



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.07.2022 Bulletin 2022/28

(51) International Patent Classification (IPC):
E05B 9/00 (2006.01) **E05B 63/06** (2006.01)
E05C 9/00 (2006.01) **E05C 9/20** (2006.01)

(21) Application number: **21213241.9**

(52) Cooperative Patent Classification (CPC):
E05B 63/06; E05B 9/00; E05B 63/0056;
E05C 9/004; E05C 9/20

(22) Date of filing: **08.12.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Assa Abloy Limited**
West Midlands WV13 3PW (GB)

(72) Inventor: **HOLLAND, Stuart Malcolm**
Willenhall, WV13 3PW (GB)

(74) Representative: **Abel & Imray LLP**
Westpoint Building
James Street West
Bath BA1 2DA (GB)

(30) Priority: **21.12.2020 GB 202020221**

(54) **MULTI-POINT LOCK**

(57) The present invention concerns a multipoint lock assembly. More particularly, but not exclusively, this invention concerns a multipoint lock assembly for a window. The multipoint lock assembly comprises a gearbox and a backset facia removably connected to the gearbox. The backset facia is configured such that when remov-

ably connected to the gearbox in a first orientation, a first backset is provided, and when removably connected to the gearbox in a second orientation, a second, different, backset is provided. This allows the lock assembly to be easily adjusted to provide a first backset or a second backset using the same components.

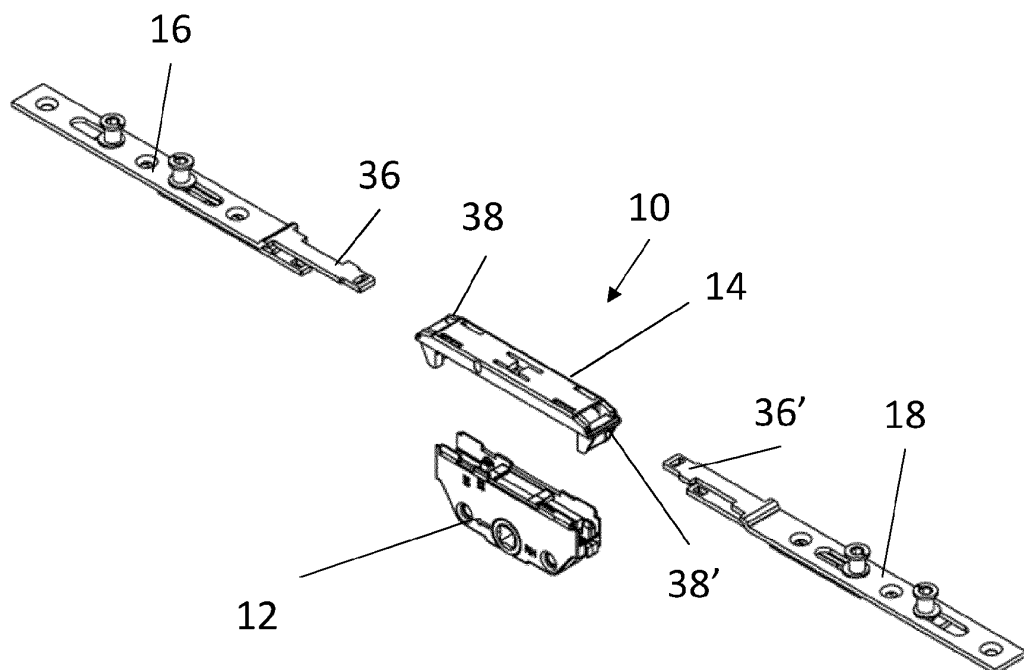


Fig. 2

Description

Field of the Invention

[0001] The present invention concerns a multipoint lock assembly. More particularly, but not exclusively, this invention concerns a multipoint lock assembly for a window.

Background of the Invention

[0002] Windows are often provided with a multipoint espagnolette lock assembly. An espagnolette lock assembly is provided on an edge of the window, and includes a face plate, a gearbox connected to one or more rod assemblies, and multiple mushroom roller locking members connected to the rod assemblies that are moved into and out of engagement with corresponding keeps in the window frame. The gearbox converts the rotary motion of a handle into linear motion which drives the rod assemblies to move the mushroom roller locking members. The distance between the centre point of the handle connected to the gearbox and the external face of the gearbox is known as the backset of the lock, and different windows have different backset requirements. For example, common backset distances are 20mm and 22mm. Also, as windows come in many different sizes, the required length of rod assemblies also varies. Typically, this requires many different window lock assemblies to be manufactured, in order that all backset and rod assembly lengths are covered.

[0003] The present invention seeks to mitigate the above-mentioned problems. Alternatively or additionally, the present invention seeks to provide an improved multipoint lock assembly.

Summary of the Invention

[0004] The present invention provides a multipoint lock assembly comprising: a gearbox, and a backset facia removably connected to the gearbox, wherein the backset facia is configured such that when removably connected to the gearbox in a first orientation, a first backset is provided, and when removably connected to the gearbox in a second orientation, a second, different, backset is provided.

[0005] Advantageously, the lock assembly may be easily adjusted to provide a first backset or second backset using the same components. This may reduce the stock levels required to be held by a manufacturer or supplier. The multipoint lock assembly may be a multipoint window lock assembly. The multipoint lock assembly may comprise an espagnolette lock assembly. The multipoint lock assembly may comprise a shoot-bolt lock assembly. The multipoint lock assembly may simplify the fitment of lock assemblies and provide a lock assembly that is compatible with a wider range of windows than existing lock assemblies. The multipoint lock

assembly may allow easy adjustment by an engineer in the field, thus reducing the chances of incompatible lock assemblies causing installation delays.

[0006] The backset facia and gearbox may be provided with formations that abut when the backset facia is removably connected to the gearbox in a first orientation in order to provide the first backset, and wherein said formations do not abut when the backset facia is removably connected to the gearbox in the second orientation in order to provide the second backset. The formations may be castellations that align in the first orientation such that the raised portions of the castellations abut one another when the backset facia is removably connected to the gearbox in a first orientation, and that are offset in the second orientation such that the raised portions do not abut one another when the backset facia is removably connected to the gearbox in the second orientation.

[0007] The backset facia may be rotated between the first and second orientations.

[0008] The backset facia and gearbox may each comprise one or more formations that engage so as to provide the removable coupling between the backset facia and the gear box. The one or more formations of the backset facia or the gearbox may be resiliently deformable. The backset facia may be moulded out of a plastics material. The backset facia may be moulded or machined out of a metal material. During the coupling of the backset facia and the gearbox, the one or more formations may deform and then return to shape once engaged with a corresponding formation. This may allow the backset facia and gearbox to be clipped together. By providing resiliently deformable formations, the backset facia may be disconnected from the gearbox without damage to either the backset facia or the gearbox. Such an arrangement may allow the backset facia to be removably connected to the gearbox in the first orientation, disconnected from the gearbox, and then removably connected to the gearbox in the second orientation, or vice versa. Alternatively or additionally, the gearbox may comprise resiliently deformable formations which facilitate the removable connection between the backset facia and the gearbox. The one or more formations are arranged to engage in a first configuration when the backset facia and gearbox are removably connected in the first orientation, and arranged to engage in a second configuration when the backset facia and gearbox are removably connected in the second orientation. Provision of formations on the backset facia and/or gearbox which allow the removable connection of the backset facia and gearbox may reduce the number of parts required in the multipoint lock assembly, and also simplify the assembly process. Alternatively or additionally, there may be fasteners such as clips, screws, and/or pins which connect the backset facia to the gearbox.

[0009] The backset facia may further comprise a first connection aperture and second connection aperture, the first connection aperture configured to allow the insertion and connection of a first faceplate and rod as-

sembly, the second connection aperture configured to allow the insertion and connection of a second faceplate and rod assembly. Each faceplate and rod assembly may be inserted through the respective connection aperture and connected to the backset facia by engagement of one or more cooperating formations on the faceplate and rod assembly and backset facia. For example, each faceplate may comprise an aperture which engages with a corresponding clip when the faceplate is inserted through the connection aperture. Advantageously, the arrangement allows for the easy engagement of faceplate and rod assemblies to the backset facia. The arrangement also allows for the engagement of different length faceplate and rod assemblies with the backset facia. In such a way, multipoint lock assemblies of different length can easily be provided without required large levels of stock to be maintained. The arrangement may also allow offset multipoint lock assemblies to be provided, where the first faceplate and rod assembly is a different length to the second faceplate and rod assembly.

[0010] According to a second aspect of the invention, the invention provides a method of manufacturing a multipoint lock assembly according to the first aspect of the invention with a first backset or a second backset, the method comprising the steps of: removably connecting a backset facia to a gearbox in a first orientation to provide the first backset, and removably connecting a backset facia to a gearbox in a second orientation to provide the second backset.

[0011] According to a third aspect of the invention, there is provided a multipoint lock assembly comprising: a gearbox, and a backset facia removably connected to the gearbox, the backset facia comprising a first connection aperture and a second connection aperture, the first connection aperture configured to allow the insertion and connection of a first faceplate and rod assembly, the second connection aperture configured to allow the insertion and connection of a second faceplate and rod assembly.

[0012] Each faceplate and rod assembly may be inserted through the respective connection aperture and connected to the backset facia by engagement of one or more cooperating formations on the faceplate and rod assembly and backset facia. Advantageously, the arrangement allows for the easy engagement of faceplate and rod assemblies to the backset facia. The arrangement also allows for the engagement of different length faceplate and rod assemblies with the backset facia. In such a way, multipoint lock assemblies of different length can easily be provided without required large levels of stock to be maintained. The arrangement may also allow offset multipoint lock assemblies to be provided, where the first faceplate and rod assembly is a different length to the second faceplate and rod assembly.

[0013] According to a fourth aspect of the invention, there is provided a method of manufacturing a multipoint lock assembly according to the third aspect of the invention, the method comprising the steps of: inserting a first faceplate and rod assembly through the first connection

aperture of the backset facia, such that the first faceplate and rod assembly connect to the backset facia, and inserting a second faceplate and rod assembly through the second connection aperture of the backset facia, such that the first faceplate and rod assembly connect to the backset facia, and removably connecting the backset facia to a gearbox.

[0014] It will of course be appreciated that features described in relation to one aspect of the present invention may be incorporated into other aspects of the present invention. For example, the methods of the invention may incorporate any of the features described with reference to the apparatuses of the invention and *vice versa*. Additionally, any of the features described with respect to the first aspect of the invention and third aspect of the invention may be combined, as can any of the features described with reference to the second aspect of the invention and fourth aspect of the invention.

20 Description of the Drawings

[0015] Embodiments of the present invention will now be described by way of example only with reference to the accompanying schematic drawings of which:

Figure 1 shows a schematic view of a multipoint lock assembly according to a first embodiment of the invention;

Figure 2 shows an exploded view of the multipoint lock assembly shown in figure 1;

Figure 3 shows a plan view of the multipoint lock assembly shown in figure 1;

Figure 4 shows a side view of the multipoint lock assembly shown in figure 1;

Figure 5 shows an exploded view of part of the multipoint lock assembly shown in figure 1;

Figure 6 shows a side view of a gearbox which forms part of the multipoint lock assembly shown in figure 1;

Figure 7 shows the opposite side view of the gearbox shown in figure 6;

Figure 8 shows a side view and series of cross-sectional views of a multipoint lock assembly in a first configuration; and

Figure 9 shows a side view and series of cross-sectional views of a multipoint lock assembly in a second configuration.

Detailed Description

[0016] Figure 1 shows a schematic view of a multipoint lock assembly 10 according to an embodiment of the invention. The multipoint lock assembly 10 is an espagnolette lock assembly for a window. Figure 2 shows the same multipoint lock assembly 10 in an exploded view. The multipoint lock assembly 10 comprises a gearbox 12, a backset facia 14, a first faceplate and rod assembly 16 and a second faceplate and rod assembly 18. The backset facia 14 is removably connected to the gearbox

12 by a series of clips as will be described later. The backset facia 14 also receives the first faceplate and rod assembly 16 and second faceplate and rod assembly 18, in such a way that the rod assemblies are connected to the gearbox 12 as will also be described below.

[0017] Figure 3 is a plan view of the multipoint lock assembly 10 and figure 4 is a side view of the multipoint lock assembly 10. As can be seen, the first faceplate and rod assembly 16 comprises a faceplate 20, a first rod 22, and a second rod 24, the faceplate 20, first rod 22, and second rod 24 running alongside each other and away from the gearbox 12. The faceplate 20 comprises a first slot 26 and a second slot 28. The first rod 22 comprises a first mushroom roller 30 and the second rod comprises a second mushroom roller 32. The first mushroom roller 30 extends through the first slot 26 and the second mushroom roller 32 extends through the second slot 28. The gearbox 12 comprises a first tab to which the first rod 22 is connected and a second tab to which the second rod 24 is connected. As is conventional in such gearboxes, the gearbox 12 comprises a handle aperture 34, into which a handle may be inserted. Rotational movement of the handle aperture 34 is imparted by a user rotating the handle, which is turned into linear motion of the first tab and second tab. In this case, the linear motion of the first tab is in the opposite direction to but parallel with the linear motion of the second tab. As can be seen in figure 3, the first mushroom roller is located at one end of the first slot 26, and the second mushroom roller is located at the opposite end of the second slot 28. When the gearbox 12 is activated by a user rotating a handle in the handle aperture, the first tab moves the first rod 22 and the second tab moves the second rod 24, such that the first mushroom roller 30 and second mushroom roller 32 move in opposite directions, and to the opposite sides of the first slot 26 and second slot 28. As will be understood by the person skilled in the art, the multipoint lock assembly 10 is arranged to be installed on the edge of a window, and the first mushroom roller 30 and second mushroom roller 32 are arranged to engage with corresponding keeps in the window frame in a locked position such that the window may not be moved away from the frame, and disengage from the corresponding formations in the window frame in an unlocked position, such that the window may be moved away from the frame. Figure 3 shows the positions of the first mushroom roller 30 and second mushroom roller 32 in the locked position. In the unlocked position the mushroom rollers will have been moved to opposite sides of the respective slots.

[0018] The second faceplate and rod assembly 18 is configured in the same way as the first faceplate and rod assembly 16, with like elements given the same reference number with the addition of the suffix (''). The second faceplate and rod assembly 18 comprises a second faceplate 20', with a third slot 28' and fourth slot 26'. A third rod 22' has a third mushroom roller 30', and fourth rod 24' has a fourth mushroom roller 32'. The third rod 22' is connected to a third tab in the gearbox 12, and the fourth

rod 24' is connected to a fourth tab in the gearbox 12. The first tab and fourth tab are connected and driven together, and the second tab and third tab are connected and driven together. This results in the simultaneous linear movement of the first mushroom roller 30 and fourth mushroom roller 32' in the same direction, and the simultaneous linear movement of the second mushroom roller 32 and third mushroom roller 30' in the same direction, when the handle aperture 34 is rotated.

[0019] As can be seen best in figure 2, the first faceplate 20 and second faceplate 20' include engagement arms 36, 36' respectively. The engagement arms 36, 36' are inserted through respective connection apertures 38, 38' in the backset facia 14. The engagement arms 36, 36' include apertures that match with corresponding clips in the backset facia 14, such that when the apertures and clips are connected together, movement of the engagement arms 36, 36', away from the backset facia 14 is obstructed.

[0020] Figure 5 shows an exploded view of the backset facia 14 and the gearbox 12. The backset facia 14 is arranged to be removably connected to the gearbox 12 in a first orientation which provides a first backset, and also in a second orientation which provides a second, different, backset. In this case, the first backset is 20mm and the second backset is 22mm. To facilitate the removable connection between the gearbox 12 and the backset facia 14, the backset facia 14 comprises two end clips 40 and 42, which fit over and engage with respective end formations 44 and 46 formed on the gearbox 12. The end clips 40 and 42 are formed such that they can fit over and engage with either of the end formations 44 and 46, allowing the removable connection of the backset facia 14 and gearbox 12 in a first orientation or second orientation. In the first orientation, the clip 40 fits over and engages with the formation 44, and the clip 42 fits over and engages with the clip 46. In the second orientation, the clip 40 fits over and engages with the clip 46, and the clip 42 fits over and engages with the clip 44. The gearbox 12 comprises a series of castellated edges 48. The backset facia comprises a series of formations 50 which in the first orientation receive the castellated edges 48, such that the backset facia 14 is located in close proximity to the gearbox 12 and a first backset of 20mm is provided. The series of formations 50 is further formed such that when the backset facia 14 and gearbox 12 are removably connected in the second orientation, the formations about the castellated edges 48, such that the backset facia is held further away from the gearbox 12 and a second backset of 22mm is provided.

[0021] The backset facia includes a backset indicator 52 which aligns with numbers indicating the backset present on the gearbox. In the first orientation the backset indicator 52 is aligned with the backset number 20, and in the second orientation the backset indicator 52 is aligned with the backset number 22. Thereby it is both easy to connect the backset facia 14 and gearbox 12 in such a way as to provide the required backset, and also

easy for a user to know the backset of the multipoint lock assembly when assembled.

[0022] Figure 8 shows the multipoint lock assembly 10 with the backset facia in the first orientation, giving a backset of 20mm. Various cross-sectional views are shown indicating the profile of the castellations 48 of the gear box 12 and formations 50 on the inside of the backset facia 14 at various points, which allows the close spacing between the backset facia 14 and gearbox 12.

[0023] Figure 9 shows the multipoint lock assembly 10 with the backset facia in the second orientation, giving a backset of 22mm. Various cross-sectional views are shown indicating the profile of the castellations 48 of the gear box 12 and formations 50 on the inside of the backset facia 14 at various points, where the castellations 48 about the formations 50 such that greater space is provided between the backset facia 14 and gearbox 12, with a correspondingly larger backset.

[0024] The method of assembling the multipoint lock assembly is as follows. The engagement arm 36 of first faceplate and connecting rod assembly 16 is inserted through the connection aperture 38 in the backset facia 14, and the engagement arm 36' of the second faceplate and connecting rod assembly is inserted through the connection aperture 38', such that the apertures in the engagement arms 36, 36', are engaged with the respective clips in the backset facia 14. The backset facia 14 and first faceplate and connecting rod assembly 16 and second faceplate and connecting rod assembly 18 are then aligned with the gearbox 12 such that the rod assemblies 22, 24, 22' and 24', match up with the first, second, third, and fourth tabs in the gearbox 12. The alignment of the backset facia 14 and gearbox 12 is either with the backset facia 14 in the first orientation if the first backset spacing is desired, or the second orientation if the second backset spacing is desired. The backset facia 14 is then clipped into engagement with the gearbox 12 in order to form the multipoint lock assembly 10.

[0025] Whilst the present invention has been described and illustrated with reference to particular embodiments, it will be appreciated by those of ordinary skill in the art that the invention lends itself to many different variations not specifically illustrated herein. By way of example only, certain possible variations will now be described.

[0026] The embodiment described with reference to figure 1 has faceplate and rod assemblies of the same length. The skilled person will appreciate that different length faceplate and rod assemblies may be provided, in order to create a multipoint lock assembly of a different length. Alternatively or additionally, the first faceplate and rod assembly may have a different length to the second faceplate and rod assembly, where an offset multipoint lock assembly is required. The backset facia has two configurations, which correspond to a 20mm and 22mm backset in the embodiment described with reference to figure 1. Alternative backset measurements may be provided, for example a 22mm and 25mm backset, or any

other convenient combinations.

[0027] The multipoint lock assembly may be a shoot-bolt lock assembly. The multipoint lock assembly may be for a door.

[0028] Where in the foregoing description, integers or elements are mentioned which have known, obvious or foreseeable equivalents, then such equivalents are herein incorporated as if individually set forth. Reference should be made to the claims for determining the true scope of the present invention, which should be construed so as to encompass any such equivalents. It will also be appreciated by the reader that integers or features of the invention that are described as preferable, advantageous, convenient or the like are optional and do not limit the scope of the independent claims. Moreover, it is to be understood that such optional integers or features, whilst of possible benefit in some embodiments of the invention, may not be desirable, and may therefore be absent, in other embodiments.

Claims

1. A multipoint lock assembly comprising:

a gearbox, and
a backset facia removably connected to the gearbox, wherein the backset facia is configured such that when removably connected to the gearbox in a first orientation, a first backset is provided, and when removably connected to the gearbox in a second orientation, a second, different, backset is provided.

2. A multipoint lock assembly as claimed in claim 1, wherein the backset facia and gearbox are provided with formations that abut when the backset facia is removably connected to the gearbox in a first orientation in order to provide the first backset, and wherein said formations do not abut when the backset facia is removably connected to the gearbox in the second orientation in order to provide the second backset.

3. A multipoint lock assembly as claimed in claim 2, wherein the formations are castellations that align in the first orientation such that the raised portions of the castellations abut one another when the backset facia is removably connected to the gearbox in a first orientation, and that are offset in the second orientation such that the raised portions do not abut one another when the backset facia is removably connected to the gearbox in the second orientation.

4. A multipoint lock assembly as claimed in any preceding claim, wherein the backset facia is rotated between the first and second orientations.

5. A multipoint lock assembly as claimed in any pre-

ceding claim, wherein the backset facia and gearbox each comprise one or more formations that engage so as to provide the removable connection between the backset facia and the gear box.

6. A multipoint lock assembly as claimed in claim 5, wherein the one or more formations are arranged to engage in a first configuration when the backset facia and gearbox are removably connected in the first orientation, and arranged to engage in a second configuration when the backset facia and gearbox are removably connected in the second orientation.
7. A multipoint lock assembly as claimed in any preceding claim, wherein the backset facia further comprises a first connection aperture and second connection aperture, the first connection aperture configured to allow the insertion and connection of a first faceplate and rod assembly, the second connection aperture configured to allow the insertion and connection of a second faceplate and rod assembly.
8. A method of manufacturing a multipoint lock assembly according to claim 1 with a first backset or a second backset, the method comprising the steps of: removably connecting a backset facia to a gearbox in a first orientation to provide the first backset, and removably connecting a backset facia to a gearbox in a second orientation to provide the second backset.
9. A multipoint lock assembly comprising
a gearbox, and
a backset facia removably connected to the gearbox, the backset facia comprising a first connection aperture and a second connection aperture, the first connection aperture configured to allow the insertion and connection of a first faceplate and rod assembly, the second connection aperture configured to allow the insertion and connection of a second faceplate and rod assembly.
10. A multipoint lock assembly as claimed in claim 9, wherein each faceplate and rod assembly is inserted through the respective connection aperture and connected to the backset facia by engagement of one or more cooperating formations on the faceplate and rod assembly and backset facia.
11. A multipoint lock assembly as claimed in claim 9 or claim 10, wherein the first faceplate and rod assembly is a different length to the second faceplate and rod assembly.
12. A method of manufacturing a multipoint lock assembly according to claim 9, the method comprising the

steps of: inserting a first faceplate and rod assembly through the first connection aperture of the backset facia, such that the first faceplate and rod assembly connect to the backset facia, and inserting a second faceplate and rod assembly through the second connection aperture of the backset facia, such that the first faceplate and rod assembly connect to the backset facia, and removably connecting the backset facia to a gearbox.

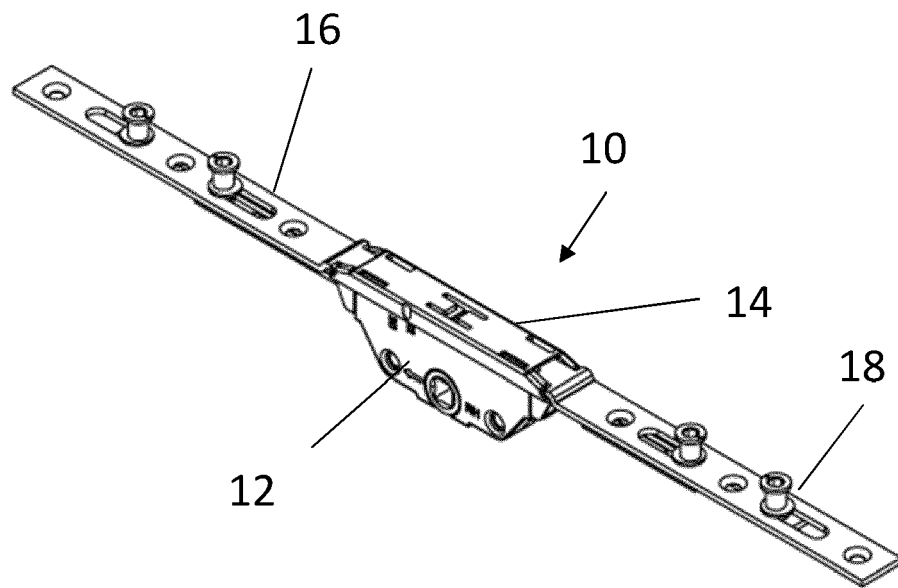


Fig. 1

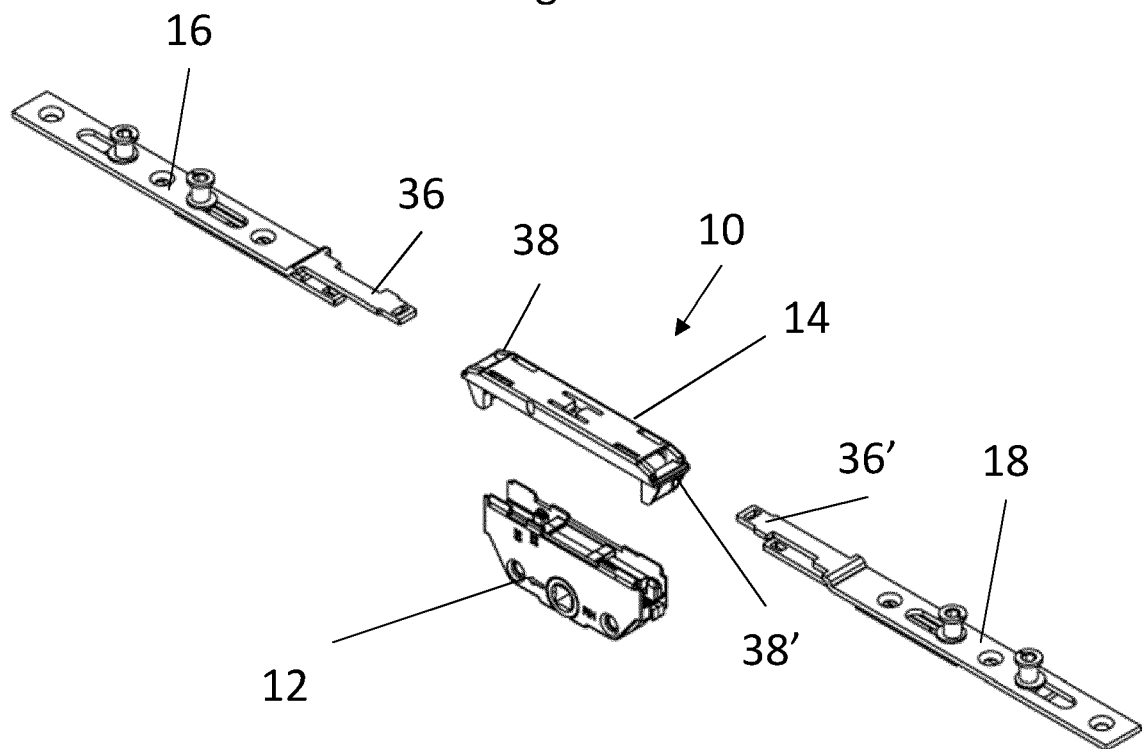
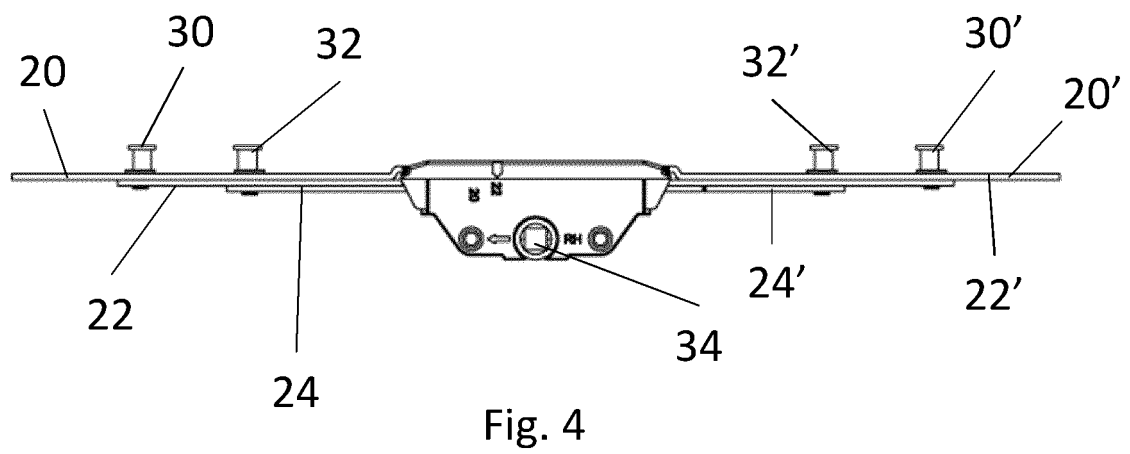
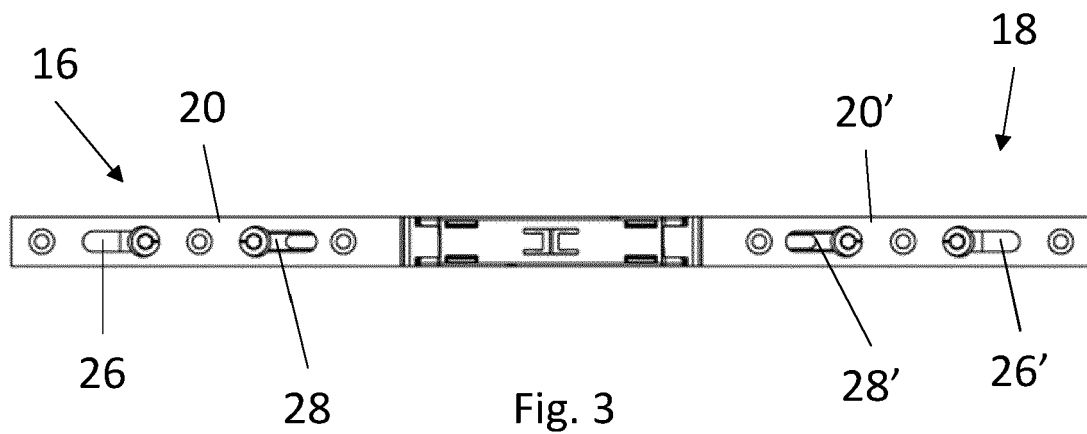


Fig. 2



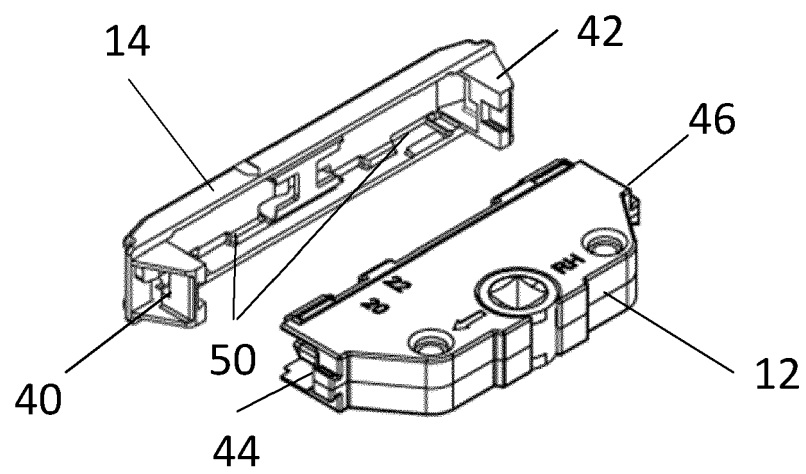


Fig. 5

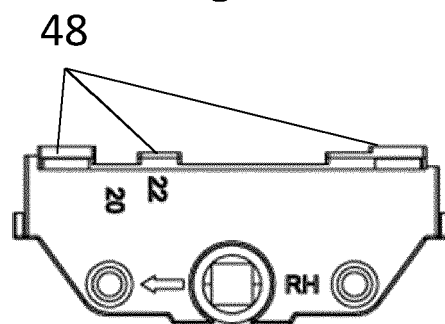


Fig. 6

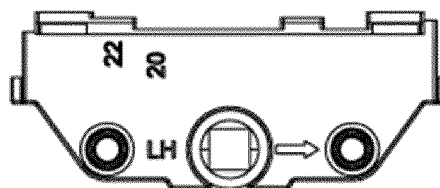


Fig. 7

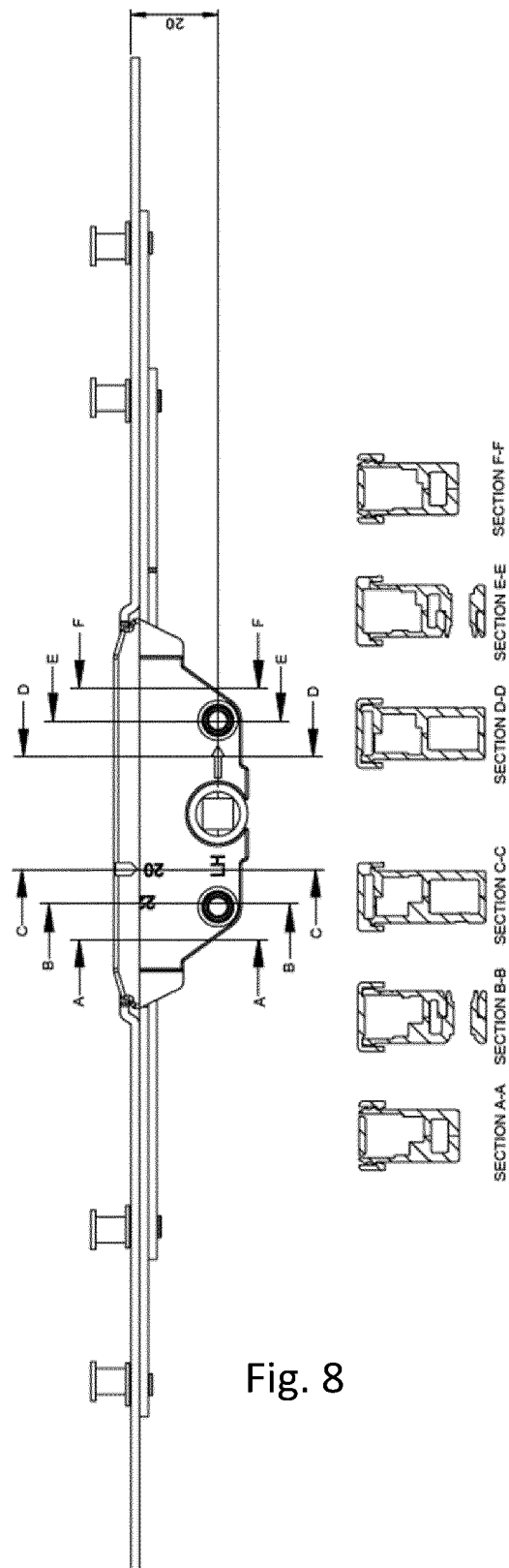


Fig. 8

