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(54) **A HINGE FOR A WINDOW, A WINDOW INCLUDING A SET OF SUCH HINGES, AND A METHOD OF INSTALLING SUCH A WINDOW**

(57) In order to assist in mounting the hinge (210) on a window, the hinge comprises a mounting arrangement (250) including two mounting plates (251, 252) to be arranged on the frame of the window. The mounting arrangement includes at least one set of coupling means (253, 254) configured to engage with corresponding coupling means (263, 264) of the remaining components of the set of components of the hinge (210). The coupling means of the mounting arrangement (250) comprise at least one reception member (253, 254) provided on a respective mounting plate (251, 252) to engage with a respective engagement member (263, 264) of the coupling means of the remaining components by movement of the remaining components of the hinge substantially in parallel with said hinge plane to provide a releasable connection between the remaining components of the hinge (210) and the mounting plates (251, 252).

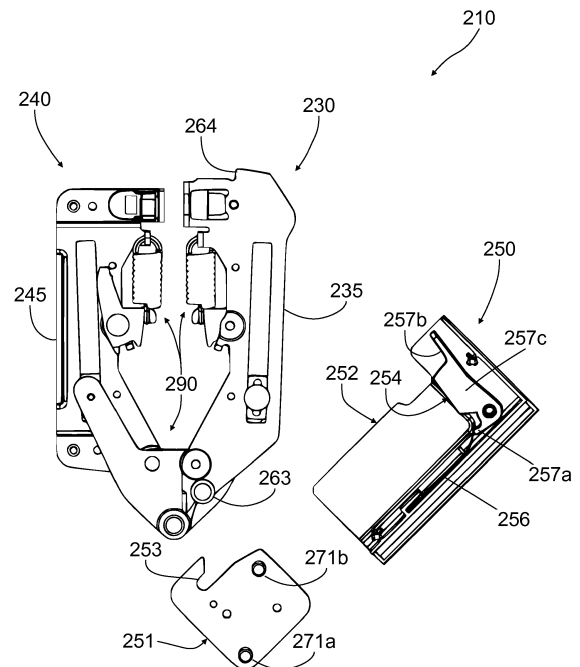


Fig. 8

## Description

### Field of the invention

**[0001]** The present invention relates to a hinge for a window having a frame and a sash, in which the hinge comprises a set of hinge components including a frame hinge part, a sash hinge part, a mounting arrangement and a plurality of movement supporting parts. The invention furthermore relates to a window including a set of hinges with a mounting arrangement, and to a method of installing such a window.

### Background art

**[0002]** Basically, windows may be provided in a number of varieties and include more or less complicated structures in order to allow opening of the sash and to fulfil other functions, such as ventilation, while permitting cleaning of the outside of the pane from inside the building. The varieties include windows configured for installation in an inclined roof, of which one variety is roof windows of the pivoting type, the hinge axis being either located at the centre or displaced from the centre of the window, and top-hung roof windows that pivot for cleaning by means of an intermediate frame.

**[0003]** These requirements are made possible by the provision of a hinge with a particular pattern of movements, which in turn makes it possible to establish an overlap between the covering elements fastened to the frame and the counterpart covering elements fastened to the sash in the closed position of the roof window.

**[0004]** One very well-proven type of hinge is the pivot hinge including a guidance on the frame hinge part cooperating with a slide rail on the sash hinge part. Such pivot hinges are for instance disclosed in Applicant's EP 1 038 083 B1 and EP 1 781 883 B1, and are very versatile as regards operational areas and adaptation of components. Examples of roof windows incorporating such adapted hinges are shown in Applicant's published European patent applications EP 2 770 146 A1 and EP 2 770 149 A1.

**[0005]** However, as the traditional pivot hinges to some extent rely on frictional forces to operate correctly, it is desirable to utilize an alternative configuration of the hinge in certain fields of application, in which the desired pattern of movements is provided by a linkage mechanism. The use of such hinges, known as so-called pantograph hinges, including linkage mechanisms is traditionally most often known from the furniture field, but such hinges are also well-known to use for roof windows. Prior art examples include Danish patent No. 114 321, US patent No. 4,446,597, and Applicant's European patents EP 22 657 B1 and EP 89 813 B1, and co-pending international application WO 2017/076416 A1.

**[0006]** Mounting a hinge comprising a linkage mechanism can be a challenge, since the frame hinge part and the sash hinge part are inherently connected to each other

via the linkage mechanism itself. Subsequently, mounting the window sash to the frame may be heavy and tricky for one person to do, considering that during the step of installing the window sash, the installation person must hold the window sash in place and fasten the hinge at the same time. The installation process is complicated by the limited available space, as the set of hinges needs to be positioned between the sash and the frame, in a gap that for apparent reasons needs to be as small as possible, thus restraining the degree of freedom for transverse movements, i.e. in directions perpendicular to the hinge plane defined by the base plate of the frame hinge part. Further, once the window is installed it is difficult to have the window sash removed of the same reason as mentioned above without involving more than one person. Therefore, there is a need for an improved solution to install a window, in particular as regards connecting the hinge to the window frame.

### Summary of the invention

**[0007]** With this background it is an object of the present invention to improve a hinge of the kind mentioned in the introduction with respect to the overall mounting conditions.

**[0008]** In a first aspect, this and further objects are met by the provision of a hinge having the features mentioned in the preamble to claim 1, which is characterised in that the mounting arrangement comprises at least one mounting plate, adapted to be arranged on the frame member substantially in parallel to the base plate of the frame hinge part in the mounted condition, and at least one set of coupling means configured to engage with corresponding coupling means of the remaining components of the set of components of the hinge, wherein the coupling means of the mounting arrangement comprise at least one reception member provided on the at least one mounting plate to engage with a respective engagement member of the coupling means of the remaining components of the hinge by movement of the remaining components of the hinge substantially in parallel with said hinge plane to provide a releasable connection between the remaining components of the hinge and the at least one mounting plate.

**[0009]** By providing the mounting arrangement with one or more mounting plates to be initially provided on the frame member, it is possible to achieve the facilitated installation of the window aimed at. A hinge including a mounting arrangement of this type thereby facilitates bringing the hinge from a supply condition to a mounted condition. The mutual engagement of the coupling means of the remaining components of the hinge with the coupling means of the mounting arrangement is easily carried out while at the same time taking place only in a plane parallel with the hinge plane. In this way, no transverse movements are required for attaining the releasable connection. Further, using a prefabricated mounting plate allows the installation to be accurate every time,

taking positions and tolerances into account. Moreover, the provision of a mounting plate or mounting plates allows for connection and disconnection without the risk of destroying components of the hinge or any parts of the window when repeatedly being connected and disconnected. This is because the mounting plate may be configured to allow for repeatedly connecting and disconnecting of the window without the use of any penetrating or threaded fastening elements introduced into the material of the window itself and that may cause rupture. The coupling means may be configured without the use of loose fastening elements. By avoiding loose fastening elements, the installation of a window is facilitated even further since the complete installation may be done by one person, without the need for reaching out for fastening means such as screws etc. This type of installation using mounting plates is especially suitable when installing windows in challenging working positions, such as is often the case with roof windows. Since the window may be situated at an inclination and may involve working positions over the head, which are known to cause back and neck strain, it is a great advantage that the installation procedure is facilitated. It is noted that by the term "installation of a window" it is understood that this encompasses assembly of various components constituting or forming a window.

**[0010]** The definitions of "frame" and "sash" should be interpreted as encompassing any structure fulfilling the requirements of acting as parts in an openable window. Although the mounting plate of the mounting arrangement is described as being configured for arrangement on the stationary frame, it is also conceivable to mount the hinge inversely, i.e. connecting the mounting plate or plates on the movable sash, or other movable frame, and arranging the remaining components of the set of hinge components on the frame. The coupling procedure is then carried out in a manner corresponding to the one described.

**[0011]** The terms "remaining components of the set of hinge components" and "remaining components of the hinge" are used interchangeably. In the present context, the term "remaining components of the hinge" encompasses any component forming part of the hinge excluding the mounting plate or plates and parts associated thereto.

**[0012]** In one presently preferred embodiment, a first engagement member of the coupling means of the remaining components of the hinge is a bolt provided on the base plate of the frame hinge part, and a first reception member is a slot in the at least one mounting plate adapted to receive the bolt to provide an at least temporary retention of the remaining components of the hinge relative to the at least one mounting plate. Preferably, the coupling takes place by first sliding the bolt into the slot and subsequently rotating the base plate of the frame hinge part and the other remaining components of the hinge about the bolt. Initial engagement of these coupling means is logical, and during installation of the window,

the installer is supported in that once the coupling has been obtained, the weight of the sash is sustained by the mounting plate connected to the frame. The weight of the sash is often substantial, since the sash is carrying not only the remaining components of the hinge but also the pane.

**[0013]** In another presently preferred embodiment, a second engagement member of the coupling means of the remaining components comprises a shoulder portion, and the second reception member of the coupling means of the mounting arrangement comprises a spring-biased latch element provided with an abutment portion to engage with said shoulder portion in the mounted condition. In this manner, secure engagement of the respective coupling means is ensured as a logical step during installation.

**[0014]** In a further presently preferred embodiment, the mounting arrangement comprises a first mounting plate and a second mounting plate. This opens up to a more flexible configuration of the mounting arrangement and associated details.

**[0015]** In a second aspect, a window including a set of hinges is provided, and in a third aspect, a method of installing such a window is provided.

**[0016]** Other presently preferred embodiments and further advantages will be apparent from the following detailed description and the dependent claims.

#### Brief description of drawings

**[0017]** The invention will be described in more detail below by means of non-limiting examples of embodiments and with reference to the schematic drawing, in which

Fig. 1 is a perspective view of a prior art window;  
 Fig. 2 is an exploded front view of a hinge in a first embodiment of the invention, shown in a position corresponding to an initial step of an installation process;  
 Figs 3a and 3b are exploded perspective views of a hinge in the first embodiment of the invention, from different angles;  
 Fig. 4 is an exploded perspective view of a hinge in the first embodiment of the invention, showing the relationship of the hinge with the window frame;  
 Fig. 5 is a view corresponding to Fig. 2, of a hinge in a second embodiment of the invention;  
 Figs 6a, 6b, 7a and 7b are perspective views of details a hinge in the second embodiment of the invention, from different angles;  
 Fig. 8 is a view corresponding to Fig. 2 and Fig. 5, of a hinge in a third embodiment of the invention; and  
 Figs 9a, 9b, 10a, 10b, 11 a, 11 b, 12a, 12b, 13a, 13b, 14a and 14b are all views showing details of the hinge in the third embodiment of the invention.

### Detailed description of the invention

**[0018]** In the following, embodiments of the inventive hinge generally designated 10 will be described in further detail. For reference, a window with a prior art hinge 10' is shown in Fig. 1. Such a hinge 10' and other parts of the window which are applicable also to a window according to the invention are described in Applicant's published European patent applications EP 2 770 146 A1 and EP 2 770 149 A1 to which reference is hereby explicitly made. It is hence to be understood that the hinge 10 and mounting arrangement according to the invention replaces the prior art hinge 10' at one or both sides of the window.

**[0019]** In a manner known *per se*, the window comprises a sash 2 carrying a glazing in the form of a pane 3 and a frame 1. The window is intended to be built into a surface, which is inclined with respect to the horizontal, typically a roof, and the window will in the following be referred to as roof window. At a position between the top and centre of the window, there is a hinge connection between the frame 1 and the sash 2. The hinge connection in Fig. 1 comprises a set of two prior art hinges, of which one hinge 10' is visible. The frame 1 and sash 2 is each formed by four members of which one frame side member 1 a and one sash side member 2a are indicated. The sash 2 is openable with respect to the frame 1, as the sash 2 may be moved from a closed position, in which e.g. the sash side member 2a is substantially parallel with the frame side member 1 a, to an open position, in which the sash side member 2a forms an angle with the frame side member 1 a. During this movement the sash 2 rotates about a hinge axis  $\alpha$  situated at the hinge connection. As indicated in Fig. 1, the hinge axis  $\alpha$  is located between a centre axis and the top of the roof window, preferably in the interval 1/3 to 2/3 of the distance between the centre axis and the top, most preferred substantially at 1/2 of the distance between the centre axis and the top. Other positions of the hinge axis are of course conceivable, for instance at the centre of the roof window. A corresponding operation of the window as described above and from here on is also true for the type of hinge described in the Applicant's co-pending international application published under WO 2017/076416 A1. Common to the hinge types applicable in such windows is that a number of movement supporting parts are provided in the hinge, as will be described further below.

**[0020]** To protect the interior and the components of the window itself and to ascertain weather-proof transition to the surrounding roofing, the roof window comprises a covering, including flashing members (not shown), cladding and covering elements of which a frame side covering element 1b and sash side covering element 2b are shown.

**[0021]** From a closed position, the user operates the operating device of the window. The operating device typically comprises a handle (not shown) connected with the sash bottom member and/or an operating and locking

assembly including a ventilation flap at the sash top member with a lock mechanism to interact with a striking plate on the frame top member. The hinge 10 exerts a moment on the sash 2, and in combination with the force, and hence moment, exerted by the user operating the operating device, the moment resulting from the weight of the sash 2 and pane 3 is overcome, along with any frictional forces present. All in all, the opening operation entails that the sash 2 is moved from a closed position to an open position as represented by Fig. 1, in which the sash plane forms an opening angle with the frame plane. Closing the window from the open position entails the opposite movement of the sash 2. It is possible to position the sash 2 in a number of arbitrary opening positions, in which the sash 2 is held stable relative to the frame 1. The sash 2 is also able to be rotated substantially through 180° to allow cleaning of the outside of the pane 3 from the inside of the building in which the roof window is installed.

**[0022]** Referring now to Figs 2 to 4, a first embodiment of a hinge 10 according to the invention will be described in detail.

**[0023]** When referring to the Figures, the terms up, down, upwards, downwards, top and bottom are taken relative to how the figures are displayed, that is having the frame arranged in a lying position with the covering elements facing upwards. A front view is taken from the hinge and viewing towards the frame. A view from behind is therefore taken as viewed from the frame towards the hinge. A longitudinal direction is, if nothing else is mentioned, longitudinal along the length of the frame member. It is to be understood that the arrangement shown in a horizontal orientation is not the normal orientation as the window is installed in an inclined roof.

**[0024]** In Fig. 2, the hinge 10 is shown in a position corresponding to an initial step of an installation process. This position also corresponds to a supply condition of the hinge according to the invention. The hinge 10 comprises a frame hinge part 30 and a sash hinge part 40 configured to assume an angle relative to the frame hinge part 30. The hinge 10 forms part of a set of hinges, of which the frame hinge part 30 of each hinge 10 is configured to be connected to the frame side member 1 a of the frame 1 of the roof window (cf. Fig. 4) in a mounted condition by a mounting arrangement to be described in further detail, at a location chosen to provide the desired position of the hinge axis  $\alpha$ , and the sash hinge part 40 is correspondingly configured to be connected to the sash side member 2a.

**[0025]** As in the prior art hinge 10', the base plate 35 of the frame hinge part 30 defines a hinge plane substantially perpendicular to the hinge axis  $\alpha$  of the window in the mounted condition of the hinge, the base plate 45 of the sash hinge part 40 being substantially parallel to the base plate 35 of the frame hinge part 30. The hinge 10 moreover comprises a plurality of movement supporting parts 90, connected to a respective base plate 35, 45 of the frame hinge part 30 and the sash hinge part 40, and configured to allow the sash hinge part 40 to assume an

angle relative to the frame hinge part 30. In the specific embodiments shown and described, the movement supporting parts 90 comprises a linkage mechanism including links, springs and at least one pick-up element to provide the hinge as a pantograph hinge. For a description of the parts and operation of such a pantograph hinge, explicit reference is hereby made to the embodiment shown in and described in relation to Figs 2 to 5 of the above-mentioned WO 2017/076416 A1. In principle, however, the fundamental principles of the invention are also applicable to traditional pivot hinges including an arc-shaped guidance on the frame hinge part to receive an arc-shaped slide on the sash hinge part.

**[0026]** A mounting arrangement generally designated 50 comprises a mounting plate 51 which is shown in the position it will take in the mounted condition of the hinge, cf. again Fig. 4, on the frame side member 1a with fastening means which can be for example pins or spigots 71, 72, or any type of threaded fastening means. The spigots 71, 72 are arranged in corresponding holes 73, 74 on the mounting plate 51 and mounting holes 76, 77 in a recess 75 of the frame side member 1 a. Preferably, the spigots 71, 72 are arranged such that they end in flush with an outer surface 51 a of the mounting plate 51 in order to avoid collision with the components of the frame hinge part 30. The outer surface 51 a is the surface of the mounting plate 51 that faces away from the frame side member 1 a, an inner surface 51 b facing the frame side member 1 a in the mounted condition. The base plate 45 of the sash hinge part 40 is provided with corresponding spigots (not described in detail).

**[0027]** The remaining components of the hinge 10 shown in Fig. 2, i.e. the base plate 35 of the frame hinge part 30, the movement supporting parts 90 and the sash hinge part 40 with its base plate 45, are in a position corresponding to that the sash (not shown) would have in this initial step of installation, namely substantially vertical. This position also corresponds to the supply condition of the hinge, in which these remaining components are all connected to the sash. Hence, in the supply condition, only the mounting plate (or mounting plates, if more than one) of the hinge is fastened to the frame.

**[0028]** This initial step is common to the first embodiment, the second embodiment (cf. Fig. 5) and the third embodiment (cf. Fig. 8). Elements having the same or analogous function as in the first embodiment are provided with the same reference numerals to which 100 and 200, respectively, have been added. The operational principles underlying the invention are thus based on the following fundamental features, referring now jointly to Figs 2, 5 and 8:

**[0029]** The mounting arrangement 50; 150; 250 has one or more mounting plates 51; 151; 251, 252 arranged on the frame member 1a substantially in parallel to the base plate 35; 135; 235 of the frame hinge part 30; 130; 230 in the mounted condition. At least one set of coupling means 53, 54; 153, 154; 253, 254 is configured to engage with corresponding coupling means 63, 64; 163, 164;

263, 264 of the remaining components of the set of components of the hinge 10; 110; 210. The coupling means of the mounting arrangement 50; 150; 250 comprise at least one reception member 53, 54; 153, 154; 253, 254 provided on the at least one mounting plate 51; 151; 251, 252 to engage with a respective engagement member 63, 64; 163, 164; 263, 264 of the coupling means of the remaining components by movement of the remaining components of the hinge substantially in parallel with said hinge plane to provide a releasable connection between the remaining components of the hinge 10; 110; 210 and the at least one mounting plate 51; 151; 251, 252.

**[0030]** In all three shown embodiments, a first engagement member of the coupling means of the remaining components of the hinge is a bolt 63; 163; 263 provided on the base plate 35; 135; 235 of the frame hinge part 30; 130; 230, and a first reception member is a slot 53; 153; 253 in one of the mounting plates 51; 151; 251 adapted to receive the bolt 63; 163; 263. It is preferred that from the position shown in Figs 2, 5 and 8, the remaining components of the hinge are moved downwards and the bolt 63; 163; 263 is first slid into the slot 53; 153; 253. Subsequently the base plate 35; 135; 235 of the frame hinge part 30; 130; 230 and the other remaining components of the hinge 10; 110; 210 are rotated about the bolt 63; 163; 263 to provide an at least temporary retention of the remaining components of the hinge relative to the at least one mounting plate 51; 151; 251.

**[0031]** It is noted that during the entire movement, the respective planes of the mounting plate and the base plates of the frame hinge part and the sash hinge part are at all times kept substantially parallel, thus avoiding transverse movements perpendicular to the hinge plane as defined by the base plate 35; 135; 235 of the frame hinge part 30; 130; 230.

**[0032]** Following the engagement of the coupling means of remaining hinge components with the coupling means of the mounting arrangement as described in the above, the window sash is in "safe position", as the weight of the sash is transferred to the frame via the mounting arrangement. The installer is thus in principle free to leave the window at least temporarily.

**[0033]** An increased security against unintentional release is however increased if also a secondary coupling is present. In the first embodiment, a second engagement member of the coupling means of the remaining components of the hinge 10 is a flange 64 provided on the base plate 35 of the frame hinge part 30 and a second reception member is a longitudinal groove 54 in the mounting plate 51 adapted to receive said flange 64 by sliding the flange 64 into the longitudinal groove 54. Once the flange 64 has been received in the groove 54, the mounted condition has been reached.

**[0034]** In the first embodiment, the mounting may be supplemented using at least one additional, separate locking device (not shown) configured to prevent unwanted release of the engagement of the remaining components of the hinge with the mounting plate or plates in

the mounted condition of the hinge. In practice, this means that the hinge frame part is prevented from moving relative to the mounting plate when mounted. The locking devices may involve one or more of the following: a key, a wedge, a hook and catch and a spring load type locking device, or some other suitable arrangement that may prevent unwanted movement between the remaining components of the hinge and the mounting plate. Alternatively, the mounting arrangement may involve a snap lock or a click lock of suitable kind. The snap or a click lock may be provided by a spring loaded stop. The locking device may be incorporated in the hinge or mounting arrangement in order to avoid the use of loose fastening elements. The locking device may involve a safety feature incorporated in the bolt and slot. For instance, the bolt may have a shape and be arranged to permit a rotation of the bolt to lock within the slot. It is also conceivable to utilise parts of the window covering for locking the set of hinge components relative to each other in the mounted condition of the hinge. Examples of locking devices are conceivable to the person skilled in the art.

**[0035]** In the second and third embodiments, a second engagement member of the coupling means of the remaining components comprises a shoulder portion 164; 264, and the second reception member of the coupling means of the mounting arrangement 150; 250 comprises a spring-biased latch element 154; 254 provided with an abutment portion 155; 255 to engage with said shoulder portion 164; 264 in the mounted condition.

**[0036]** As shown, the spring-biased latch element 154; 254 is here connected to the mounting plate in question, the mounting plate 151 in the second embodiment, and a second mounting plate 252 in the third embodiment, in a pivotal connection 159; 259.

**[0037]** The spring-bias of the latch element 154; 254 is specifically provided by a leaf spring 156; 256 and the latch element 154; 254 includes a spring engagement portion 157a; 257a. As shown in detail only in connection with the third embodiment, the leaf spring 256 is received in a spring pocket 256a of the second mounting plate 252. Other means of accommodating the leaf spring are conceivable.

**[0038]** The provision of the spring-biased latch element 154; 254 ensures a simple, precise and reliable secondary coupling between the remaining hinge components and the mounting arrangement such that the releasable connection is achieved in a "semi-automatic" step when rotating the sash relative to the frame during installation.

**[0039]** In order to be able to release the engagement in an easy manner, the spring-biased latch element 154; 254 in the specific second and third embodiments includes a tongue portion 157b; 257b acting as a handle for release of the releasable connection.

**[0040]** A further detail of the latch element 154; 254 is the presence of a guide portion 157c; 257c. The guide portion 157c; 257c is particularly useful during installation, i.e. activation of the releasable connection, and

when releasing the connection.

**[0041]** One difference between the second and third embodiments is that in the third embodiment, the mounting arrangement 250 comprises a first mounting plate 251 and the second mounting plate 252 mentioned above. Referring also to the above description, it is apparent that the first reception member 253 is positioned in the first mounting plate 251 and the second reception member in the form of spring-biased latch element 254 is associated to the second mounting plate 252.

**[0042]** Another difference is that the second mounting plate 252 comprises a cover portion 258 ensuring that the operational parts of the mounting arrangement are hidden to the user. In principle, the only exception is the tongue portion 257b acting as a handle for release of the connection which is accessible to the user. It is noted that the provision of a cover portion is also conceivable in connection with the second embodiment.

**[0043]** The fastening of the respective mounting plates 251, 252 to the frame side member is ensured in substantially the same way as with the one-piece mounting plates of the first and second embodiment, namely via spigots 271 a, 271 b on the first mounting plate 251, and spigots 272a, 272b on the second mounting plate 252. Only holes 273, 274 in the first mounting plate 251 for spigots 271 a, 271 b are shown. It is for instance conceivable to form the second mounting plate 252 in one-piece as a moulded part of a suitable plastic material, including the cover portion 258 and the spigots 272a, 272b.

**[0044]** It is to be understood that the locking and the mounting may differ depending on the specific installation and the specific hinge. The hinge with mounting arrangement described may also be suitable for any window, including roof windows at any inclination and façade windows of any size. Also some different shapes when possible to use a hinge as the one described.

**[0045]** It should be noted that the above description of preferred embodiments serves only as an example, and that a person skilled in the art will know that numerous variations are possible without deviating from the scope of the claims.

#### List of reference numerals

##### **[0046]**

- 1 frame
  - 1a frame side member
  - 1b frame covering element
- 2 sash
  - 2a sash side member
  - 2b sash covering element
- 3 pane

1<sup>st</sup> embodiment:

##### **[0047]**

10	hinge			3 <sup>rd</sup> embodiment:
30	frame hinge part			<b>[0049]</b>
	35 base plate			
40	sash hinge part	5	210	hinge
	45 base plate		230	frame hinge part
50	mounting arrangement			235 base plate
	51 mounting plate			240 sash hinge part
	51 a outer surface			245 base plate
	51b inner surface set of coupling means of mounting arrangement:	10	250	mounting arrangement
	53 first reception member / slot			251 first mounting plate
	54 second reception member / groove coupling means of remaining components of set of hinge components:			252 second mounting plate set of coupling means of mounting arrangement:
	63 first engagement member / bolt	15		253 first reception member / slot
	64 second engagement member / flange			254 second reception member / latch element
71	fastening means / spigot			255 abutment portion
72	fastening means / spigot			256 leaf spring
73	hole in mounting plate for spigot 71			256a spring pocket
74	hole in mounting plate for spigot 72	20		257a spring engagement portion of latch element
75	recess			257b tongue portion
76	mounting hole			257c guide portion
77	mounting hole			258 cover portion
				259 pivotal connection coupling means of remaining components of set of hinge components:
90	movement supporting parts			263 first engagement member / bolt
				264 second engagement member / shoulder portion
				265 protruding bottom portion
				271a spigot on first mounting plate
				271b spigot on first mounting plate
				272a spigot on second mounting plate
				272b spigot on second mounting plate
				35 273 hole in mounting plate for spigot 271 a
				274 hole in mounting plate for spigot 271 b
				290 movement supporting parts
				40 $\alpha$ hinge axis
				<b>Claims</b>
				45 <b>1.</b> A hinge (10; 110; 210) for a window having a frame (1) and a sash (2) and adapted to define a hinge axis ( $\alpha$ ) of the window, said hinge comprising a set of hinge components including:
				50 a frame hinge part (30) having a base plate (35) configured to be connected to a frame member (1 a) of the frame;
				a sash hinge part (40) having a base plate (45) configured to be connected to a sash member (2a) of the sash;
				55 a mounting arrangement (50; 150; 250) configured to assist in bringing the hinge (10) from a supply condition to a mounted condition, in
110	hinge			
130	frame hinge part			
	135 base plate			
	140 sash hinge part			
	145 base plate			
	150 mounting arrangement			
	151 mounting plate			
	151a outer surface			
	151b inner surface set of coupling means of mounting arrangement:			
	153 first reception member / slot			
	154 second reception member / latch element			
	155 abutment portion			
	156 leaf spring			
	157a spring engagement portion			
	157b tongue portion			
	157c guide portion			
	159 pivotal connection coupling means of remaining components of set of hinge components:			
	163 first engagement member / bolt			
	164 second engagement member / shoulder portion			
	165 protruding bottom portion			
173	hole in mounting plate for spigot			
174	hole in mounting plate for spigot			
190	movement supporting parts			

which the base plate (35) of the frame hinge part (30) is connected to the frame member (1 a) and the base plate (45) of the sash hinge part (40) to the sash member (2a); and

a plurality of movement supporting parts (90), connected to a respective base plate (35, 45) of the frame hinge part (30) and the sash hinge part (40), and configured to allow the sash hinge part (40) to assume an angle relative to the frame hinge part (30),

in which the base plate (35) of the frame hinge part (30) defines a hinge plane substantially perpendicular to the hinge axis ( $\alpha$ ) of the window in the mounted condition of the hinge, the base plate (45) of the sash hinge part (40) being substantially parallel to the base plate (35) of the frame hinge part (30),

**characterised in that**

the mounting arrangement (50; 150; 250) comprises at least one mounting plate (51; 151; 251, 252), adapted to be arranged on the frame member (1a) substantially in parallel to the base plate (35; 135; 235) of the frame hinge part (30; 130; 230) in the mounted condition, and at least one set of coupling means (53, 54; 153, 154; 253, 254) configured to engage with corresponding coupling means (63, 64; 163, 164; 263, 264) of the remaining components of the set of components of the hinge (10; 110; 210), wherein the coupling means of the mounting arrangement (50; 150; 250) comprise at least one reception member (53, 54; 153, 154; 253, 254) provided on the at least one mounting plate (51; 151; 251, 252) to engage with a respective engagement member (63, 64; 163, 164; 263, 264) of the coupling means of the remaining components of the hinge substantially in parallel with said hinge plane to provide a releasable connection between the remaining components of the hinge (10; 110; 210) and the at least one mounting plate (51; 151; 251, 252).

2. A hinge according to claim 1, wherein a first engagement member of the coupling means of the remaining components of the hinge is a bolt (63; 163; 263) provided on the base plate (35; 135; 235) of the frame hinge part (30; 130; 230), and a first reception member is a slot (53; 153; 253) in said at least one mounting plate (51; 151; 251) adapted to receive said bolt (63; 163; 263), preferably by first sliding the bolt (63; 163; 263) into the slot (53; 153; 253) and subsequently rotating the base plate (35; 135; 235) of the frame hinge part (30; 130; 230) and the other remaining components of the hinge (10; 110; 210) about the bolt (63; 163; 263), to provide an at least temporary retention of the remaining components of the hinge relative to the at least one mounting plate (51;

151; 251).

3. A hinge according to claim 1 or 2, wherein a second engagement member of the coupling means of the remaining components of the hinge is a flange (64) provided on the base plate (35) of the frame hinge part (30) and a second reception member is a longitudinal groove (54) in the mounting plate (51) adapted to receive said flange (64) by sliding the flange (64) into the longitudinal groove (54).
4. A hinge (10) according to any one of the preceding claims, further comprising a separate locking device configured to prevent unwanted release of the engagement of the remaining components of the hinge (10) with the at least one mounting plate (51), the locking device being selected from the group comprising a key, a wedge, a hook and a catch and a spring load type locking device.
5. A hinge (110; 210) according to any one of claims 1 and 2, wherein a second engagement member of the coupling means of the remaining components comprises a shoulder portion (164; 264), and the second reception member of the coupling means of the mounting arrangement (150; 250) comprises a spring-biased latch element (154; 254) provided with an abutment portion (155; 255) to engage with said shoulder portion (164; 264) in the mounted condition.
6. A hinge (110; 210) according to claim 5, wherein the spring-biased latch element (154; 254) is connected to said at least one mounting plate (151; 252) in a pivotal connection (159; 259).
7. A hinge (110; 210) according to claim 5 or 6, wherein the spring-bias of the latch element (154; 254) is provided by a leaf spring (156; 256) and the latch element (154; 254) includes a spring engagement portion (157a; 257a), the at least one mounting plate (252) preferably including a spring pocket (256a).
8. A hinge (110; 210) according to claim 7, wherein the base plate (135; 235) of the frame hinge part (130; 230) is provided with a protruding bottom portion (165; 265) to interact with the leaf spring (156; 256).
9. A hinge (110; 210) according to any one of claims 5 to 8, wherein the spring-biased latch element (154; 254) includes a tongue portion (157b; 257b) acting as a handle for release of the releasable connection.
10. A hinge (110; 210) according to any one of claims 5 to 9, wherein the spring-biased latch element (154; 254) includes a guide portion (157c; 257c).
11. A hinge (210) according to any one of claims 5 to 10, wherein the mounting arrangement (250) com-



prises a first mounting plate (251) and a second mounting plate (252).

12. A hinge (210) according to claim 10, wherein the second mounting plate (252) comprises a cover portion (258). 5
13. A hinge (10; 110; 210) according to any one of the preceding claims, wherein the movement supporting parts (90) of the hinge comprises a linkage mechanism including links, springs and at least one pick-up element to provide the hinge as a pantograph hinge. 10
14. A window including a set of hinges (10; 110; 210) according to any one of claims 1 to 13, comprising a frame (1) having a top member, a bottom member and two side members (1a) defining a frame plane, a sash (2) having a top member, a bottom member and two side members (2a), said sash carrying a pane (3) and defining a sash plane, said set of hinges (10) defining the hinge axis ( $\alpha$ ) of the window. 15  
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15. A method of installing a window according to claim 14, comprising the steps of: 25
- connecting the at least one mounting plate to the frame,
- connecting the remaining components of the set of components of the hinge to the sash, and 30
- engaging the coupling means of the remaining components with the coupling means of the mounting arrangement by moving the remaining components of the hinge substantially in parallel with said hinge plane. 35

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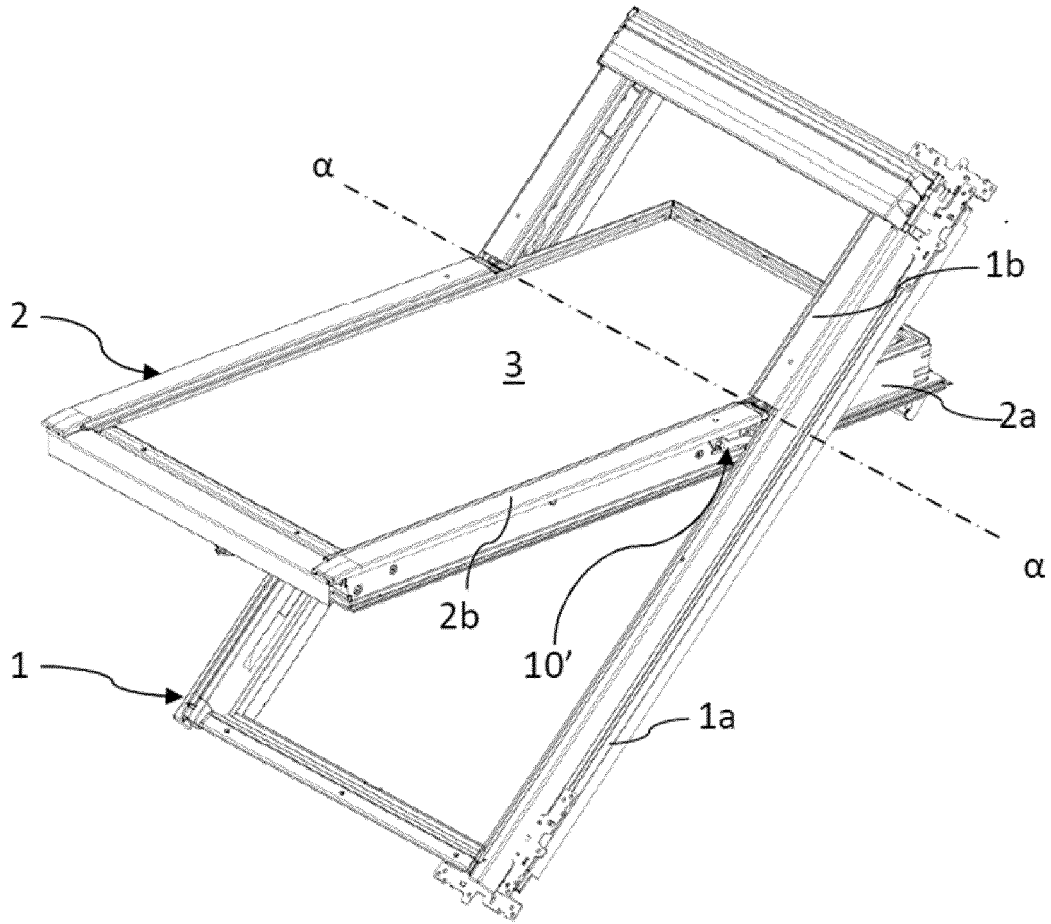


Fig. 1

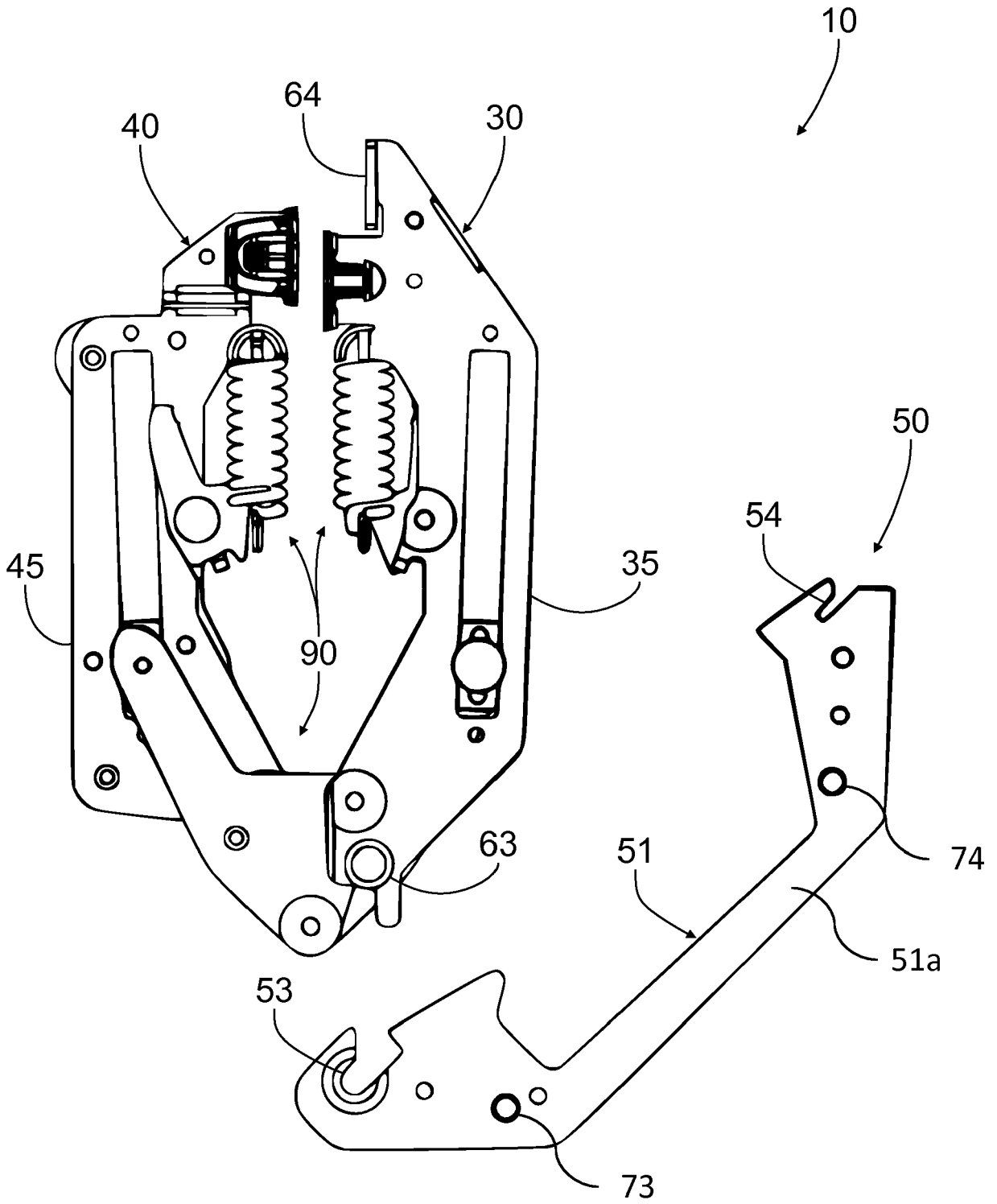


Fig. 2

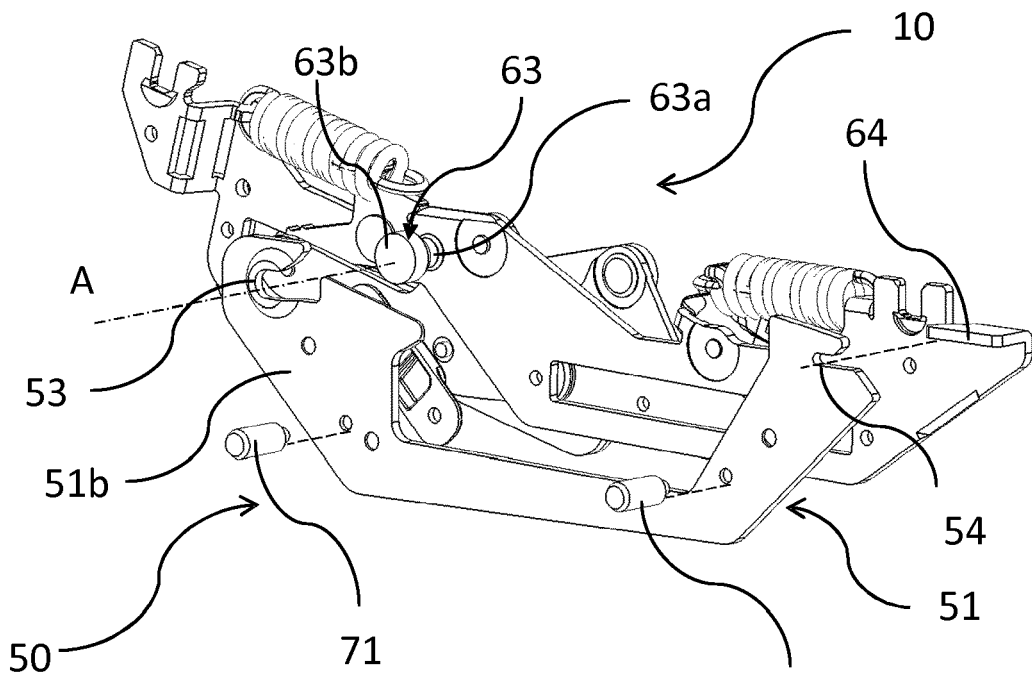


Fig. 3a

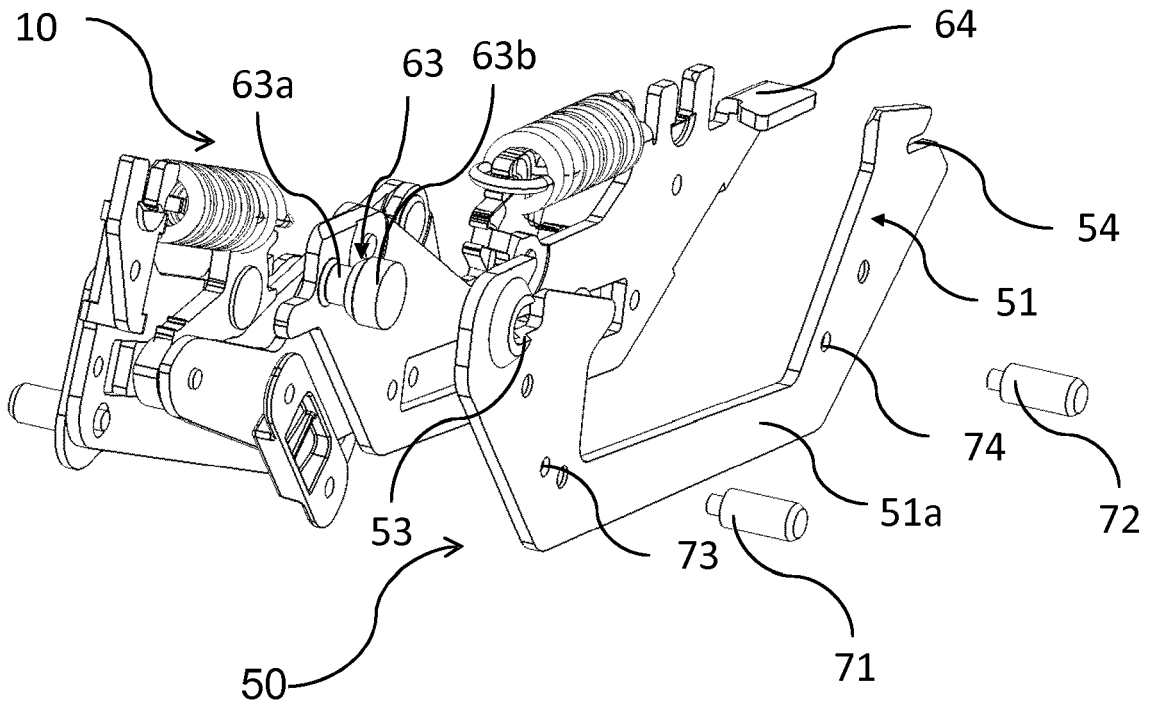


Fig. 3b

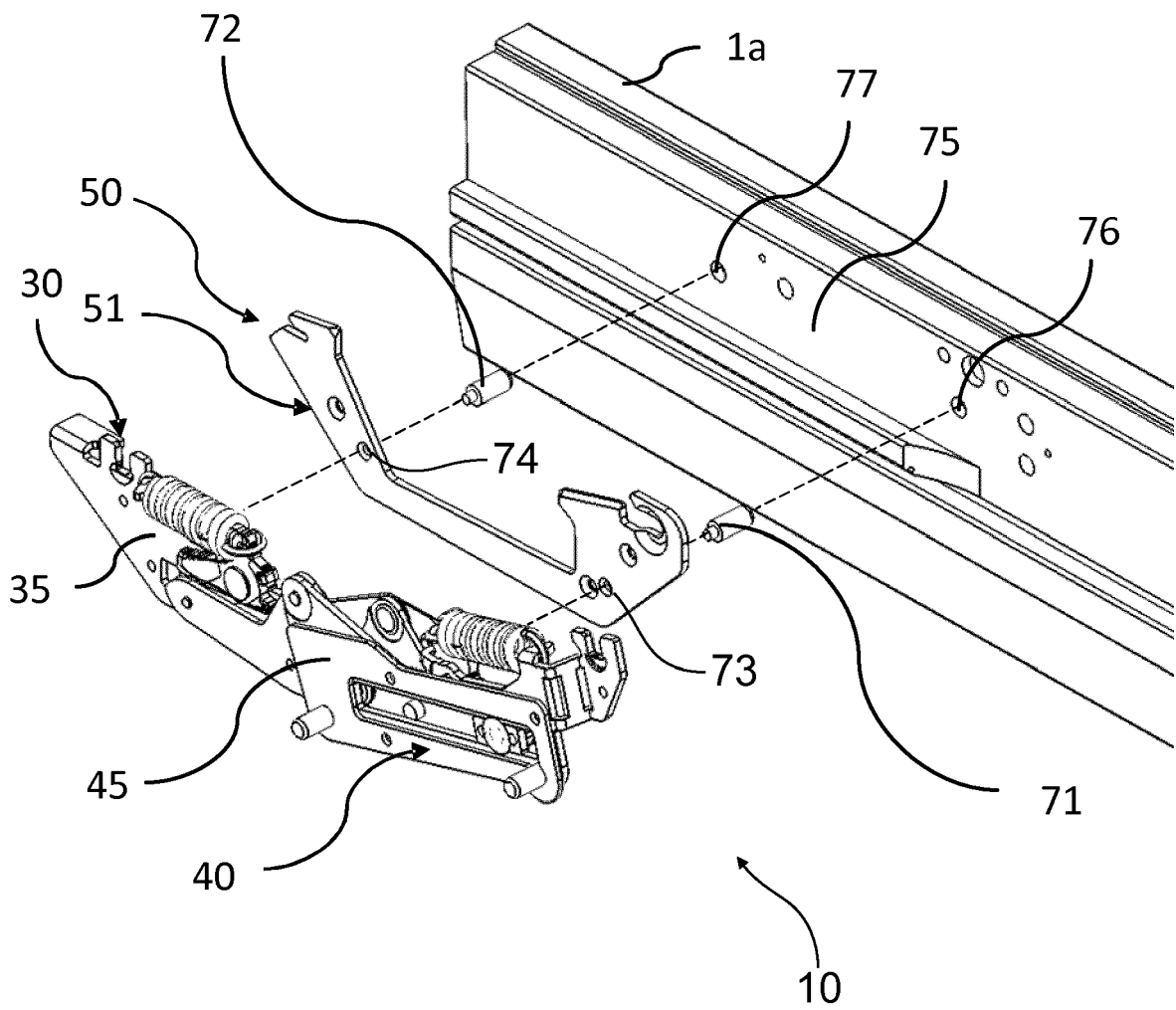


Fig. 4

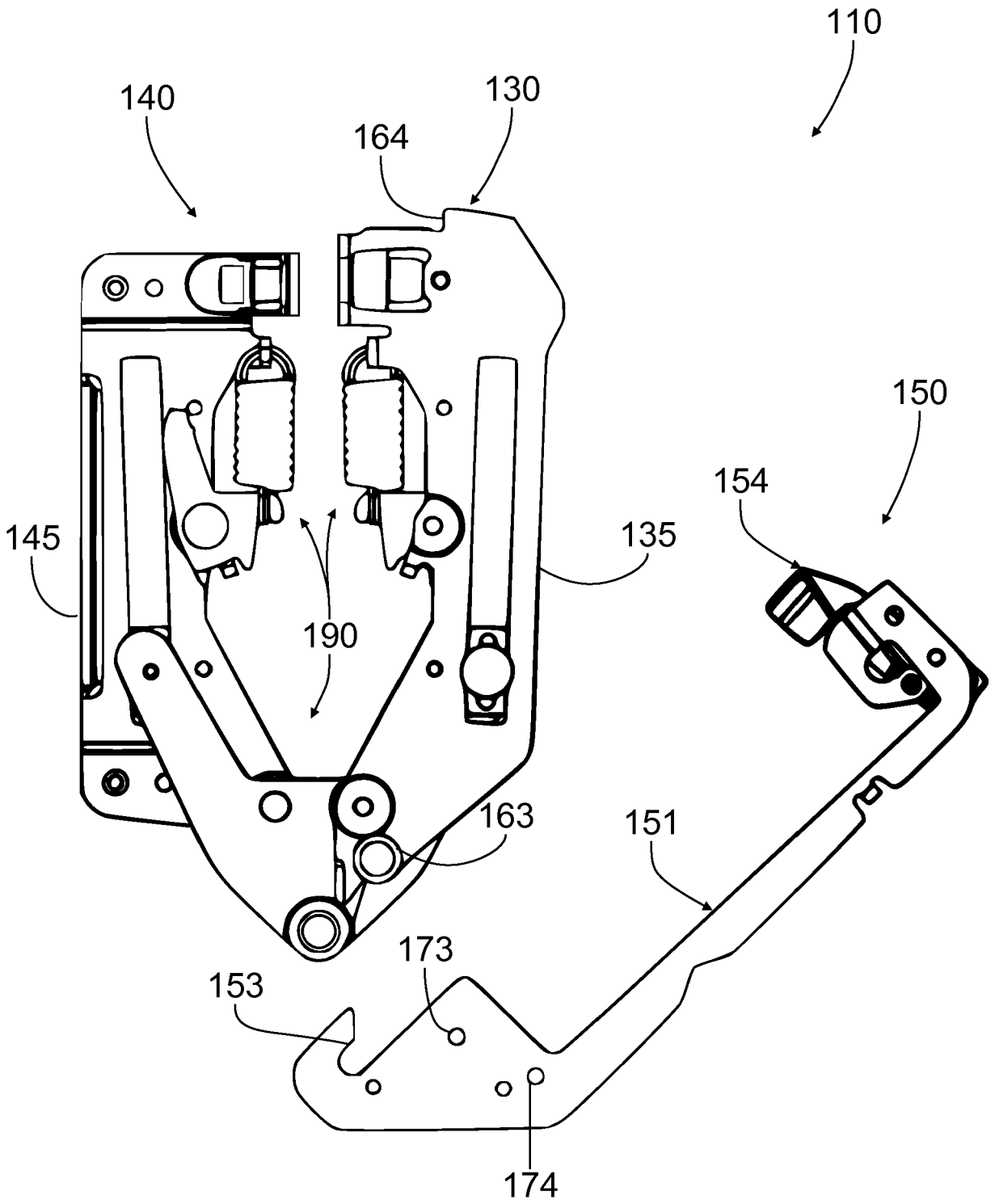


Fig. 5

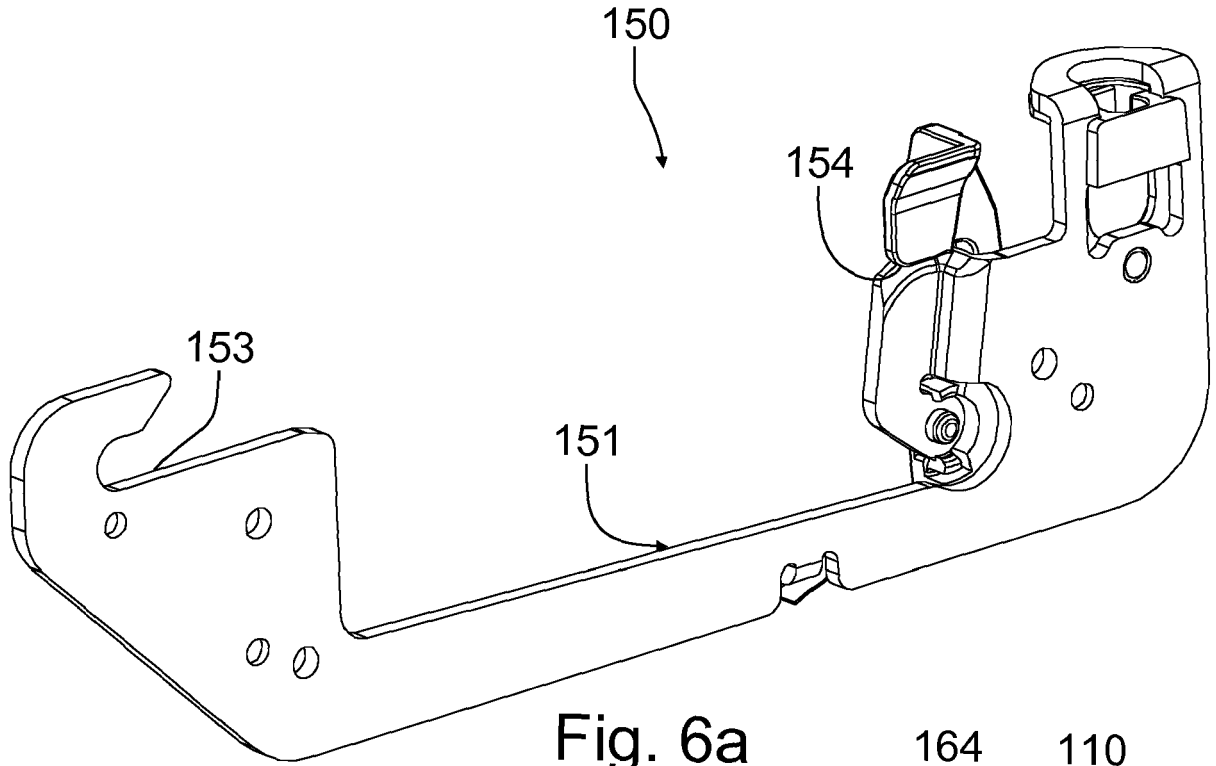


Fig. 6a

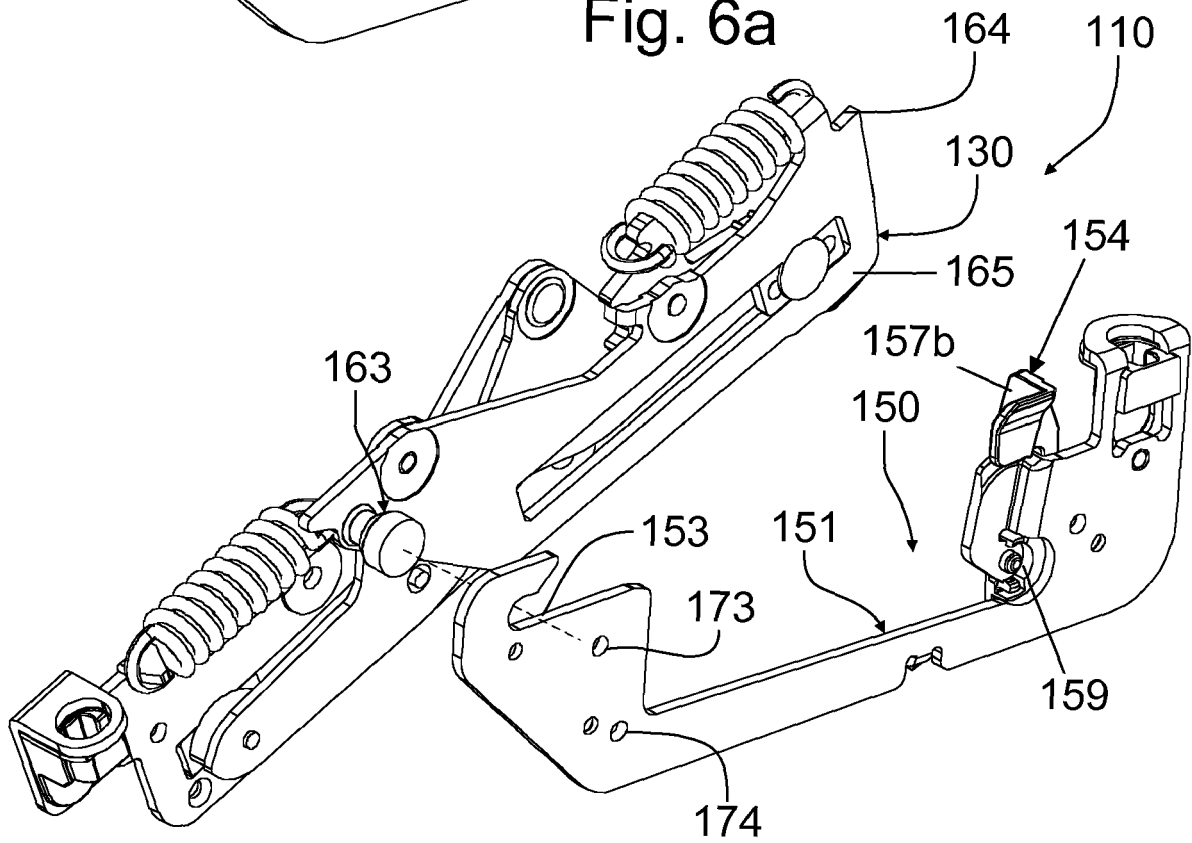
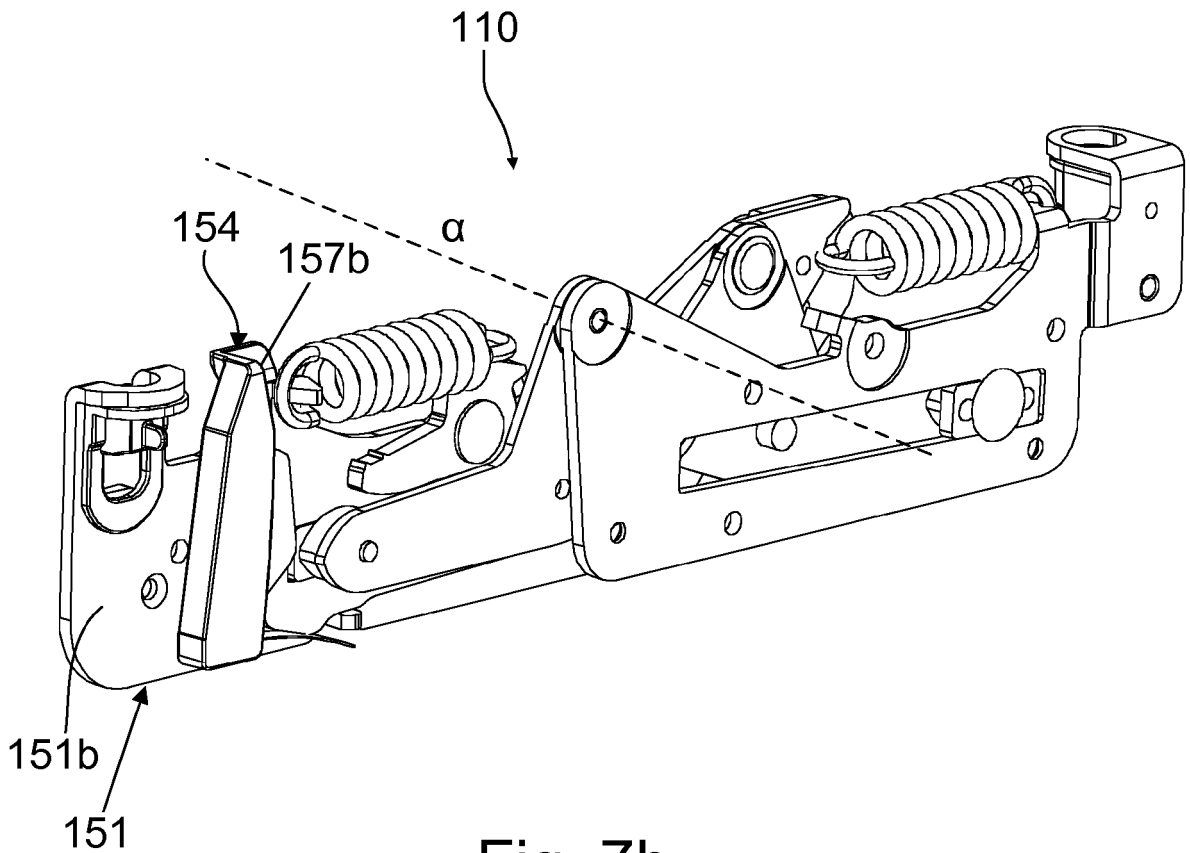
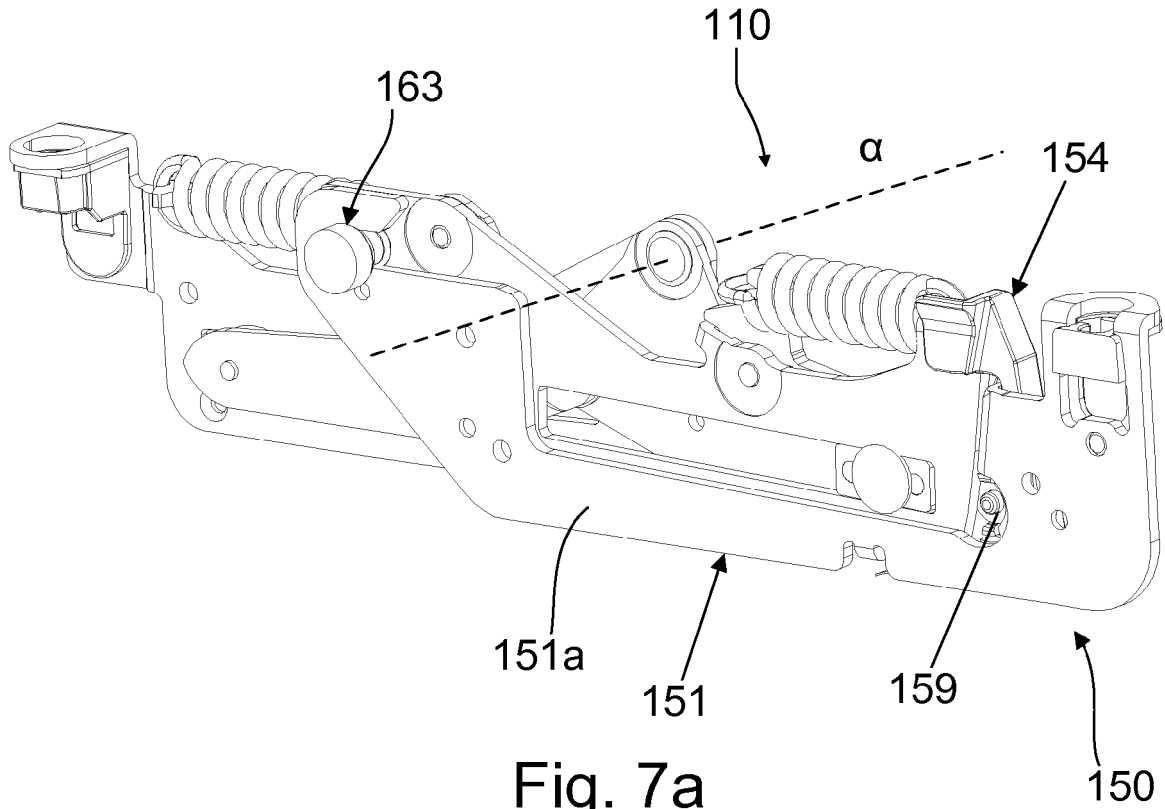


Fig. 6b





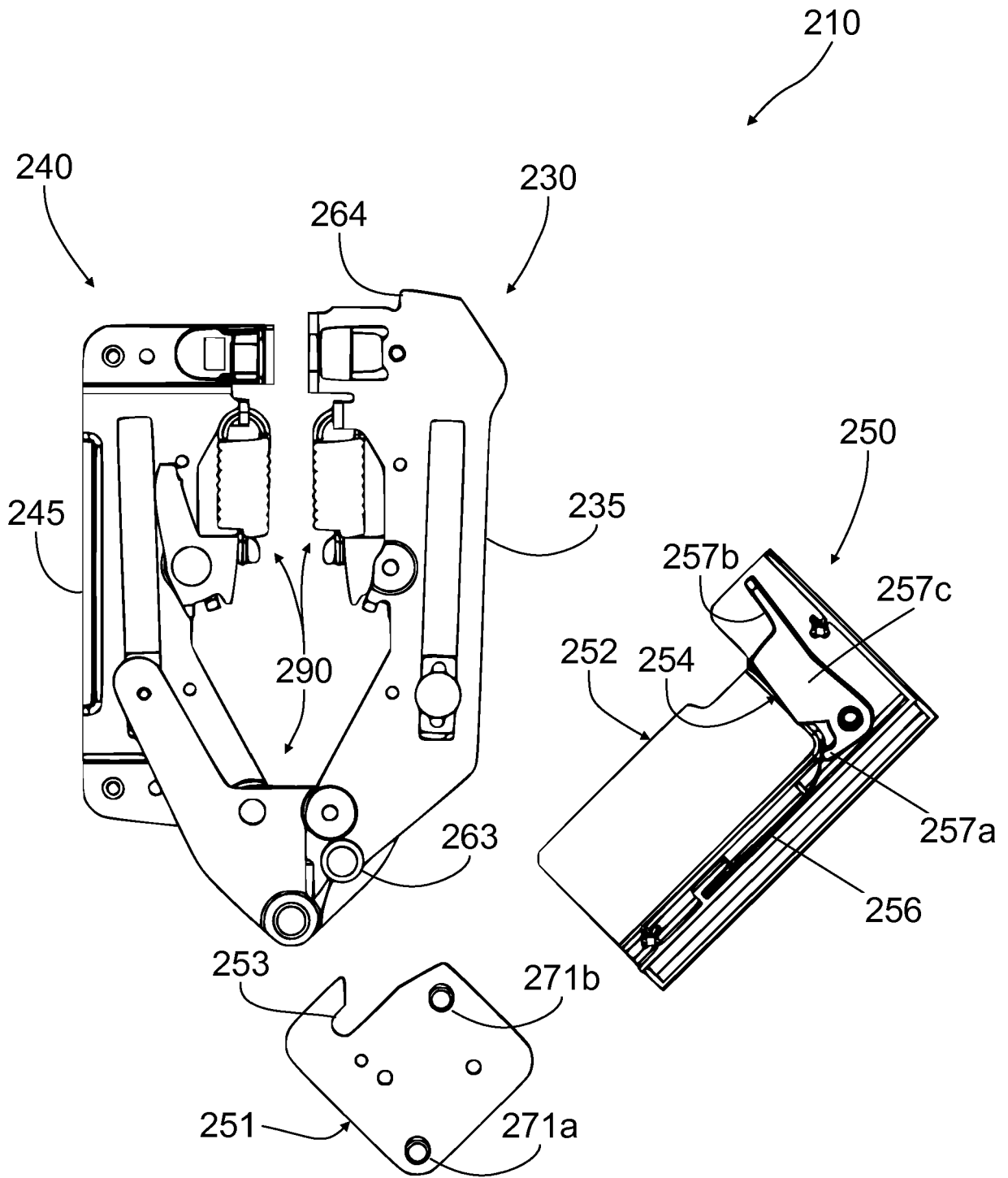


Fig. 8

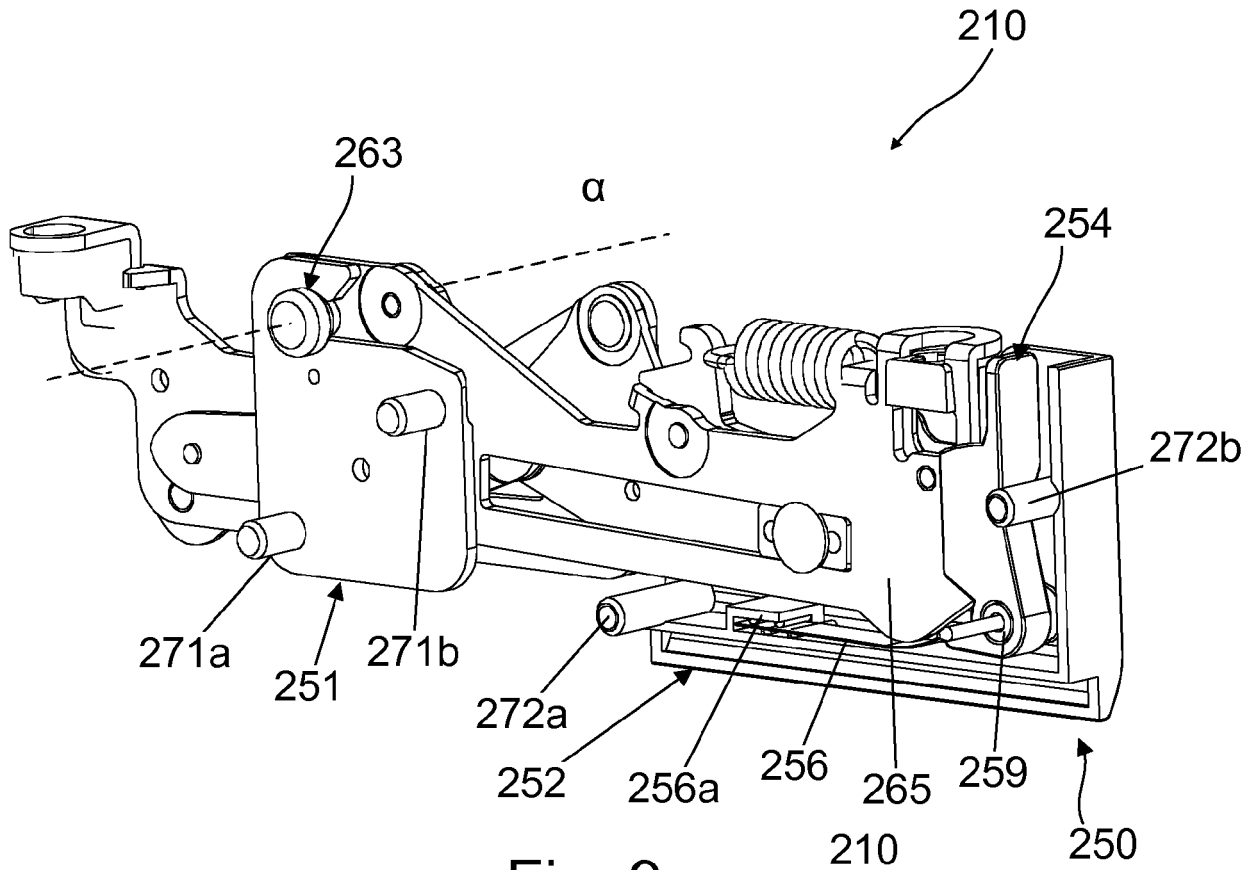


Fig. 9a

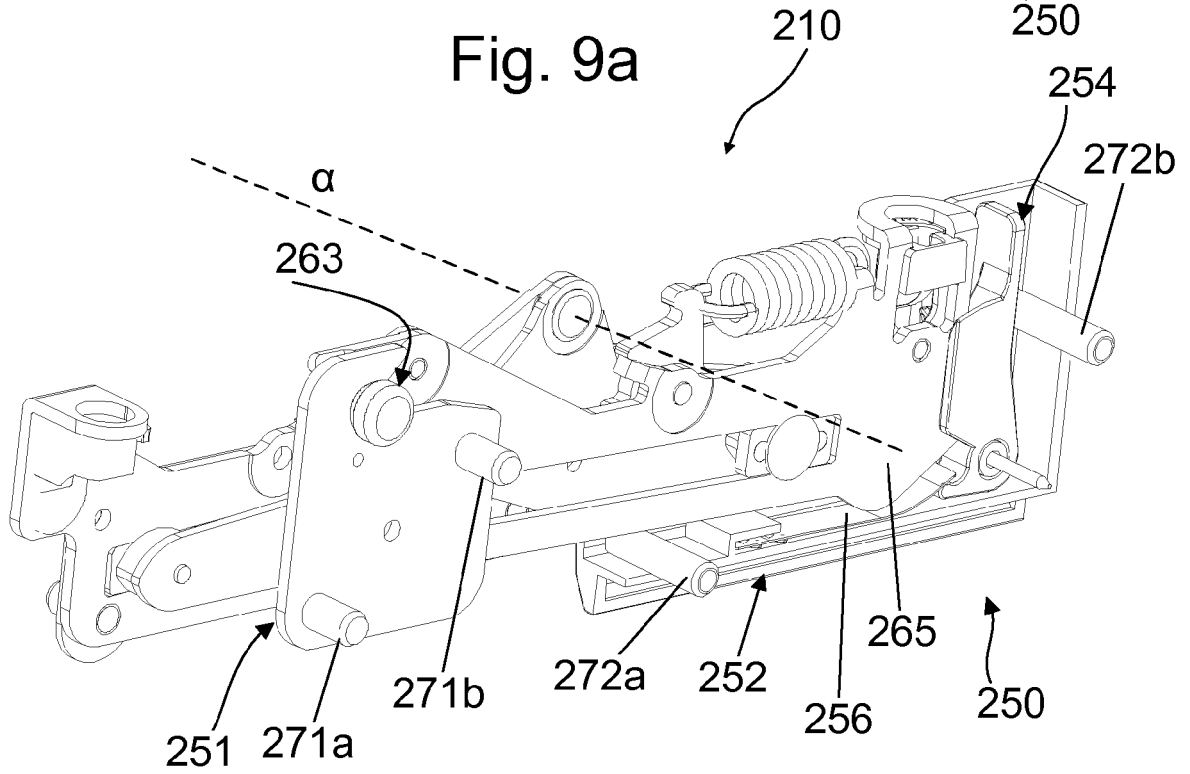


Fig. 9b

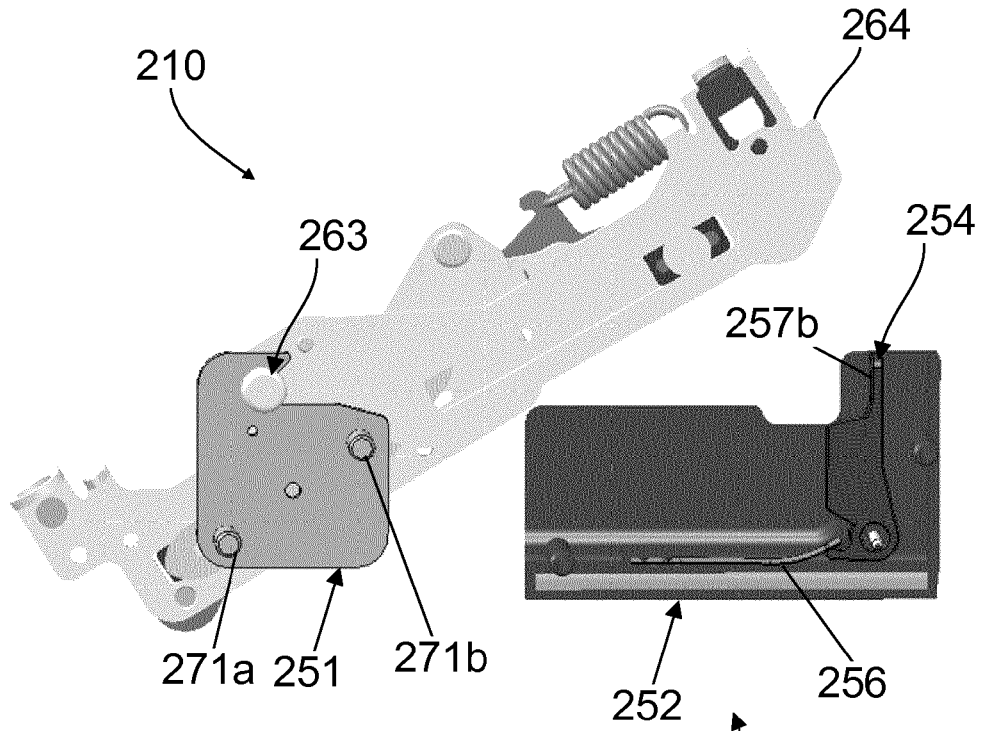


Fig. 10a

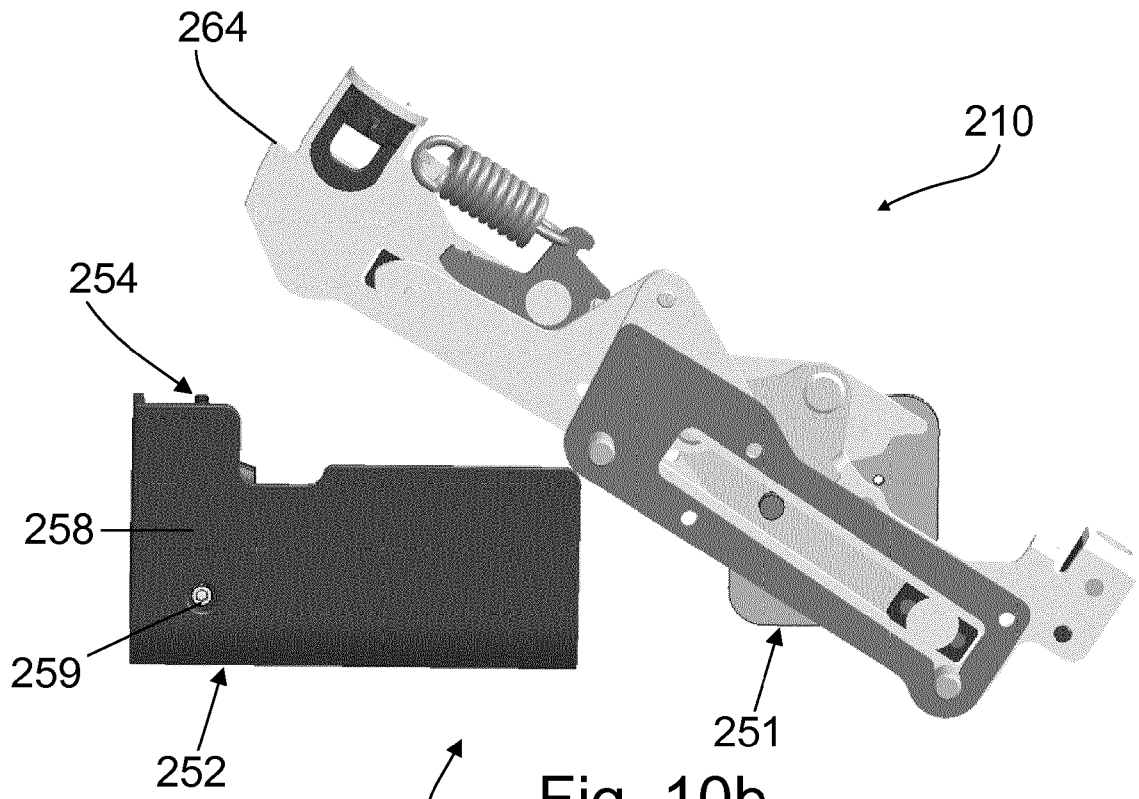


Fig. 10b

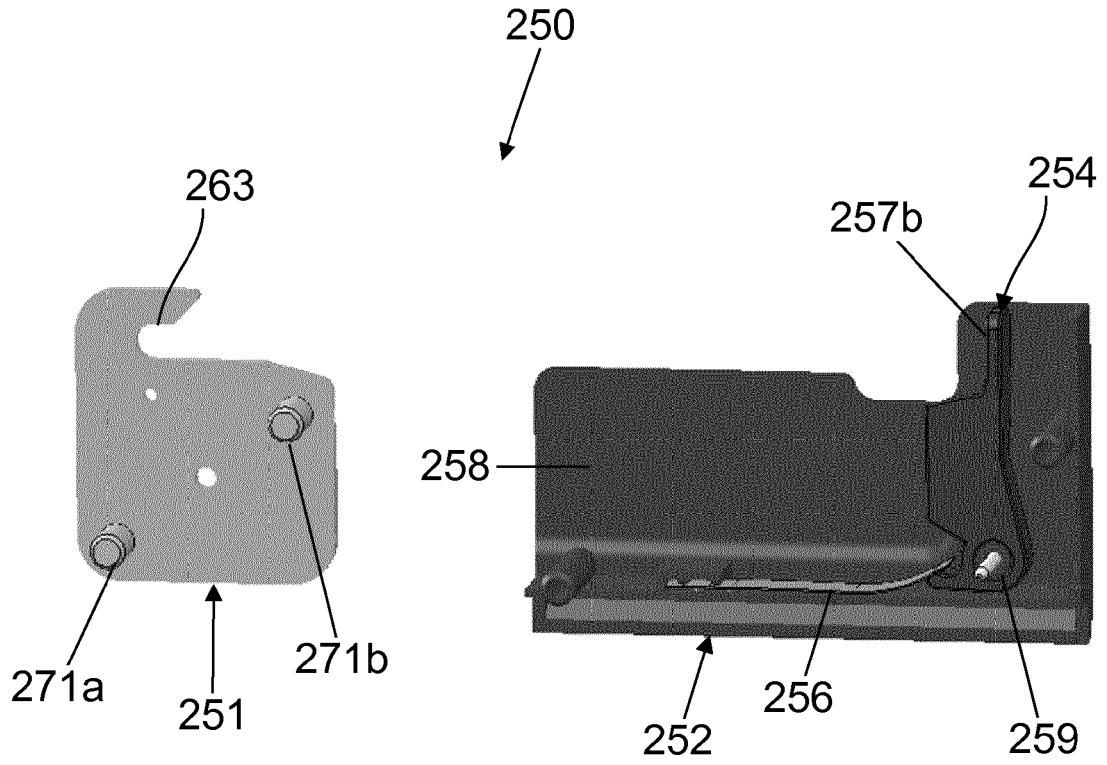


Fig. 11a

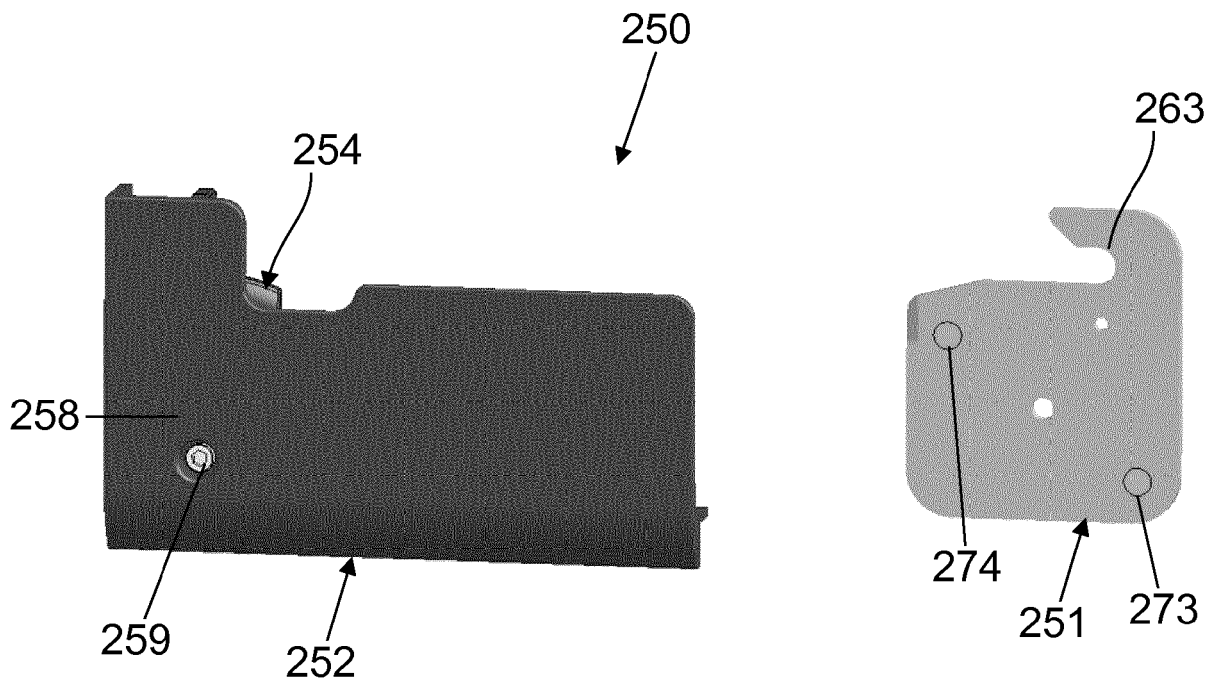


Fig. 11b

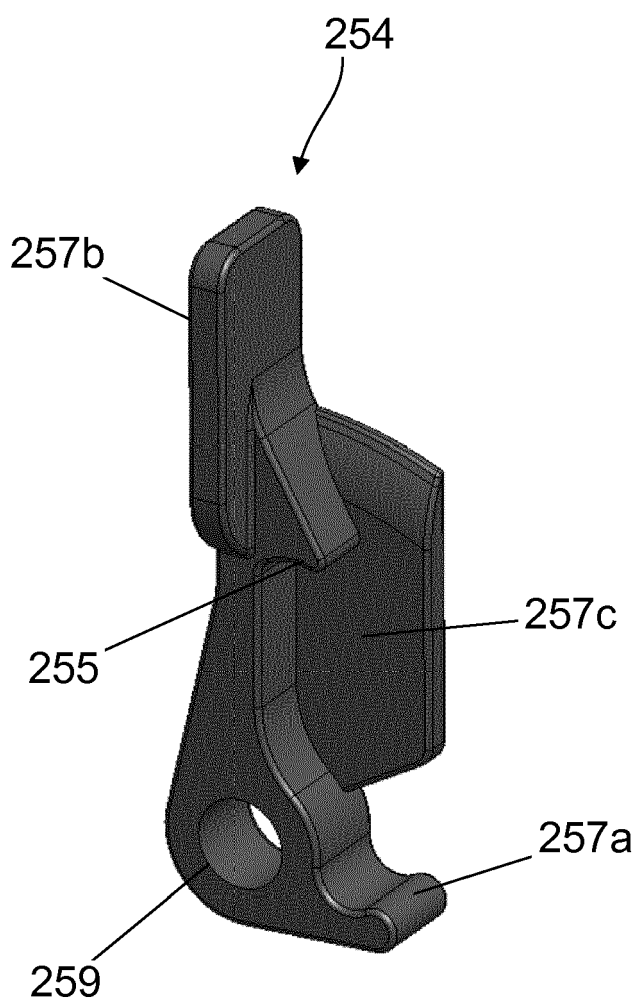


Fig. 12a

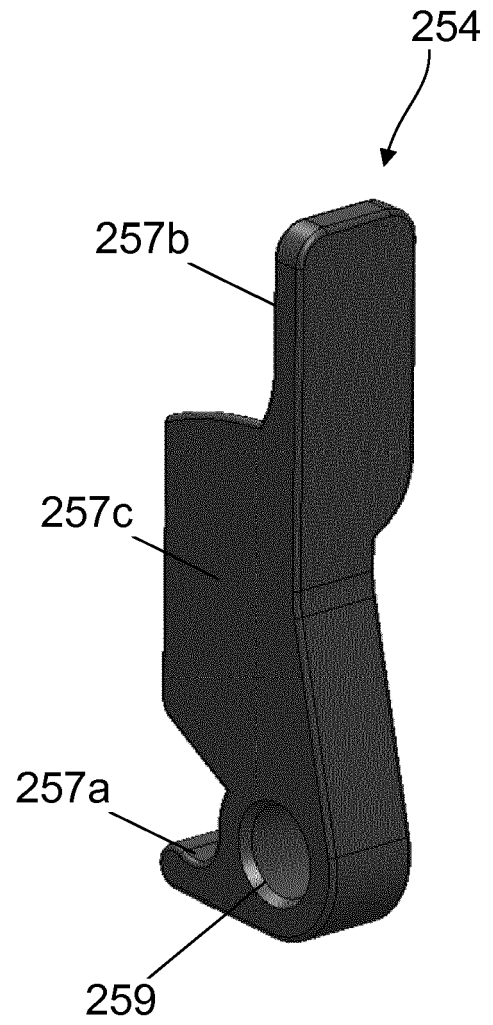


Fig. 12b

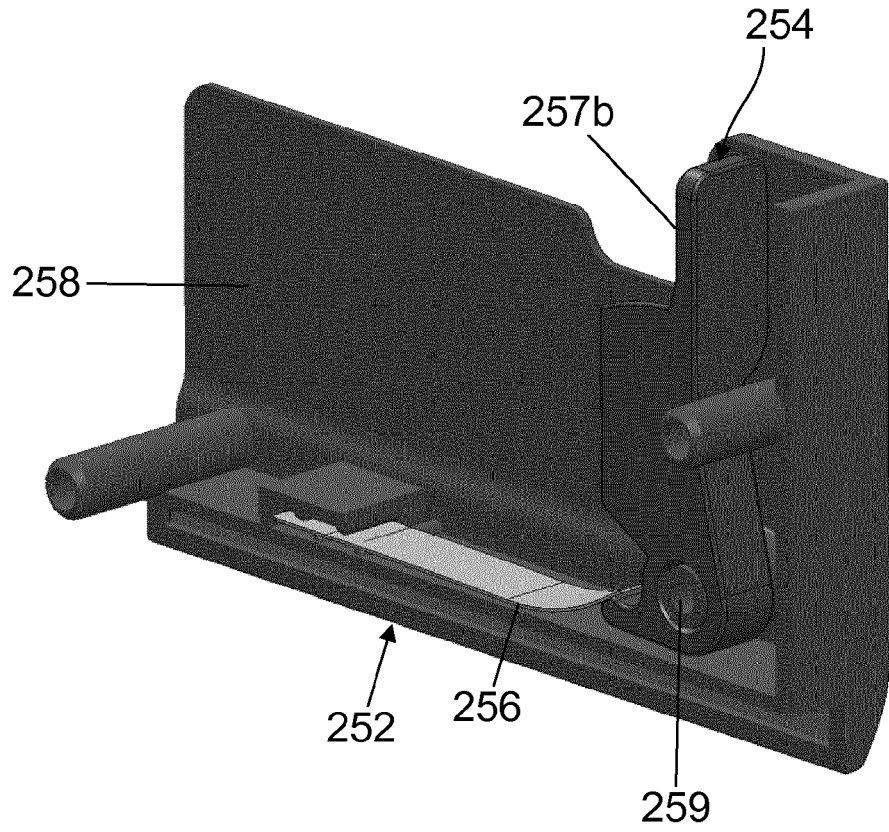


Fig. 13a

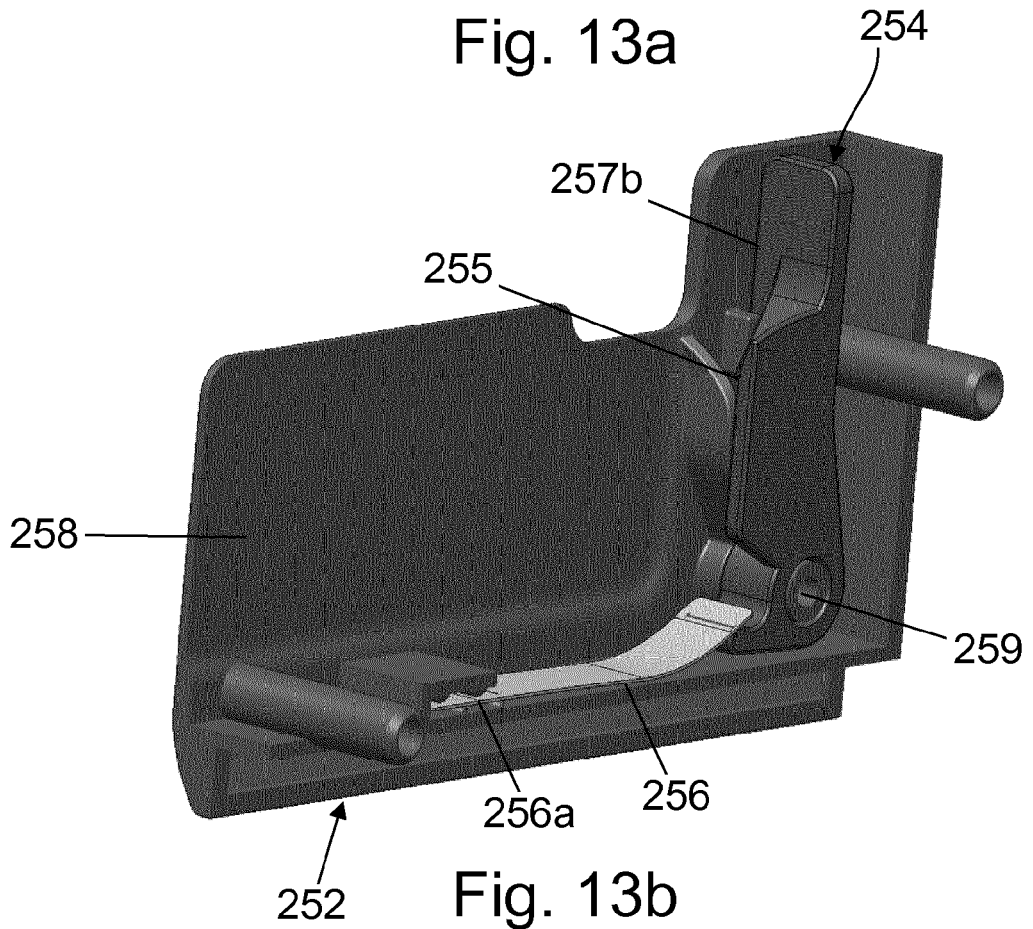


Fig. 13b

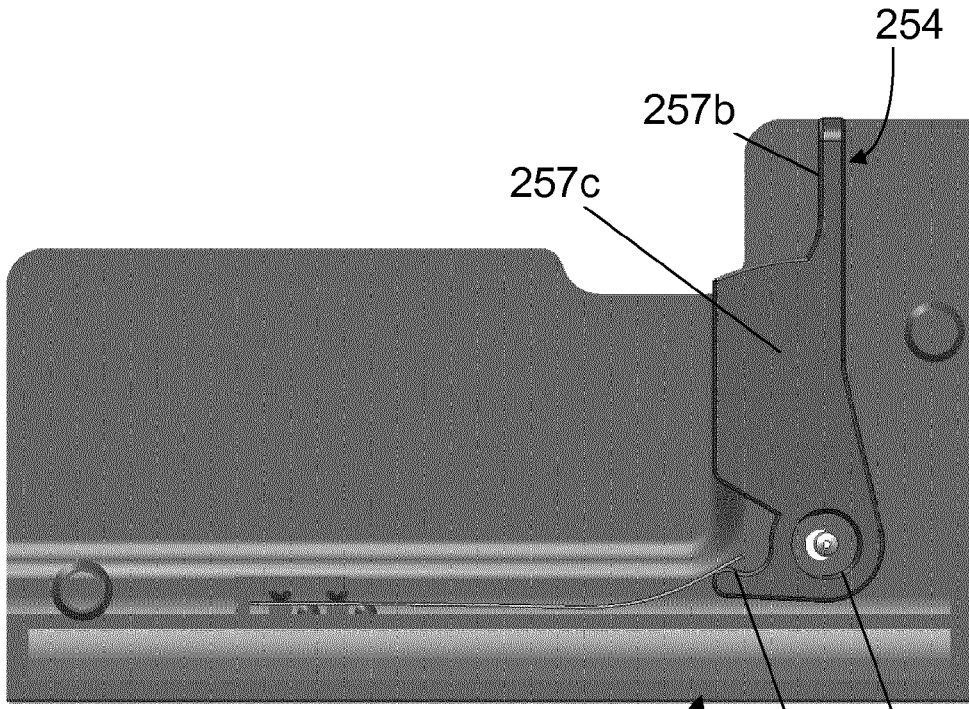


Fig. 14a

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257a 259

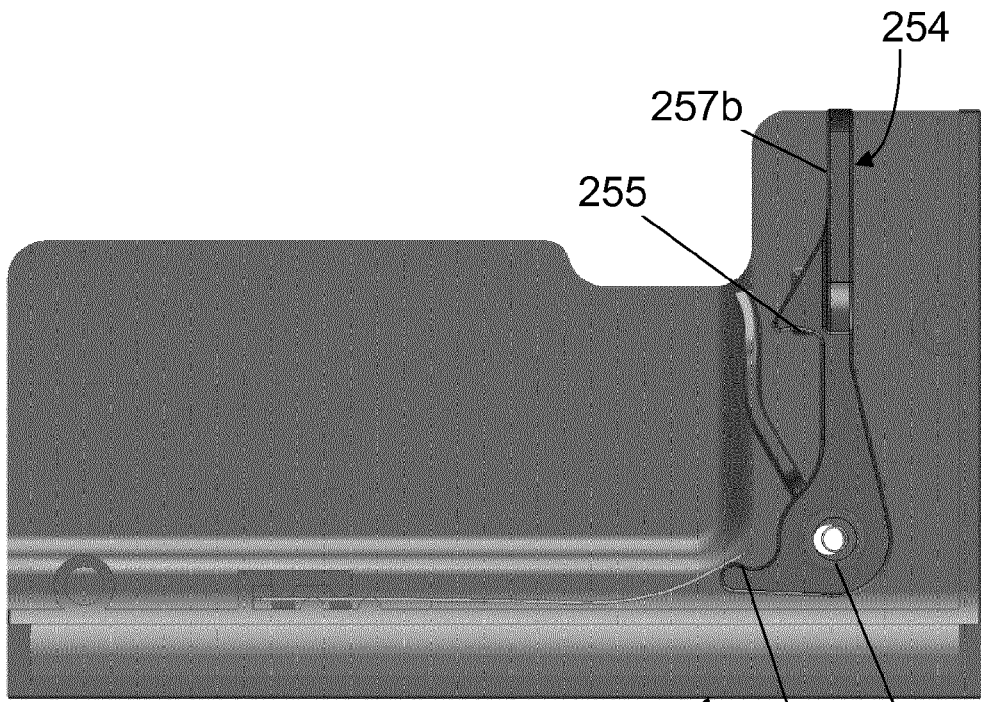


Fig. 14b

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257a 259



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Application Number  
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Place of search The Hague		Date of completion of the search 6 October 2017	Examiner Guillaume, Geert
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