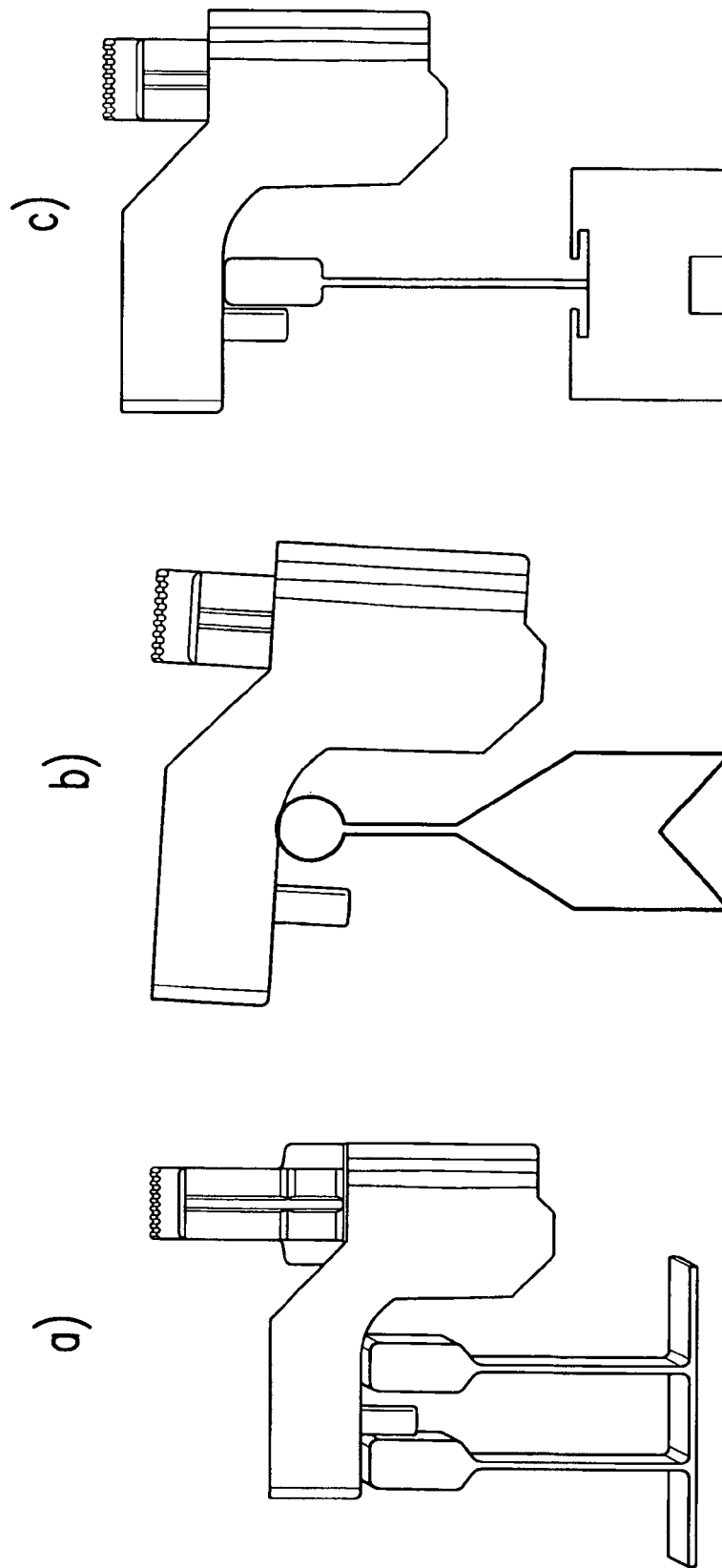


Fig. 9

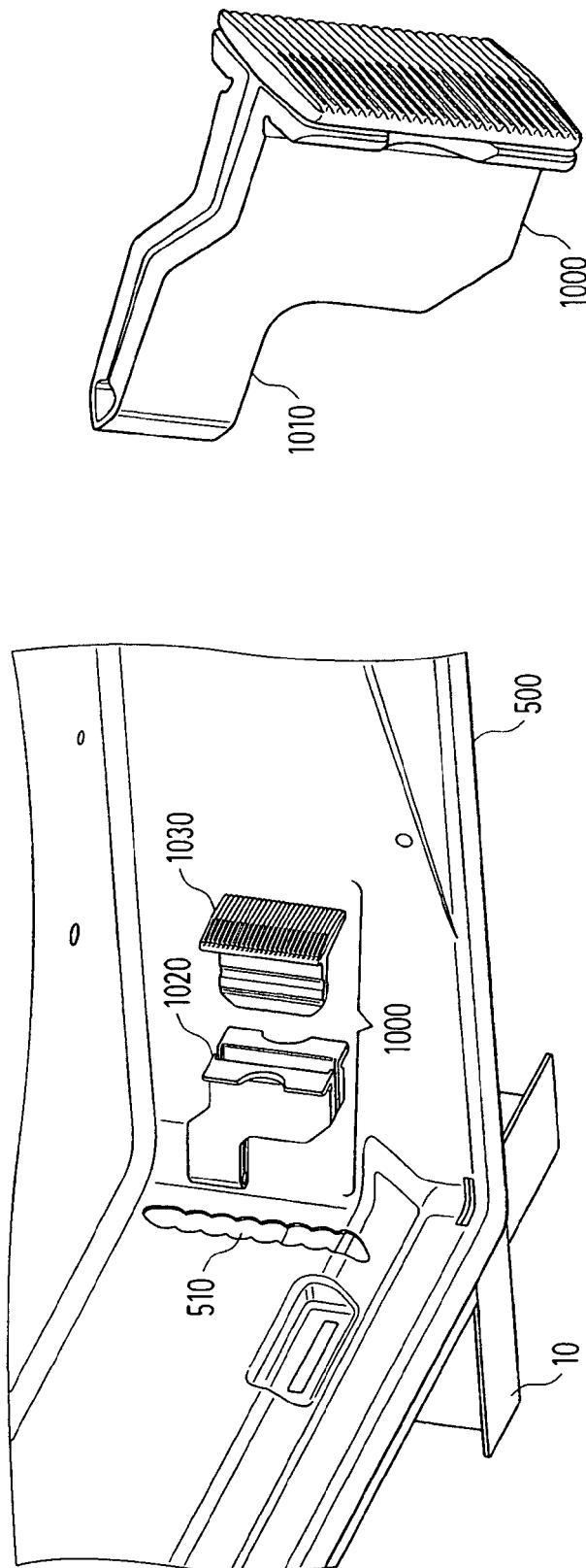


Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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