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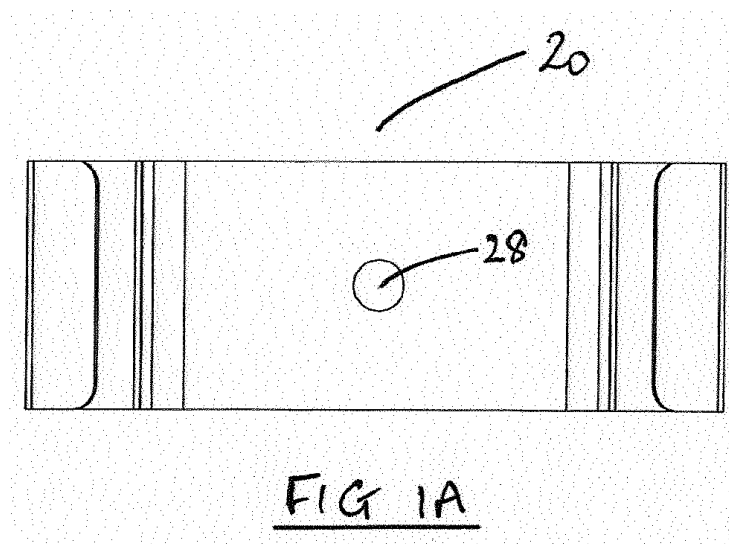
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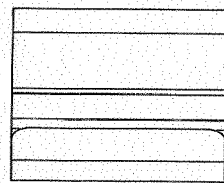
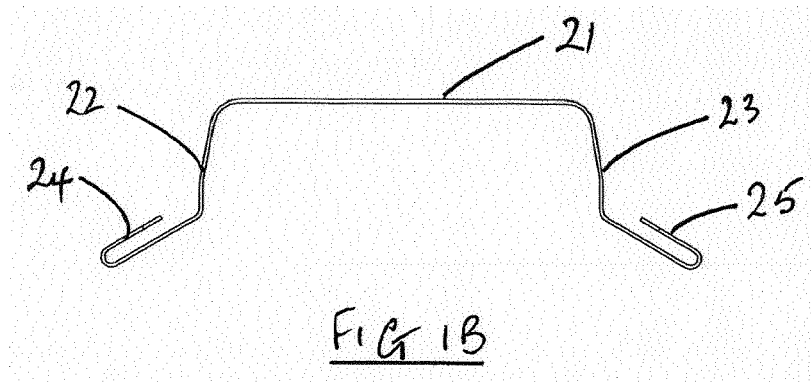
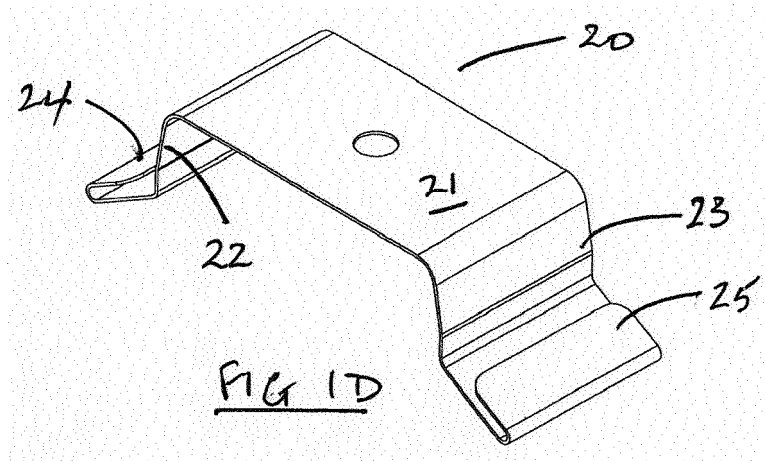
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(54) **IMPROVED SUSPENSION ASSEMBLY**

(57) A suspension apparatus suitable for suspending an item such as a linear luminaire from a support element or surface such as a ceiling by means of a tensile element or suspension means, said suspension apparatus comprising:-
(i) a chassis member on the item to be suspended said chassis member comprising a bottom portion and two opposing side portions, the chassis member incorporating a first attachment means in the form of an inwardly directed flange on each opposing side portion of the chassis member, said flanges being adapted to engage with one or more suspension clips in order to suspend the chassis member from a support element;
(ii) at least one resiliently deformable suspension clip adapted to attach to a tensile element, said suspension clip incorporating a second attachment means adapted to releasably engage with the first attachment means associated with the chassis member in order to attach/detach the suspension clip to the chassis member wherein the suspension clip is deformable between a detachable configuration in which the suspension clip can be separated from or placed into the chassis member and an attached configuration in which the suspension clip and the chassis member are fixedly attached to each other;
(iii) a suspension clip lock associated with the suspension clip wherein the suspension clip lock is movable between a locked position in which the suspension clip is locked in an attached configuration, and an unlocked position in which the suspension clip is deformable and can be attached to or detached from the chassis member.



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Description

Field of the Invention

[0001] The present invention relates to a suspension assembly or apparatus for suspending an item from a support element such as a ceiling or other surface. Suspension assemblies according to the present invention can be used to suspend a wide variety of items and are particularly applicable, but in no way limited, to suspending luminaires for example linear luminaires.

Background to the invention

[0002] Several systems are already available for suspending items such as linear luminaires from a ceiling or other surface, but these suffer from a number of disadvantages. Using linear luminaires as just one example of an item to be suspended, typically a series of tensile elements such as wires, ropes or other suspension means are attached to the ceiling using ceiling mounts, fixed to the ceiling in appropriate positions along the line in which the linear luminaires are to be hung. However, the tensile elements holders or fixings associated with the luminaire are often in fixed positions or, if the holders are adjustable, the amount of adjustment along the luminaire is limited. Having limited positional adjustment along the luminaire can present a significant handicap to the installer. The net result is that a considerable amount of pre-planning and accuracy is required when installing the run of ceiling mounts, and even if this accuracy is achieved, the flexibility of what lengths or arrangement of linear luminaires can be installed in that linear run is limited, both at the time of installation and at a later date if changes are required.

[0003] In some systems it is necessary to attach the tensile elements, suspension wires or other attachment means and their associated ceiling mounts to the luminaire prior to attaching the ceiling mounts to the ceiling. This can present considerable practical difficulties in holding the luminaire off the ground while securing the ceiling mounts to the ceiling where a variety of tools are required.

[0004] Known systems typically require the use of tools to complete the attachment of the tensile elements to the luminaire. These luminaires are generally installed well above normal head height, and therefore require the installer to work from a step ladder or other elevated platform. Because tools are required, and because the luminaire must be held aloft during the suspension procedure, this generally requires two people to complete the installation operation, to comply with health and safety regulations and safe working practices. This inevitably increases the cost of any installation.

[0005] A further disadvantage of some of the known systems is that the luminaire may become detached from the tensile elements unintentionally, such as if the luminaire is accidentally moved out of its normal suspended

configuration, or moved in order to access the electronic components inside the luminaire. Such accidental detachment is highly undesirable and can be very dangerous, possibly resulting in serious injury.

[0006] It is an object of the present invention to overcome or mitigate some or all of the problems outlined above.

Summary of the Invention

[0007] According to a first aspect of the present invention there is provided a suspension apparatus according to Claim 1. For example, there is provided a suspension apparatus suitable for suspending an item from a support element or surface such as a ceiling by means of a tensile element such as a wire, a rope or a chain, said suspension apparatus comprising:-

(i) a chassis member on the item to be suspended said chassis member comprising a bottom portion and two opposing side portions, the chassis member incorporating a first attachment means adapted to engage with one or more suspension clips in order to suspend the chassis member from a support element or surface;

(ii) at least one resiliently deformable suspension clip adapted to attach to a tensile element, said suspension clip incorporating a second attachment means adapted to releasably engage with the first attachment means associated with the chassis member in order to attach/detach the suspension clip to/from the chassis member; wherein the suspension clip is deformable between a detachable configuration in which the suspension clip may be separated from or placed into the chassis member and an attached configuration in which the suspension clip is no longer deformable and the chassis member and the suspension clip are fixedly attached to each other.

[0008] In a preferred embodiment there is provided a suspension apparatus suitable for suspending an item such as a linear luminaire from a support element or surface such as a ceiling by means of a tensile element or suspension means, said suspension apparatus comprising:-

(i) a chassis member on the item to be suspended said chassis member comprising a bottom portion and two opposing side portions, the chassis member incorporating a first attachment means in the form of an inwardly directed flange on each opposing side portion of the chassis member, said flanges being adapted to engage with one or more suspension clips in order to suspend the chassis member from a support element;

(ii) at least one resiliently deformable suspension clip adapted to attach to a tensile element, said suspension clip incorporating a second attachment means

adapted to releasably engage with the first attachment means associated with the chassis member in order to attach/detach the suspension clip to the chassis member wherein the suspension clip is deformable between a detachable configuration in which the suspension clip can be separated from or placed into the chassis member and an attached configuration in which the suspension clip and the chassis member are fixedly attached to each other; (iii) a suspension clip lock associated with the suspension clip wherein the suspension clip lock is movable between a locked position in which the suspension clip is locked in an attached configuration, and an unlocked position in which the suspension clip is deformable and can be attached to or detached from the chassis member.

[0009] By using a resiliently deformable suspension clip and a suspension clip lock that can be operated with a single hand, without tools, and even with a restricted view of the system/product, this greatly simplifies the process of suspending an item such as a luminaire from the ceiling, and the time taken to complete the process, and allows for a single handed installation.

[0010] Preferably the suspension clip lock is rotatably mounted with respect to the body of the suspension clip, such that the suspension clip lock is rotatable between locked and unlocked positions. Having a rotatable suspension clip lock simplifies installation considerably.

[0011] Preferably the suspension clip lock is movable between a locked position and an unlocked position by hand, without the use of tools.

[0012] Preferably the suspension clip is self-locating within the chassis member when in the locked configuration.

[0013] Preferably the second attachment means engages substantially entirely in use with an internal surface or surfaces of the chassis member.

[0014] Preferably the suspension clip comprises a cross member having resiliently deformable dependent legs, one leg being located substantially at each end of the cross member. Squeezing the legs between the fingers, as described below, causes the suspension clip to be deformed into a detachable configuration in which the suspension clip may be separated from or placed into the chassis member, whereas releasing the suspension clip returns it to an attached configuration in which the suspension clip and the chassis member are fixedly attached to each other.

[0015] Preferably the second attachment means comprises two feet, one foot being located substantially at the end of each dependent leg, said feet being folded back against their respective leg.

[0016] Preferably the suspension clip lock can be positively latched in relation to the suspension clip when it is in the 'locked' position. Such a suspension clip lock arrangement ensures that the system will remain in its determined position unless a user intentionally changes

it.

[0017] Preferably the outermost side edge of each opposing side portion of the chassis member incorporates a flange directed back into the chassis member to create a channel such that, in use, the feet at each end of the suspension clip engage with their respective channels on the opposing side portions of the chassis member to hold the suspension clip captive in the chassis member. This positive engagement of the suspension clip with the chassis member makes for easy assembly and tends to prevent inadvertent disengagement of the two components.

[0018] This channel arrangement also enables the suspension clip to slide along the channel for ease of correct positioning.

[0019] Preferably the flanges on the side edges of the chassis member extend for substantially the whole length of the chassis member, such that the suspension clips may be placed anywhere along the length of the chassis member. These full length channels enable the suspension clips to be located at any suitable location in order to suspend the luminaire at any point where there are features required for the correct functioning of the system.

[0020] In a particularly preferred embodiment the two opposing side portions of the chassis member are substantially fixed at an obtuse angle with respect to the bottom portion of the chassis member, such that the chassis member is substantially trapezoidal or frustoconical in cross-section, that is shaped like a trapezium with two substantially parallel sides when viewed in the 'in use' configuration, the shorter of the two parallel sides of the trapezium forming the base of the chassis member. Because the sides of the chassis member are angled outwards away from the base, or angled inwards towards the bottom or base of the chassis member, this ensures that the suspension clips are automatically located in the correct operating position in the channel provided, without tools or adjustment from the user. It also means that, once located and locked, the suspension clips cannot be moved or removed accidentally because they are, in effect, trapped in that position.

[0021] Preferably the top of the chassis member is substantially open, allowing access into the body of the chassis member to position the suspension clips as required, and to place and replace components.

[0022] Preferably the suspension apparatus further comprises at least one suspension means or tensile element holder adapted to attach a tensile element to the suspension apparatus, and preferably the tensile element holder is attached to or forms part of the suspension clip.

[0023] Preferably the tensile element holder incorporates a clutch mechanism to allow the length of the tensile element to be adjusted in situ.

[0024] In a particularly preferred embodiment the item to be suspended is a luminaire, and preferably a linear luminaire.

[0025] According to a further aspect of the present invention there is provided a suspension clip assembly for suspending an item from a support element or surface such as a ceiling by means of a tensile element such as a wire, rope or chain, said assembly comprising:-

- (i) a resiliently deformable suspension clip adapted to attach to a tensile element, said suspension clip incorporating an attachment means adapted to releasably engage with the item in order to attach/detach the suspension clip to/from the item, the suspension clip being deformable between a detachable configuration in which the suspension clip and the item may be separated, and an attached configuration in which the suspension clip and the item are fixedly attached to each other; and
- (ii) a suspension clip lock;

wherein the suspension clip lock is movable between a locked position in which the suspension clip is locked in the attached configuration and is no longer deformable, and an unlocked position in which the suspension clip is deformable.

[0026] Preferably the suspension clip comprises a cross member having resiliently deformable dependent legs, one leg being located substantially at each end of the cross member.

[0027] Preferably the attachment means comprises two feet, one foot being located substantially at the end of each dependent leg, said feet being folded back against their respective leg.

[0028] Preferably the suspension clip lock is rotatably mounted with respect to the body of the suspension clip, such that the suspension clip lock is rotatable between locked and unlocked positions.

[0029] Preferably the suspension clip lock is movable between a locked position and an unlocked position by hand, without the use of tools.

[0030] Preferably the suspension clip assembly further comprises at least one suspension means or tensile element holder adapted to attach to a tensile element and more preferably the tensile element holder is attached to or forms part of the suspension clip. Preferably the tensile element holder incorporates a clutch mechanism to allow the length of the tensile element to be adjusted, which is particularly advantageous when the tensile element comprises a wire or a rope.

[0031] Preferably the attachment means engages with a channel or channels in a chassis member of the item.

[0032] The present invention also extends to a method of suspending an item from a support element such as a ceiling or other surface using suspension apparatus as claimed and described herein.

[0033] It will be understood that the present apparatus is designed and adapted to suspend a wide variety of items from a ceiling or other structural element, although it will be described below, by way of example only, in the context of suspending a luminaire. But a luminaire is just

one example of a wide range of items that can be suspended using the present invention. The present suspension apparatus has an advantage that it is designed to put itself in the correct operating position without tools or adjustment from the user. This self-positioning feature is achieved by the geometry of the system in combination with its material properties.

[0034] Some major advantages of the present system, compared to known suspension systems, are that:-

- (a) It enables an installer to suspend a luminaire single handed, without tools and even with limited or restricted visibility of the system or item being suspended;
- (b) The system will put itself in the correct position, mitigating human error when installing items such as suspended luminaires, and in the case of incorrect positioning, the system will not allow operation, because the suspension clip will not engage with the chassis member and/or the suspension clip lock will not operate correctly;
- (c) It mitigates human error;
- (d) It prevents accidental detachment of the luminaire due to unexpected circumstances.

[0035] The advantages described above for the suspension of luminaires apply equally well to other items to be suspended.

[0036] The present invention also extends to a method of suspending an item such as a luminaire from a ceiling or other support element using a suspension apparatus as claimed and described herein.

Brief description of the drawings

[0037] The invention will now be described, by way of example only, in relation to the accompanying figures wherein:

Figures 1A to 1D illustrate a top elevation view, a side elevation view, an end elevation view and a perspective view for one side respectively, of a suspension clip according to one embodiment of the present invention;

Figures 2A to 2F illustrate a top elevation view, a side elevation view, a bottom view, a further side elevation view, a perspective view from underneath, and a perspective view from above respectively, of a suspension clip lock;

Figures 3A to 3C illustrate in exploded view format a view from one side, a perspective view from above and a perspective view from below respectively of a suspension wire holder, a suspension clip and a suspension clip lock;

Figures 4A and 4B illustrate upper and lower views respectively of a combination of a suspension wire holder, a suspension clip and a suspension clip lock in an assembled state in the 'locked' configuration;

Figures 4C and 4D illustrate upper and lower views respectively of a combination of a suspension wire holder, a suspension clip and a suspension clip lock in an assembled state in the 'unlocked' configuration, in which the suspension clip is deformable;

Figures 5A and 5B show sectional views of the combination of parts shown in Figure 4 located in the top of a chassis member in the unlocked and locked configurations respectively, with the legs/feet on the suspension clip located in channels on the opposing sides at the top of a chassis member;

Figures 6A and 6B show diagrammatically how a suspension clip, with the suspension clip lock in the unlocked position, may be deformed by finger pressure in order to fit the suspension clip into the body of a chassis member;

Figure 7 shows a cross-sectional view of a chassis member or chamber.

Description of the Preferred Embodiments

[0038] The present invention will now be described by way of example only. These are the best ways currently known to the applicant of putting the invention into practice, but they are not the only ways. Although the examples described are based on a linear luminaire the suspension apparatus or assembly described herein is applicable to the suspension of a wide range of other items and other types of luminaires that require to be suspended from some sort of support element such as a ceiling, a pipe, a cable tray, a track, a T-bar or other surface, to give just a few examples of possible types of support element. This list is not intended to be exhaustive but is intended simply to illustrate the wide range of different elements, surfaces or substrates that items may be suspended from. The nature of the support element or surface is not critical, so long as it is sound and can take the weight of the item to be suspended from it.

[0039] Referring to Figure 1, this shows various views of a suspension clip 20. This clip comprises a cross member 21, and two dependent legs 22, 23, one at each end of the cross member. At the end of each leg is a foot 24, 25, bent back against the end of the leg. This bent back arrangement offers a number of advantages. Firstly it removes or avoids any sharp edges on the end of the legs that might otherwise interfere with free movement of the suspension clip, as described in more detail below. And secondly, the foot is sized, shaped and angled so as to fit into a channel in a chassis member (see below). However, having a foot and having it bent back against the leg is not essential and there are other ways to create a functional feature to achieve the same objective of locating the end of a leg in a channel, and without exposed sharp edges.

[0040] The suspension clip is formed from a resiliently deformable material such that pressure, for example pressure between a finger and thumb, on the outsides of opposing legs causes the distance between the ends

of the opposing feet to be reduced. An example of this deformation is shown in Figure 6. By reducing the distance between the ends of the legs it becomes possible to locate the legs of the suspension clip inside the top of the chassis member, or remove the suspension clip from the chassis member. A suitable material or materials for the construction of the suspension clips will be determined by the materials specialist. Suitable materials include spring steel or other resiliently deformable metals and metal alloys, plastics materials such as nylon, polycarbonate and ABS, including glass reinforced plastics.

[0041] A suspension clip lock is shown in Figures 2A to 2E and its mode of operation in Figures 3, 4 and 5. The suspension clip lock 30 is moveably mounted with respect to the suspension clip, and in this example it is rotatably mounted through a central hole 38. The body of the suspension clip lock is unsymmetrical about its central axis in that it has a wide radial distance or diagonal 35, between points or tips 31 and 32 at opposite ends of diagonal 35. It has a narrow diagonal 36, substantially perpendicular to diagonal 35, with sides 33 and 34 at opposite sides of diagonal 36. Lugs 39A and 39B act both as gripping points by which to rotate the suspension clip lock 30 and stops to keep it locked in the locked position. The suspension clip lock 30 is typically formed from a metal or a plastics material and is substantially rigid. Additional rigidity may be conferred by vanes 37, or other equivalent features, on the underside of the lock body.

[0042] Figures 3A to 3C illustrate in exploded form how the suspension clip 20 and the suspension clip lock 30 may be secured together, in this example by means of a nut 50 threaded onto a threaded end 41 of a suspension wire holder 40 through hole 38 in the suspension clip lock and hole 28 in the suspension clip itself. Although the suspension clip and the suspension clip lock are attached together, the two components are still free to rotate with respect to each other, to the extent that lugs 39A and 39B will allow. The degree of rotation is shown more clearly in Figure 4, where Figures 4A and 4B show the "locked" configuration and Figures 4C and 4D show the "unlocked" configuration.

[0043] Although the present example uses a wire which is retained in a wire holder, a wire is just one type of tensile element or suspension means that can be used. The generic term 'tensile element' in this context has a very broad meaning and includes for example wire, rope, cord, chain, bar or cable, to give but a few examples. The tensile element simply has to have sufficient tensile strength to support the weight of the item being suspended. Where a flexible tensile element is used, the tensile element holder may incorporate a clutch or other mechanism to allow the length of the tensile element to be adjusted. This simplifies installation somewhat in that the extra wire/rope can be used initially so that the luminaire can be installed at a convenient work height, and then the wire/rope shortened to move the luminaire upwards to the desired height. This clutch feature also makes lev-

elling the item much easier. Any excess wire/rope can be cut off if not required once the installation is complete.

[0044] It will be understood that the design of suspension clip lock described above and in these figures is just one type of suspension clip lock that could be used. It acts, in effect, as a double ended cam designed to stop the suspension clip from being deformed by compressive forces. So any mechanically equivalent mechanism or design that achieves the desired result could be employed.

[0045] The "locked" and "unlocked" configurations are further illustrated in Figure 5, which shows sections of the assembled suspension clip assembly comprising the wire holder 40, suspension clip 20 and suspension clip lock 30 combination engaged with part of a chassis member or chassis chamber 60. A cross-section of a typical chassis chamber is shown in Figure 7. The chassis 60 consists of a base or bottom portion (not shown) with two opposing side portions 61, 62, only the tops of which are shown for clarity. The angle of these side portions with respect to the base portion is an important feature in this preferred embodiment in that the sides form an obtuse angle with the base. That is to say the sides splay out away from the base such that the chassis member becomes narrower towards the base. Thus in this example the body of the chassis chamber or member is substantially trapezoidal in cross-section, if one considers the base, two sides and the open top and discounts the inwardly directed flanges 63 and 64 (see below), the cross-section approximating to a trapezium. It could also be described as substantially frustoconical in cross-section, that is to say it is shaped like an inverted frustum of a cone when viewed in cross-section in the 'in use' or suspended configuration, with the base of the chassis chamber directed downwards into the space beneath it.

[0046] The top edge of each side portion is shaped inwards to create an inwardly directed flange 63, 64 and an upstand or inwardly directed lug 65, 69 and 66, 70 at the end of each flange creates what are in effect two channels 67, 68, one substantially along each top inside edge of the chassis chamber. The chambers can be formed by extrusion and as a result the channels 67, 68 can extend for substantially the whole length of the chamber. The width and depth of the channels 67, 68 are designed to substantially correspond to the size for the feet 24, 25 which are designed to nest in those channels. Figure 5A shows the suspension clip lock in an "unlocked" configuration, in which the legs 22, 23 can be compressed such that the suspension clip assembly can be disengaged and detached from the chassis. Figure 5B on the other hand shows the suspension clip lock in a "locked" configuration, with the tips or points 31, 32 of the lock pressed firmly against the legs 22, 23 of the suspension clip. In this "locked" configuration the legs 22, 23 of the suspension clip are constrained and cannot be compressed inwards because the lock is in the way. That fact, and the fact that the width of the cross-section of the chassis chamber decreases as one moves down

into the chamber means that the suspension clip is held fast in the position shown in Figure 5B, and also means that the suspension clip is self-locating inside the channels when in the locked configuration (see more detail below).

[0047] Importantly therefore, because the sides of the chassis member are angled outwards away from the base, or to describe this another way, angled inwards towards the bottom or base of the chassis chamber, this ensures that the suspension clips are automatically located in the correct operating position in the channels provided, without tools or adjustment from the user. It also means that, once located and locked, the suspension clips cannot be moved or removed accidentally because they are, in effect, trapped in that position. They are prevented from moving upwards by the channels at the top of the chamber sides, and from moving downwards by the ever narrowing width of the chamber body. The small inwardly directed lugs 65 and 66 also play an important role because even if a downward force strong enough to deform the locked suspension clip is applied, these lugs prevent the ends of the feet from disengaging from the channels.

[0048] It will be appreciated however that although the angled arrangement of the sides of the chamber with respect to the base described above is a preferred one, this is not essential. The sides could be substantially perpendicular to the base, or even splay outwards from the base slightly, and this suspension apparatus system would still function adequately.

[0049] Figure 6A and 6B show diagrammatically how by using only finger pressure the suspension clip can be compressed when the lock is in the "unlocked" configuration and the suspension clip assembly inserted into a chassis chamber. Releasing the pressure on the suspension clip legs allows them to return to their "at rest" state and they automatically rise up the chamber sides 61, 62 such that the feet 24, 25 nest into the channels 67, 68 provided. Once the suspension clip lock is rotated to the "locked" position, again by hand and without the need for any tools, separation of the chassis chamber assembly and the suspension clip assembly is no longer possible. This 'toolless installation operation is particular advantageous because, once the necessary fixings have been attached to the support surface, no additional tools are required, allowing the possibility of one person or single handed installation.

[0050] Another important feature of this suspension apparatus system is that the suspension clips engage substantially entirely with internal surfaces of the chassis member, and no parts of the suspension apparatus overhang or project beyond the sides of the chassis chamber. Thus the suspension apparatus is entirely invisible when viewed from below the item being suspended.

[0051] Although the examples described above relate to a trapezoid-shaped chassis member, it will be appreciated that a wide variety of shapes of chassis member can be suspended using a suspension apparatus accord-

ing to the present invention. Provided the chassis member has opposing inwardly directing flanges or lips, the suspension apparatus will perform its function. So the sides of the chassis member could be substantially parallel, or could be angled inwardly from the base, and the invention will still work adequately.

Claims

1. A suspension apparatus suitable for suspending an item such as a linear luminaire from a support element or surface such as a ceiling by means of a tensile element or suspension means, said suspension apparatus comprising:-

(i) a chassis member on the item to be suspended said chassis member comprising a bottom portion and two opposing side portions, the chassis member incorporating a first attachment means in the form of an inwardly directed flange on each opposing side portion of the chassis member, said flanges being adapted to engage with one or more suspension clips in order to suspend the chassis member from a support element;

(ii) at least one resiliently deformable suspension clip adapted to attach to a tensile element, said suspension clip incorporating a second attachment means adapted to releasably engage with the first attachment means associated with the chassis member in order to attach/detach the suspension clip to the chassis member wherein the suspension clip is deformable between a detachable configuration in which the suspension clip can be separated from or placed into the chassis member and an attached configuration in which the suspension clip and the chassis member are fixedly attached to each other;

(iii) a suspension clip lock associated with the suspension clip wherein the suspension clip lock is movable between a locked position in which the suspension clip is locked in an attached configuration, and an unlocked position in which the suspension clip is deformable and can be attached to or detached from the chassis member.

2. A suspension apparatus according to Claim 1 wherein the suspension clip lock is rotatably mounted with respect to the body of the suspension clip, such that the suspension clip lock is rotatable between locked and unlocked positions.
3. A suspension apparatus according to Claim 1 or Claim 2 wherein the suspension clip is self-locating in the chassis member when in the locked configuration.

4. A suspension apparatus according to any preceding claim wherein the second attachment means engages substantially entirely in use with an internal surface or surfaces of the chassis member.

5. A suspension apparatus according to any preceding claim wherein the suspension clip comprises a cross member having resiliently deformable dependent legs, one leg being located substantially at each end of the cross member.

6. A suspension apparatus according to Claim 5 wherein the second attachment means comprises two feet, one foot being located substantially at the end of each dependent leg, said feet being folded back against their respective leg.

7. A suspension apparatus according to any preceding claim wherein the inwardly directed flange on each opposing side portion of the chassis member is so sized and shaped as to create a channel on each side portion of the chassis member such that, in use, the second attachment means of the suspension clip engages with the channels on the opposing side portions of the chassis member to hold the suspension clip captive in the chassis member, wherein the flanges on the side portions of the chassis member extend for substantially the whole length of the chassis member, such that the suspension clips can be placed substantially anywhere along the length of the chassis member.

8. A suspension apparatus according to any preceding claim wherein the two opposing side portions of the chassis member are arranged at an obtuse angle with respect to the bottom portion of the chassis member, such that the chassis member is substantially trapezoidal in cross-section.

9. A suspension apparatus according to any preceding claim wherein the top of the chassis member is substantially open, allowing access into the body of the chassis member to place and replace components.

10. A suspension apparatus according to any preceding claim further comprising at least one tensile element holder adapted to attach to a tensile element to the suspension apparatus, wherein the tensile element holder is attached to or forms part of the suspension clip.

11. A suspension apparatus according to any preceding claim wherein the tensile element comprises a wire or a rope.

12. A suspension apparatus according to Claim 11 when dependent on Claim 10 wherein the tensile element holder incorporates a clutch mechanism to allow the

length of the tensile element to be adjusted.

13. A suspension apparatus according to any preceding claim wherein the suspension clip lock is movable between a locked position and an unlocked position by hand, without the use of tools. 5

14. A suspension apparatus according to any preceding claim wherein the item to be suspended comprises a linear luminaire. 10

15. A suspension clip assembly for suspending an item from a support element by means of a tensile element or suspension means, said assembly comprising:- 15

- (i) a resiliently deformable suspension clip adapted to attach to a tensile element, said suspension clip incorporating an attachment means adapted to releasably engage with the item in order to attach/detach the suspension clip to/from the item, the suspension clip being deformable between a detachable configuration in which the suspension clip and the item can be separated, and an attached configuration in which the suspension clip and the item are fixedly attached to each other; and 20 25
- (ii) a suspension clip lock;

wherein the suspension clip lock is movable between a locked position in which the suspension clip is locked in an attached configuration and is no longer deformable, and an unlocked position in which the suspension clip is deformable. 30 35

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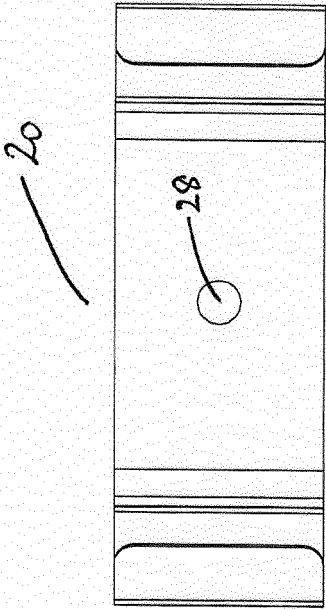


FIG 1A

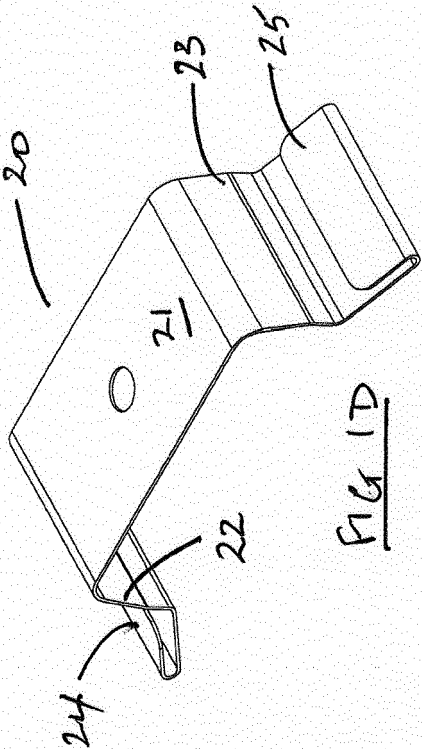


FIG 1D

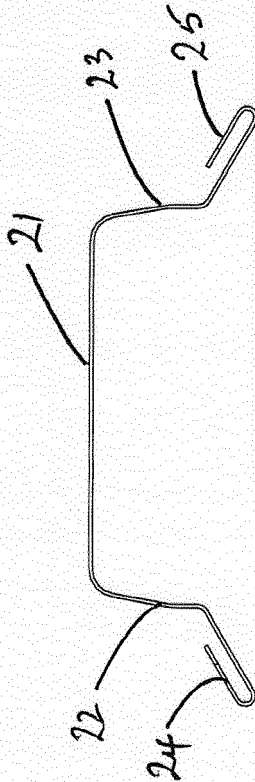


FIG 1B

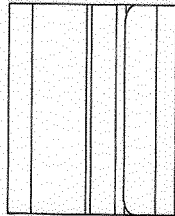
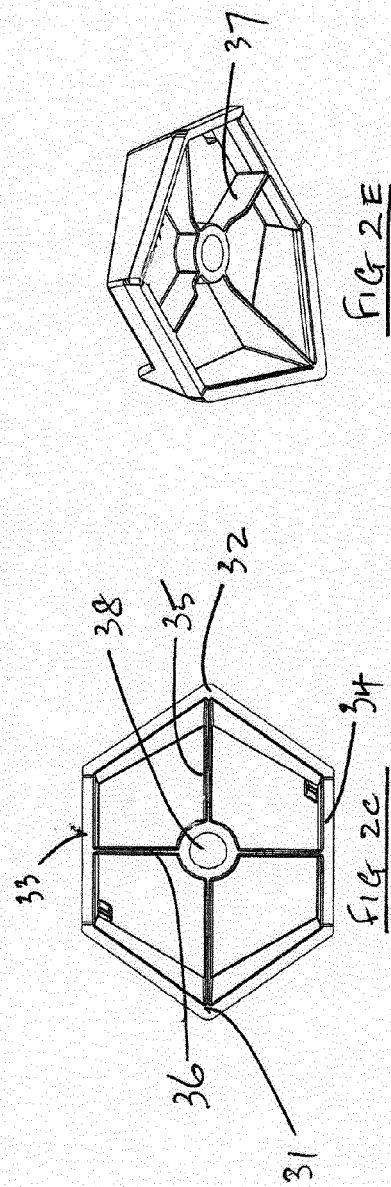
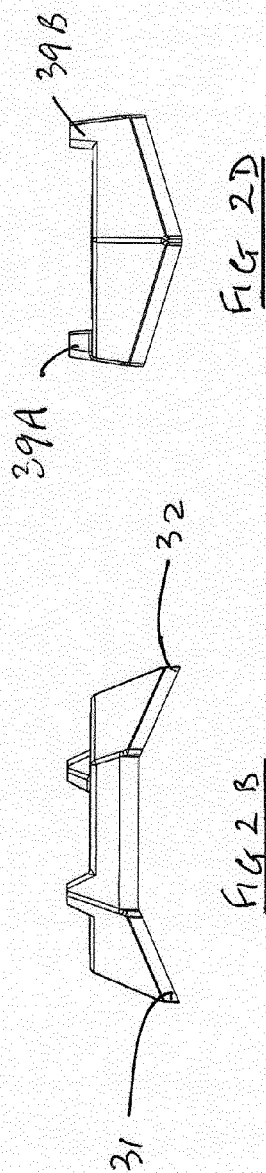
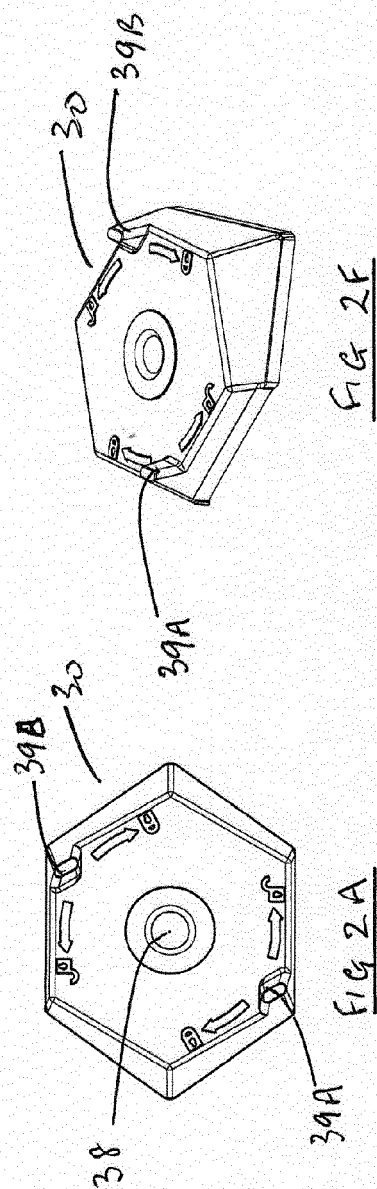
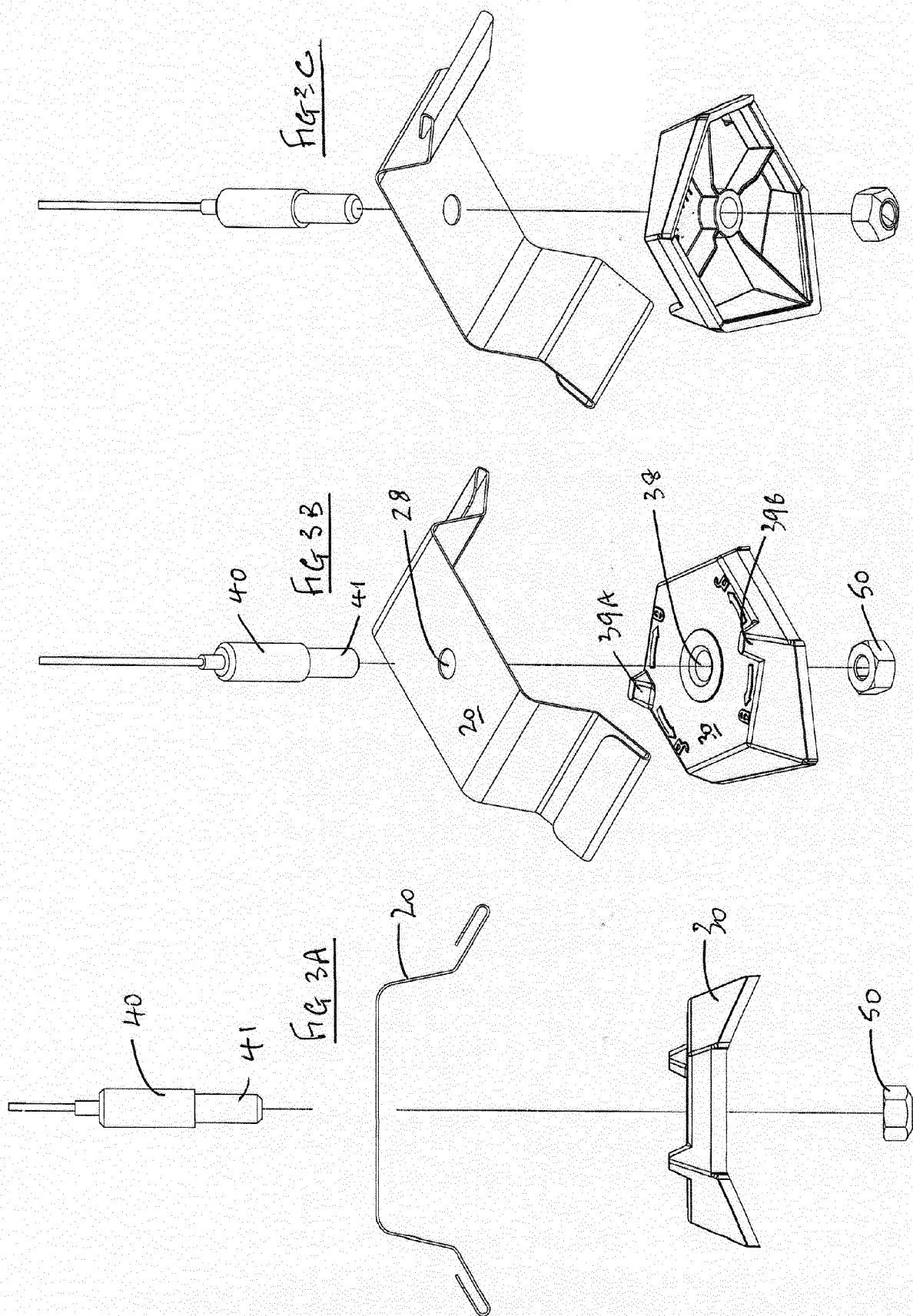
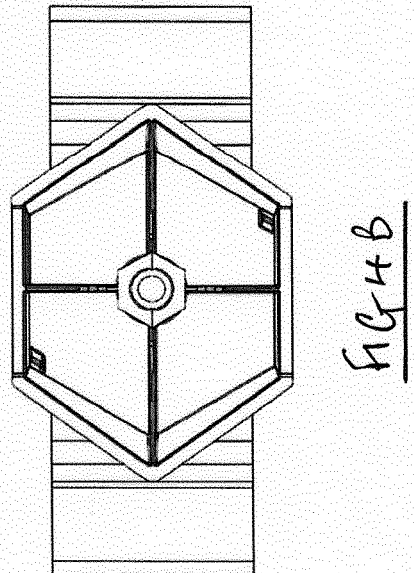
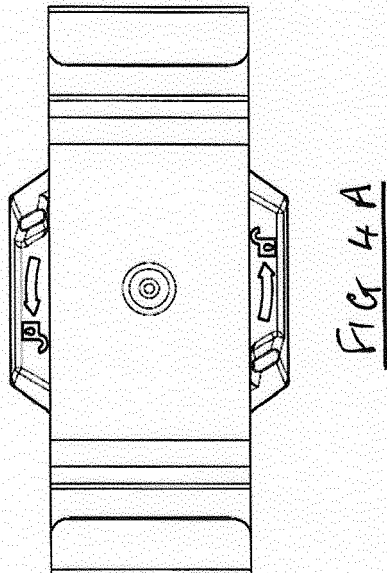
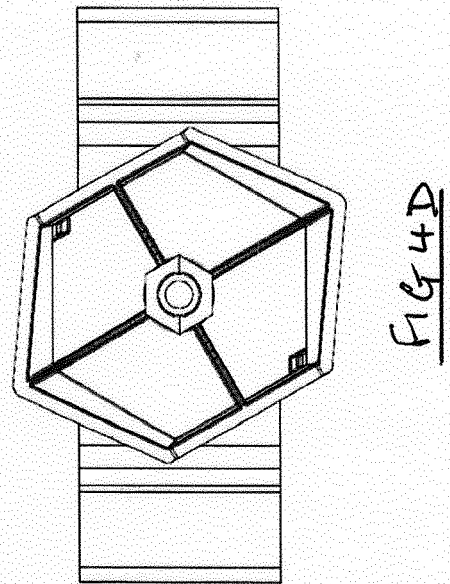
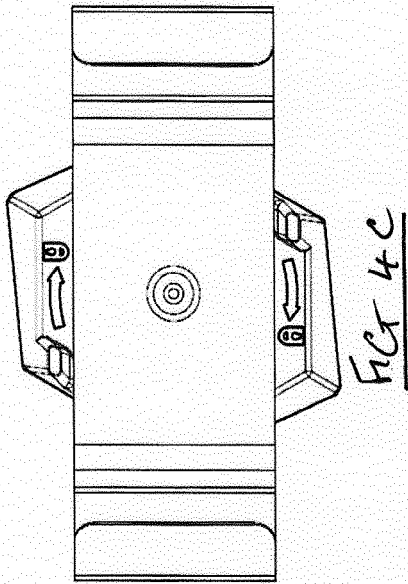
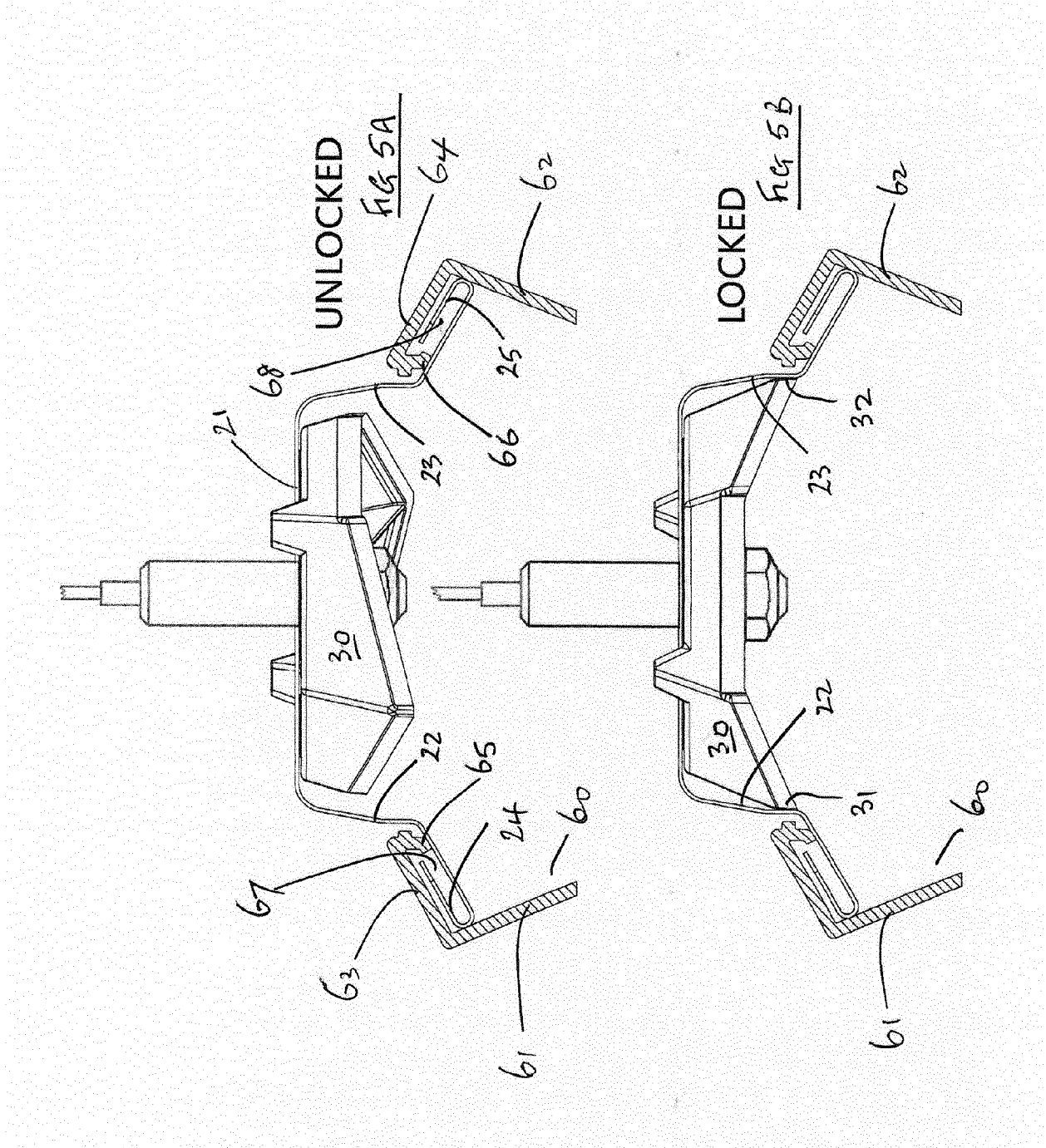


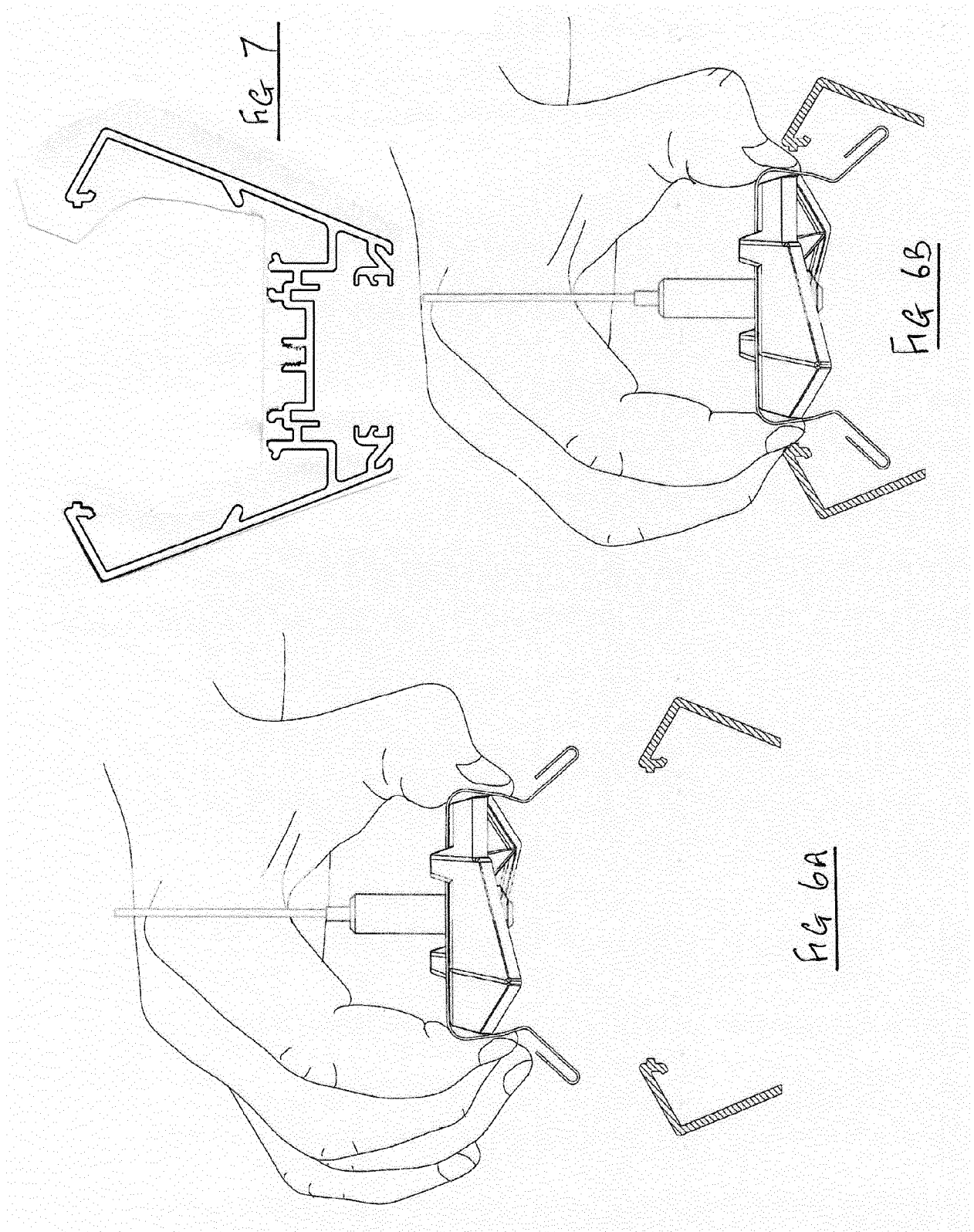
FIG 1C













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Place of search The Hague		Date of completion of the search 13 June 2019	Examiner Krikorian, Olivier
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