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(54) HINGE

(57) The present invention relates to a hinge comprising a sash section 20 securable to a sash, the sash section 20 comprising a cover section 15 and a hinge plate 10; and a frame section 22 securable to a frame, the frame section 22 comprising a hinge pin 7 and a frame part 1, wherein the sash section 20 and the frame section 22 are mounted for relative rotation, wherein the cover section 15 is releasably secured relative to the frame section 22 by means of a first locking element, and wherein the cover section 15 is releasably secured relative to the sash section 20 by means of a second locking element.

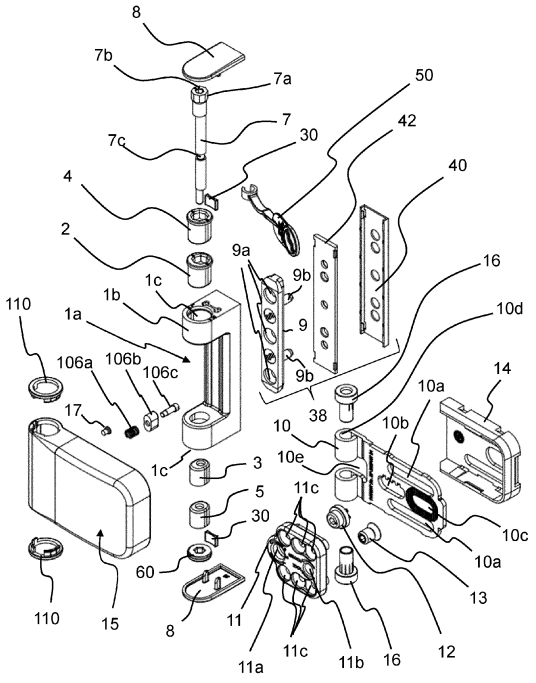

Figure 7

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Description

FIELD

[0001] This invention relates to hinges, particularly, but not exclusively a security-type hinge for a door or window.

BACKGROUND

[0002] Hinges for doors and windows are typically made of two sections, a first section being a sash section for attachment to a sash element (a door or window) and a second section for attachment to a frame of the window/door. The two sections are hinged together, typically by means of a pin which allows for relative rotation of the sash section and the frame section of the hinge.

[0003] Recent developments in doors have resulted in an edge section of a door becoming more complex due to the profiles that are used, for example in UPVC constructed doors/windows. The response to the increasing complexity of the edges of doors/windows has been to move the attachment point of the sash section to the door or window further from the edge thereof. This movement has created challenges in the design of hinges.

[0004] The security of hinges, to prevent unauthorised entry is also an important factor. Preventing a hinge from being removed or damaged to allow entry to be gained through a door or window is also an important issue. Furthermore, the efficiency and speed with which a hinge can be fitted is also relevant to the desirability of a hinge, because the speed of fitting is advantageous, but not if the hinge becomes too insecure.

[0005] It is an object of the present invention to address the above-mentioned disadvantages.

SUMMARY

[0006] According to the present invention, there is provided an apparatus and method as set forth in the appended claims. Other features of the invention will be apparent from the dependent claims, and the description which follows.

[0007] According to a first example of the invention, there is provided a hinge comprising a sash section securable to a sash, the sash section comprising a cover section and a hinge plate; and a frame section securable to a frame, the frame section comprising a hinge pin and a frame part, wherein the sash section and the frame section are mounted for relative rotation, wherein the cover section is releasably secured relative to the frame section by means of a first locking element, and wherein the cover section is releasably secured relative to the sash section by means of a second locking element.

[0008] Multiple locking elements allow parts of the hinge to be fixed and released independently.

[0009] The first locking element is located at the hinge pin, and the second locking element is remote from the hinge pin.

[0010] The first locking element, when in a locked configuration, may prevent the hinge pin from being removed.

[0011] This may advantageously allow the second locking element to be moved to an unlocked configuration, without unlocking the hinge with respect to the hinge pin.

[0012] The first locking element, when in a locked configuration, may prevent movement of the cover section, relative to the sash section, in a direction parallel to the longitudinal axis of the hinge pin.

[0013] The first locking element, when in a locked configuration, may allow movement of the cover section, relative to the sash section in a direction perpendicular to the longitudinal axis of the hinge pin, and about the axis of the hinge pin.

[0014] The first locking element may be a screw.

[0015] The hinge plate may comprise a channel, wherein the first locking element extends through a break in the channel of the hinge plate.

[0016] The cover section may comprise a centre portion. The cover section may comprise two end apertures.

[0017] The first locking element may be received in a threaded bore in the centre portion.

[0018] The centre portion may further comprise a central aperture.

[0019] The centre point of the end apertures and the central aperture may lay substantially along the same line, such that the hinge pin may pass freely through all three apertures.

[0020] The second locking element, when in a locked configuration, may prevent relative movement of the cover section and the hinge plate.

[0021] The hinge plate may comprise a lip.

[0022] The cover section may comprise a recess, corresponding to the lip, formed on an inner surface of the cover section.

[0023] When in a locked configuration, the lip of the hinge plate and the recess of the cover section may be cooperatively engaged, to prevent the hinge plate and the cover section from separating.

[0024] When in an unlocked configuration, the lip of the hinge plate and the recess of the cover section may be disengaged, to allow the hinge plate and the cover section to move relative to each other.

[0025] The second locking element may further comprise a spring, a collar and a pin.

[0026] The pin may comprise a narrower body and a wider head.

[0027] The spring may be located around the body of the pin.

[0028] The collar may be is recessed at one end, forming an inner face, such that the body of the pin may pass through the collar completely, and the head of the pin may pass into the recessed section until the head of the pin is contained completely within the recessed section of the collar, and one side of the head of the pin is abutted against the inner face of the recess of the collar.

[0029] The second locking element may be biased towards the locked configuration.

[0030] The second locking element may be pressed, by a user, to move from the locked configuration to the unlocked configuration.

[0031] The central aperture of the cover section may be substantially elliptical or oval, to allow movement of the cover section relative to the hinge pin. This advantageously may allow movement of the cover section with respect to the hinge pin, when the first locking element is in a locked configuration.

[0032] The hinge may further comprise a datum section. The datum section may be securable to a door frame. The frame section may be configured to be slidably received by the datum section.

[0033] The datum section may comprise a datum holder, a datum sliding section and a frame datum. In use, the datum holder may be in contact with the door frame, the datum sliding section may be slidably received by the datum holder and projections on the frame datum may be received by aligned openings in the datum sliding section and the datum holder.

[0034] The datum section, in particular the datum holder, provides a flat surface for the hinge to be attached to a door frame. Advantageously, the datum section ensures that the frame section of the hinge is fixed to a flat surface, even if the frame of the door is uneven, due to warping or irregularities in the wood. Therefore, a fitter can align the rest of the hinge with the flat surface of the datum section, reducing the complexity of fitting for the fitter.

[0035] According to a second example of the invention, there is provided a method of fitting a hinge comprising the steps of, when the hinge is in a closed position, releasing a cover section from a frame section by operating a first locking element; wherein a second locking element is in a locked configuration.

[0036] All of the features contained herein may be combined with any of the above aspects, in any combination.

[0037] Although a few preferred embodiments of the present invention have been shown and described, it will be appreciated by those skilled in the art that various changes and modifications might be made without departing from the scope of the invention, as defined in the appended claims.

BRIEF DESCRIPTION OF DRAWINGS

[0038] For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example only, to the accompanying diagrammatic drawings in which:

Figure 1 is a schematic perspective view of a hinge according to an embodiment of the present invention;

Figure 2 is a schematic view from above of the hinge;

Figure 3 is a schematic front view of the hinge;

Figure 4 is a schematic view from below of the hinge

Figure 5 is a schematic end view of the hinge;

Figure 5a is a schematic cross-sectional view of the hinge through the line A-A' in Figure 3;

Figure 6 is a schematic rear view of the hinge;

Figure 7 is a schematic exploded view of the hinge;

Figures 8a to 8d show schematic views of a cover section of the hinge;

Figures 9a to 9c show cross-sectional view of the hinge;

Figures 10a to 10d show perspective views from below of the hinge; and

Figure 11 shows a flow diagram of a method of fitting a hinge.

SPECIFIC DESCRIPTION OF EMBODIMENTS

[0039] An apparatus and method of the present disclosure are described below.

[0040] In particular, the present disclosure is concerned with a hinge, and method of fitting the same.

[0041] For a door that incorporates a double rebate, as is often the case with doors of UPVC construction, a larger chamfer/curve between an end face of the door adjacent the frame in which it sits and the front face of the door becomes larger. This requires a sash section of a hinge to extend further from the frame, or further from a pivoting axis of the hinge, to allow for the sash section to be fitted flush to the front face of the door in order to avoid rebate features of the door and inner parts of the door moulding that might interfere unnecessarily with fixings used to secure the hinge to the sash.

[0042] Figure 1 shows a sash section of a hinge secured a frame section 22 of the hinge. The sash section 20 is secured to a front face of the sash (door/window) and the hinge section 22 is secured to the frame.

[0043] Figure 7 shows the individual elements of the sash section 20 and frame section 22 in more detail.

[0044] The sash section 20 comprises a hinge plate 10. The hinge plate 10 is made of mild steel plate and incorporates two fixing slots 10a, an adjustment slot 10b and a locking opening 10c. In addition, a section of the hinge plate 10 is curled back on itself to create a channel 10d to receive a hinge pin 7, described below. The channel 10d incorporates a break 10e part way along to allow a cover section 15 of the sash section 20 to be locked in

position, as described below.

[0045] The adjustment slot 10b incorporates rack elements that cooperate with a lateral adjustment pinion 12 received in the adjustment slot 10b.

[0046] A sash datum 11 is held flush against the hinge plate 10 and receives the lateral adjustment pinion 12 in an opening 11a. The sash datum 11 is laterally adjustable with respect to the hinge plate 10 by means of the lateral adjustment pinion 12 moving with respect to the adjustment slot 10b. The lateral adjustment pinion 12 has a recessed hexagonal head section for a receipt of a hexagonal tool to achieve adjustment of the lateral adjustment pinion 12 and thereby the sash datum 11.

[0047] The sash datum 11 and hinge plate 10 are held in proximity for sliding engagement with each other by means of a plastic inner housing 14, which incorporates openings therein corresponding to the fixing slots 10a, adjustment slot 10b and locking opening 10c of the hinge plate 10.

[0048] The adjustment of the sash datum 11 allows for movement of approximately 5mm in either direction from a central position to allow for lateral adjustment of a sash part to which the sash section 20 is secured.

[0049] The sash datum 11 incorporates a tapped opening 11b for receiving a lock off screw 13 which secures the sash datum 11 with a respect to the hinge plate 10 upon tightening of the lock off screw 13.

[0050] The sash datum 11 also incorporates two rows of three openings 11c extending therethrough to allow receipt of optional temporary fixings (not shown) which are pushed through the sash datum 11, through the fixing slot 10a and driven into the sash (with e.g. a screwdriver engaged in the head of the fixing (not shown) to temporarily secure the sash datum 11 and hinge plate 10 to the sash until self-tapping screws can be inserted in the remaining openings 11c to properly secure the sash datum 11 and hinge plate 10 to the sash The optional temporary fixings (not shown) are not essential though, because the sash and frame are typically clamped together for installation of the hinge. This means that the sash does not need predrilled holes for the sash part, because the sash part and frame part are supplied as one assembly to a fabricator for attachment of the hinge to the sash and frame.

[0051] A cover section 15 is provided to cover the sash datum 11 and the hinge plate 10 to prevent unauthorised removal of the hinge from the door from an exterior side. The cover section 15 is captive on the hinge pin 7. Recesses 15d engage with sash part bushes 16 (see below) to locate the cover in position and to hold the bushes in position. The cover section 15 is rotatable about the hinge pin 7 independently of the hinge plate 10 and sash datum 11 to allow for installation of the hinge to the sash and then to allow for the hinge plate 10 and sash datum 11 to be covered as described above after installation. The cover section 15 is fixed to the sash section 20 by means of a fixing screw 17 which extends through the break 10e in the hinge plate channel 10d in the hinge plate 10 into a threaded bore 15a in a protrusion 15b on the inside of the centre portion 15e of the cover section 15.

[0052] The frame section 22 comprises a frame part 1 having a recess 1a therein which receives the sash section 20. Bosses 1b of the frame part 1 receive the hinge pin 7 and have openings that are coaxial with the channel 10d in the hinge plate 10 to allow for journaling of the frame section 22. The openings 1c that receive the hinge pin 7 are located in the respective bosses 1b.

[0053] The frame section 22 is secured to a door frame by means of a datum section 38. The datum section 38 comprises a datum holder 40, a datum sliding section 42 and a frame datum 9. In use, the datum holder 40 is secured to a door frame by fixings (not shown) that extend through openings in the datum holder 40. The datum holder 40 provides a flat surface for attachment of the remainder of the datum section 38 and the hinge to the door frame. Once the datum holder 40 is secured to the door frame, datum sliding section 42 can be slid into the datum holder 42. The datum sliding section 42 is narrower than the datum holder 40 such that the datum sliding section 42 may be held captive by rails present on opposite edges of the datum holder 40. Projections 9b of the frame datum 9 are received in openings in the datum sliding section 42 and datum holder 40 to secure the frame datum 9 to the datum sliding section 42 and datum holder 40. The projections 9b of the frame datum 9 may be a press fit with the openings in the datum sliding section 42 and datum holder 40. That is, the frame datum 9 is located on the datum sliding section 42 and the datum holder 40 by means of projections 9b which are received in predrilled openings in the datum sliding section 42 and datum holder 40. The openings are openings that have been predrilled in the correct locations for the frame datum 9, preferably using a jig. The datum holder 40 may further comprise one or more raised ribs. The raised ribs of the datum holder 40 may be received by one or more corresponding cut-out sections on the datum sliding section 42.

[0054] The datum section 38 may be provided pre-assembled. That is, the datum section 38 may be a pre-assembled unit.

[0055] The frame datum 9 is received in a slot in a rear section of the frame part 1, as shown in figures 9a to 9c. The frame datum 9 has a t-shaped cross-section. The t-shaped cross-section of the frame datum 9 is received in the corresponding t-shaped slot in the rear section of frame part 1. That is, the datum section 38 is slidably received by the frame part 1.

[0056] The width of the rear section of the frame part 1 corresponds to the width of the datum holder 40 of the datum section 38 such that, when assembled, the rear section of the frame part 1 contacts the datum section 38 and does not contact the door frame to which the datum section 38 is secured. In particular, when assembled, the frame part 1 contacts the datum sliding section 42 and the rails present on opposite edges of the datum holder 40.

[0057] Sash part bushes 16 are received in the upper and lower ends of the channel 10d respectively. The necks of the sash part bushes 16 extend into the channel 10d, with the collars of the sash part bushes 16 sitting outside the channel 10d.

[0058] Top frame part bushes 2/4 are received in the upper opening 1c and bottom frame part bushes 3/5 are received in the lower opening 1c in the frame part 1. Only one of the top frame part bushes 2/4 is used at a time, but both are shown for clarity. The same applies to the bottom frame part bushes 3/5. In figure 7 two top frame part bushes are shown (reference numerals 2 and 4) these are two examples of the top frame part bush that can be used. A threaded ring 60 is provided to be positioned between the bottom frame part bushes 3/5 and the bottom cover cap 8. Ring 60 ensures that there is a desirable fit between the bottom frame part bushes 3/5 and the bottom cover cap 8. The ring 60 allows for vertical height adjustment of the hinge plate 10.

[0059] It will be noticed in figure 7 that a hexagonal recess for receipt of a hexagonal section of the hinge pin 7 is offset from a centre line of the top frame part bush 4. This allows for adjustment of the vertical axis of the hinge pin 7 laterally with respect to the frame part 1 by rotation of the top frame bush 4. The amount of adjustment is of the order of 1mm. Similar comments and ability to adjust are present with the bottom frame part bushes 5.

[0060] The hinge pin 7 incorporates a central cut out section 7c in a position corresponding to the break 10e in the hinge plate channel 10d, which facilitates locking of the cover section 15 with respect to the hinge plate 10, as mentioned above.

[0061] Frame part cover caps 8 are located in recesses at the top and bottom parts of frame part 1 in order to cover the upper and lower openings 1c. Spacers 30 ensure that the frame part cover caps 8 have a sufficiently tight friction fit with frame part 1.

[0062] In use during fabrication of the hinged sash on the frame, the hinge is provided as a sub-assembly of the sash section 20 and the frame section 22, with the frame datum 9 removable from its slot in the frame part 1. During fabrication, a fabricator will secure the frame datum 9 to the frame and the fitter slides the combined assembly of the frame section 22 (minus the frame datum 9) and sash section 20 onto the frame datum 9. The fabricator will then pivot the sash section 20 to the sash (window/door) and secure it in position by means of the self-tapping screws received in the openings 11c.

[0063] Figures 9a to 9d show the connection means between the cover section 15 and the hinge plate 10. The hinge plate 10 comprises a recess section 100 which forms a lip 102. The recess section 100 and lip 102 are formed on a side of the hinge plate 10 furthest away from the channel 10d in the hinge plate 10. The cover section 15 comprises a recess 104 of a corresponding shape to the lip 102 to allow for interengagement of the two. The recess 104 is formed on an inner surface of the cover section 15. The recess 104 cooperatively engages with the lip 102 to prevent the hinge plate 10 from separating from the cover section 15, as will be described below.

[0064] The cover section 15 (see Figure 8a) comprises end apertures 15c of fixed size to hold the cover section 15 captive on the hinge section 22. The end apertures 15c are substantially cylindrical. Each of the apertures 15c have an end ring 110. The diameter of the end apertures 15c is larger than the diameter of the hinge pin 7. The end rings 110 aid the holding of the cover section 15 captive on the hinge pin 7 and within the recess 1a. The end rings 110 act as a washer to allow the cover section 15 to rotate. The hinge pin 7 is further held captive by the holding section 50 during installation of the hinge. The holding section 50 prevents the hinge pin 7 from moving along the longitudinal axis A-A' during installation. Once the hinge is installed, the holding section 50 may be removed.

[0065] The cover section 15 further comprises a centre portion 15e. The centre portion 15e comprises a central aperture 15f that is substantially oval or oblong. The central aperture 15f holds the cover section 15 captive on the hinge pin 7. The central aperture 15f and the end apertures 15c are sized such that the cover section 15 is allowed some movement relative to the hinge pin 7 and hinge plate 10 in an axis substantially perpendicular to the longitudinal axis A-A' of the hinge pin 7. The centre portion 15e is located within the channel break 10e of the hinge plate 10.

[0066] The centre point of the end apertures 15c and the central aperture 15e lay substantially along the same line to accommodate the hinge pin 7. That is, the hinge pin 7 may freely pass through all three apertures, to allow the cover section 15 (and the sash section 20) to be attached to the frame part 1. The size of the central aperture 15e is smaller than the size of the end apertures 15c. The central aperture 15f is aligned with the cut-out section 7c of the hinge pin 7.

[0067] As described above, the centre portion 15e comprises a threaded bore 15a. The threaded bore 15a is sized to receive the screw 17. The screw 17 may be tightened such that the screw contacts the cut-out section 7c of the hinge pin 7.

[0068] When the screw 17 is tightened, the screw 17 advances through the threaded bore 15a towards into the central aperture 15e, before contacting, or almost contacting, the cut-out section 7c of the hinge pin 7. When the screw 17 is tightened to its most advanced postion, the screw 17 is in the closed position. In the closed position, the diameter created by the screw 17 and the central aperture 15e is smaller than the normal diameter of the hinge pin 7. When in the closed position, the hinge pin 7 may not be removed from the end apertures 15c and the central aperture 15e. This occurs because the cut-out section 7c of the hinge pin has a smaller diameter than that of the rest of the hinge pin 7. Therefore, if a person attempted to remove the hinge pin 7 by moving it along its longitudinal axis A-A', without first removing the screw 17, the screw 17 would abut either end of the

cut-out section 7c, and would not be removable, because the effective diameter created by the screw 17 and the central aperture 15e is smaller than the normal diameter of the hinge pin 7. That is, the sash section 20 is locked with and secured to the frame part 1. In the closed position, the screw 17 does not restrict the movement of the cover section 15 around the axis of the hinge pin 7. In the closed position, the screw 17 allows some movement of the cover section 15, with respect to the hinge pin 7, most usefully in a direction substantially perpendicular to the longitudinal axis A-A' of the hinge pin 7. The screw 17 may be referred to as the first locking element.

[0069] When the screw 17 is untightened, the screw retracts from the cut-out section 7c, the central aperture 15e and the threaded bore 15a. When the screw 17 is no longer protruding into the central aperture 15e, the screw 17 is in the unlocked position. In the unlocked position, the diameter of the central aperture 15e is unaffected by the screw 17 and would allow the hinge pin 7 to pass through unobstructed. Therefore, in order to allow the removal of the hinge pin 7, and therefore the separation of the sash section 20 from the frame part 1, the screw 17 must be in the unlocked position.

[0070] Access to the screw 17 is only possible from the internal side of the door when the door is open. Therefore, a person trying to tamper or remove the hinge completely would be unable to do so without first accessing the internal side of the door, and opening it. The cover section 15 comprises a fixing 106 that is received in the corresponding fixing receiving section 15b on the inside of the cover section 15.

[0071] The fixing 106 comprises a spring 106a, a collar 106b and a pin 106c. The pin 106c comprises a narrower body and a wider head. The spring 106a is located around the body of the pin 106c. The collar 106c is recessed on one end, forming an inner face, such that the body of the pin 106c may pass through the collar 106c completely and the head of the pin 106c may pass into the recessed section of the collar 106c until the head of the pin 106c is contained completely within the recessed section and one side of the head of the pin 106c is abutted against the inner face of the recess of the collar 106c. The fixing 106 may be referred to as the second locking element.

[0072] The receiving section 15b comprises a stepped section forming a wider, proximal section 15g and a narrow, distal section 15h of the receiving section 15b, and a shoulder 15i in-between. The wider section 15g of the receiving section 15b is located proximal to the opening of the receiving section 15b. The narrower section 15h of the receiving section 15b is located distal to the opening of the receiving section 15b.

[0073] The body of the pin 106c is sized to extend through the wider, proximal section 15g of the receiving section 15b and into the narrower, distal section 15h of the receiving section 15b. The body of the pin 106c is the only part of the fixing 106 that may extend into the narrower, distal section 15h of the receiving section 15b.

[0074] The spring 106a is located around the body of the pin 106c. One end of the spring 106a abuts the shoulder 15i between the proximal 15g and distal 15h ends of the receiving section 15b. The other end of the spring 106a abuts the collar 106b. The spring 106a may move between a compressed and an extended position. When the spring 106a is in the compressed position, the fixing 106 is in its compressed (unlocked) position. When the spring 106a is in the extended position, the fixing 106 is in its extended (locked) position.

[0075] The spring 106a is biased towards the extended orientation, as shown in figure 9a. That is, the fixing 106 is biased towards the closed position. In the extended orientation, the collar 106b extends out of the proximal end of the receiving section 15b and into the break 10e in the hinge plate channel 10d. A user may apply a force to the collar 106b, causing the spring 106a to compress and the collar 106b to retract into the receiving section 15b. When the fixing 106 is in the compressed (unlocked) position, the recessed end of the collar 106b sits flush with the opening of the receiving section 15b.

[0076] During movement between the unlocked and locked positions, the pin 106c of the fixing 106 is static. In the closed position, one side of the head of the pin 106c is flush with the opening of the receiving section 15b. An other side of the head of the pin 106c is abutted against the inside face of the recess of the collar 106b. In the locked position, one side of the head of the pin 106c is flush with the opening of the receiving section 15b. An other side of the head of the pin 106c is away from the inside face of the recess of the collar 106b, due to the movement of the collar 106b towards the distal end 15h of the receiving section 15b.

[0077] As described above, the fixing 106 may move between a compressed (unlocked) position (see figure 9b) and an extended (locked) position (see figure 9a). In the extended (locked) position, the fixing 106 extends out of the proximal end 15h of the receiving section 15b into the break 10e in the hinge plate channel 10d. In the compressed position, the fixing 106 does not extend into the break 10e in the hinge plate channel 10d. The fixing 106 may be moved into the compressed position by a user, by, for example, pressing the fixing 106.

[0078] When the fixing 106 is in the compressed (unlocked) position the cover part 15 may be moved, by a user, from a position in which the hinge pin 7 is at one end of the central aperture 15f, to a position in which the hinge pin 7 is at the other end of the central aperture 15f. This movement is facilitated by the non-circular shape of the central aperture 15f. This movement removes the lip 102 of the hinge plate 10 from the recess 104 of the cover part 15, thereby allowing the cover part 15 to move freely about the axis of the hinge pin 7 with respect to the hinge plate 10. When the fixing 106 is in the unlocked position, the cover part 15 may be moved between open and closed positions, as shown in figures 9b and 9c.

[0079] As shown in figures 9a and 10a, the fixing 106, hinge plate 10 and cover section 15 may be in a closed and locked configuration with respect to each other. A

user may press the fixing 106 (as shown in figure 10b) from the extended (locked) position to the compressed (unlocked) position, to allow the cover section 15 to move with respect to the hinge plate 10 (unlocked configuration). Once in the unlocked configuration (i.e. when the fixing 106 is not protruding into the break 10e), the cover section 15 may be moved (laterally) with respect to the hinge plate 10, such that the relative position of the hinge pin 7 moves from one end of the central aperture 15f to the other end of the central aperture 15f. The movement will also cause the relative position of the hinge pin 7 to move from one end of the end apertures 15c to the other end of the end apertures 15c. This movement disengages the lip 102 of the hinge plate 10 from the recess 104 of the cover part 15 (see figures 9b and 10c). The cover part 15 may then freely rotate about the hinge pin 7, with respect to the hinge plate 10, to move from the closed position to an open position (see figures 9c and 10d).

[0080] The hinge plate 10 and the cover section 15 may be returned to the closed and locked configuration (from the open and unlocked position) by sliding the cover section relative to the hinge plate 10, causing the lip 102 to re-engage the recess 104, thereby allowing the fixing 106 to default to its locked position where the collar 106b of the fixing 106 extends into the break 10e in the hinge plate channel 10d.

[0081] As described above, the screw 17 acts to fix the cover part 15 to the hinge pin 7, and still allows for movement, in the direction perpendicular to the longitudinal axis A-A' of the hinge pin 7 and about the axis of the hinge pin 7, of the cover part 15 with respect to the hinge plate 10 even when the screw 17 is in the closed position.

[0082] Therefore, the locking mechanism of the sash section 20 to the frame part 1 is separate to the locking of the cover section 15 with respect to the hinge plate 10. That is, the locking of the sash section 20 and frame part 1 is performed by the screw 17, whereas the locking of the cover section 15 and the hinge plate is performed by the fixing 106.

[0083] Although the above example is related to a hinge with lateral adjustment means, the cover section 10 could be used with a door hinge without the lateral adjustment.

[0084] During the fitting of the hinged sash and frame, a fitter will remove the sash and hinge from the frame, leaving the frame datum 9 in position. The fitter fits the frame to the building or structure. The fitter can then fit the sash in two ways.

[0085] Where there is room for vertical movement the fitter lifts the sash and offers it to the frame datum 9 so that the frame part 1, in particular, the slot (not shown) therein slides over the frame datum 9. The cover section 15 is then locked in place as described above, to thereby prevent the sash being lifted from the hinge.

[0086] Where there is insufficient room for vertical movement, the fitter can unscrew the screw 17. Unscrewing the screw 17 allows the fitter to knock out the hinge pin 7 from below before fitting the frame, which frees the sash and sash section 20 from the frame section. The fitter then slides the remainder of the frame section 22 onto the frame datum 9. The sash with sash section 20 fitted is then offered to the frame section 22 and the hinge pin 7 is knocked back into position in a friction fit, and the screw 17 is screwed into place. This method allows the sash to be fitted with minimal vertical movement of the sash relative to the frame.

[0087] Thereafter, the lateral adjustment pinion 12 which engages with the rack in slot 10b is adjusted laterally. When the correct lateral position is achieved, then the lock off screw 15 is tightened in the locking opening 10c and the locking opening 11b in the sash datum to secure the sash datum with respect to the hinge plate 10.

[0088] The hinge plate 10 and sash datum 11 are seated together by means of interengaging ridges shown around the periphery of the locking opening 10c. Corresponding ridges are present on the rear face of the sash datum 11, not shown in figure 7. The provision of the ridges allows for good seating of the hinge plate 10 with the respect of the sash datum 11.

[0089] When all adjustment has been completed the cover section 15 can be locked into position over the hinge plate 10 and sash datum 11 as mentioned above.

[0090] A method of fitting the hinge comprises a first step 402 of, when the hinge is in a closed position, releasing a cover section 15 from a frame section 22 by operating a first locking element; wherein a second locking element is in a locked configuration. The method may comprise a second step 404 of adjusting the cover section 15 with respect to the frame section 22.

[0091] Significant advantages result from the hinge described herein in that the sash datum and hinge plate 10 are held together but allowed to be loose relative to one of each other by means of the inner housing 14. In addition, the location of the lateral adjustment pinion 12 on a front face of the sash datum allows for easy adjustment of the sash datum and hinge plate 10 relative to each other, instead of adjustment of those two parts relative to each other from the end section thereof.

[0092] In addition, the provision of three main elements (sash section 20, frame section 22 and hinge 7) with which a fitter works provides considerable advantage in the parts that are not loose with respect to one another and do not have to be assembled on site. This is achieved by adding the bushes 16 with a friction fit in the channel 10d in the hinge plate 10, as well as a friction fit bushes 2/4 and 3/5 in the respective openings in the frame part 1. Also, the fitter has the option of fitting in either of the two ways mentioned above. Furthermore, the fabricator does not need to use a complicated jig to mark the location of the sash section 20 on the sash. Instead, the location is dictated by the sash section 20 being provided attached to the hinge section 22, so the sash section can simply be folded onto the sash during fabrication. With the sash in position in the frame, the sash is effectively held in the correct location without further measurement.

[0093] The hinge offers the advantageous feature of

allowing adjustment by removal of the hinge pin.

[0094] Advantages of the cover section locking mentioned above are that the cover section 15 is secured in position at both ends thereof. At one end the lip 102 locks the cover section 15 to the hinge plate 10, at the other end apertures 15c and 15f secure the cover section 15 to the hinge pin 7 and so the frame part 1. This reduces the risk of using a lever to prise one end of the cover plate off and allow access to the internals of the hinge mechanism for removal, which could be the case if only one end of the cover section 15 was secured in position.

[0095] Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0096] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0097] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0098] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A hinge comprising:

a sash section securable to a sash, the sash section comprising a cover section and a hinge plate; and
a frame section securable to a frame, the frame section comprising a hinge pin and a frame part,
wherein the sash section and the frame section are mounted for relative rotation,
wherein the cover section is releasably secured relative to the frame section by means of a first locking element,
wherein the cover section is releasably secured relative to the sash section by means of a second locking element, and
wherein the first locking element is located at the hinge pin, and the second locking element is remote from the hinge pin.

2. The hinge according to claim 1, wherein the first locking element, when in a locked configuration, prevents the hinge pin from being removed.

3. The hinge according to any of the preceding claims, wherein the first locking element, when in a locked configuration, prevents movement of the cover section, relative to the sash section, in a direction parallel to the longitudinal axis of the hinge pin.

4. The hinge according to any of the preceding claims, wherein the first locking element, when in a locked configuration, allows movement of the cover section, relative to the sash section:

in a direction perpendicular to the longitudinal axis of the hinge pin, and
about the axis of the hinge pin.

5. The hinge according to any of the preceding claims, wherein the hinge plate comprises a channel, wherein the first locking element extends through a break in the channel of the hinge plate.

6. The hinge according to any of the preceding claims, wherein the cover section comprises a centre portion and two end apertures.

7. The hinge according to any of claim 6, wherein the centre portion further comprises a central aperture, and
wherein the centre point of the end apertures and the central aperture lay substantially along the same line, such that the hinge pin may pass freely through all three apertures.

8. The hinge according to any of the preceding claims, wherein the second locking element, when in a locked configuration, prevents relative movement of the cover section and the hinge plate.

9. The hinge according to any of the preceding claims, wherein the hinge plate comprises a lip, and wherein the cover section comprises a corresponding recess formed on an inner surface of the cover section.

10. The hinge according to claim 9, wherein, when in a locked configuration, the lip of the hinge plate and the recess of the cover section are cooperatively engaged, to prevent the hinge plate and the cover section from separating.

11. The hinge according to claim 9, wherein, when in an unlocked configuration, the lip of the hinge plate and the recess of the cover section are disengaged, to allow the hinge plate and the cover section to move

relative to each other.

12. The hinge according to any of the preceding claims, wherein the second locking element further comprises a spring, a collar and a pin.

13. The hinge according to claim 12, wherein the collar is recessed at one end, forming an inner face, such that the body of the pin may pass through the collar completely, and the head of the pin may pass into the recessed section until the head of the pin is contained completely within the recessed section of the collar, and one side of the head of the pin is abutted against the inner face of the recess of the collar.

14. The hinge according to any of the preceding claims, wherein the hinge further comprises a datum section, wherein the datum section is securable to a door frame, and wherein the frame section is configured to be slidably received by the datum section.

15. A method of fitting a hinge comprising the steps of:

when the hinge is in a closed position, releasing a cover section from a frame section by operating a first locking element;
wherein a second locking element is in a locked configuration.

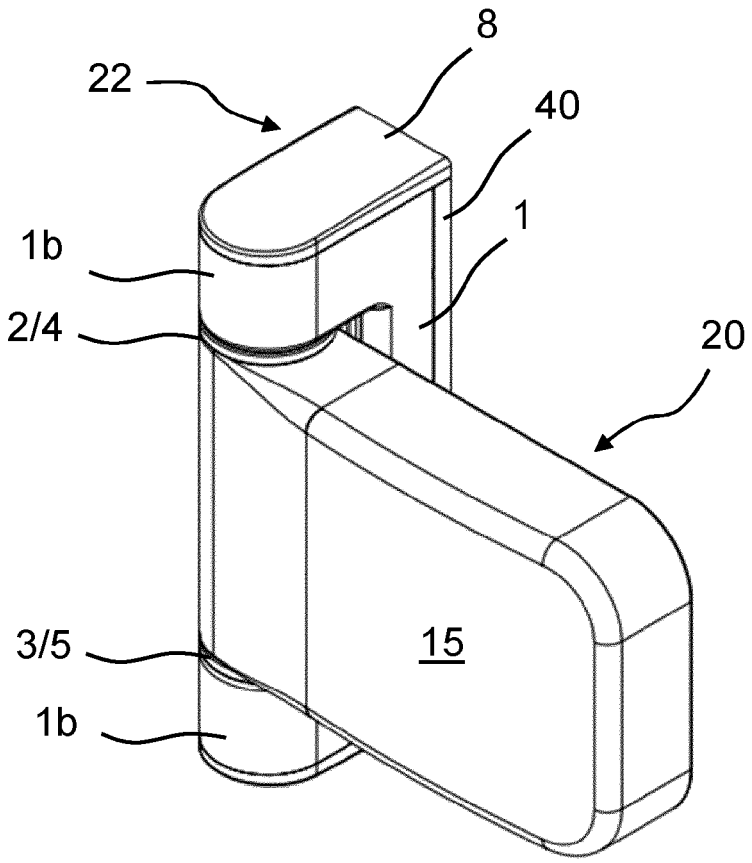


Figure 1

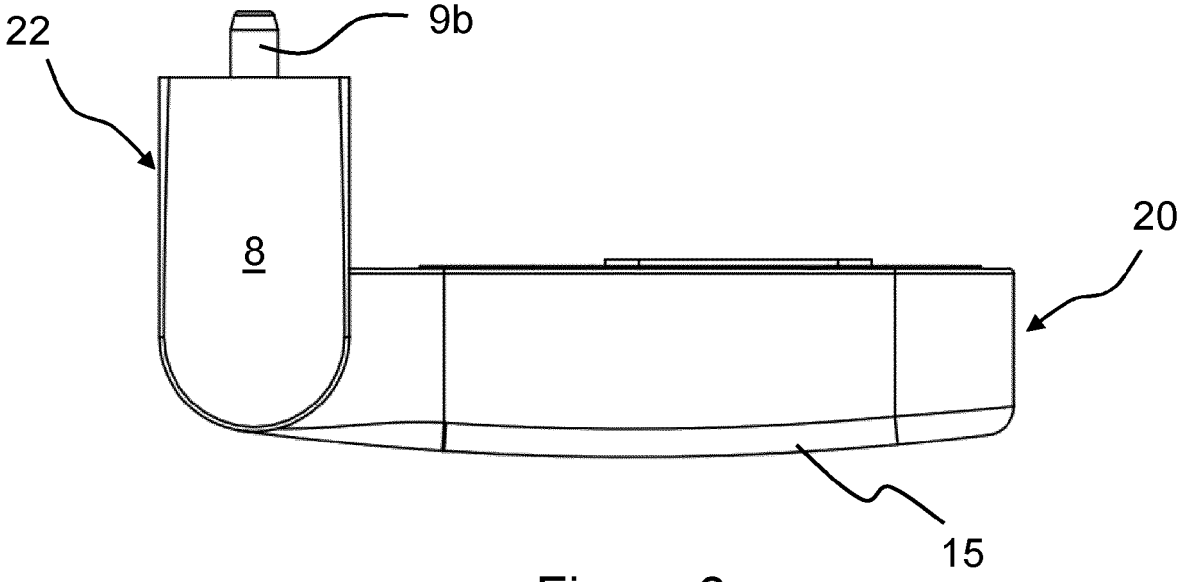


Figure 2

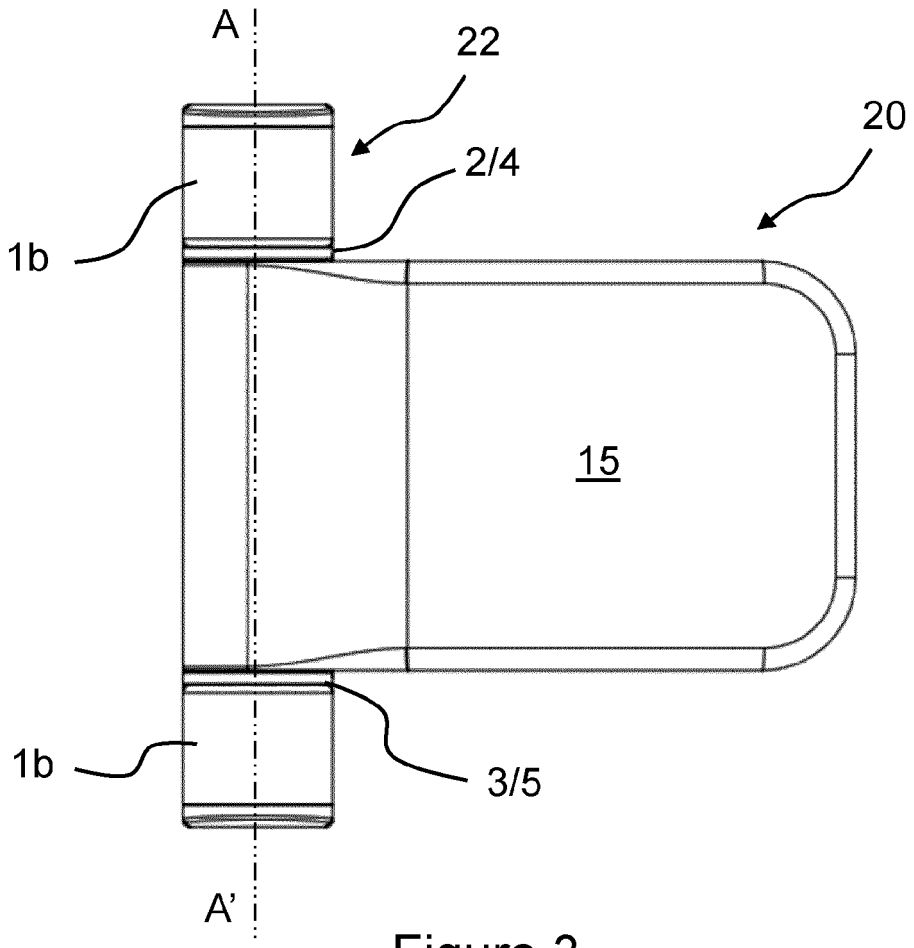


Figure 3

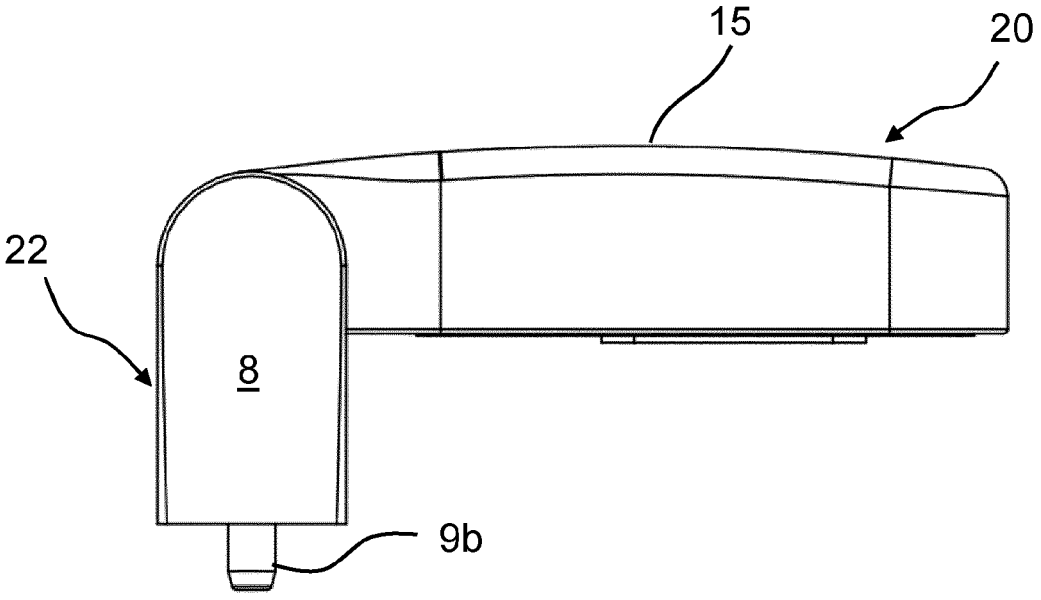


Figure 4

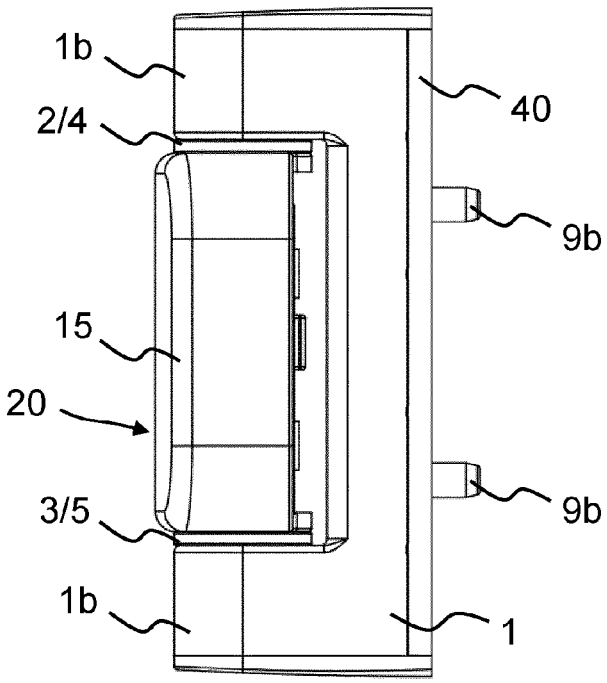


Figure 5a

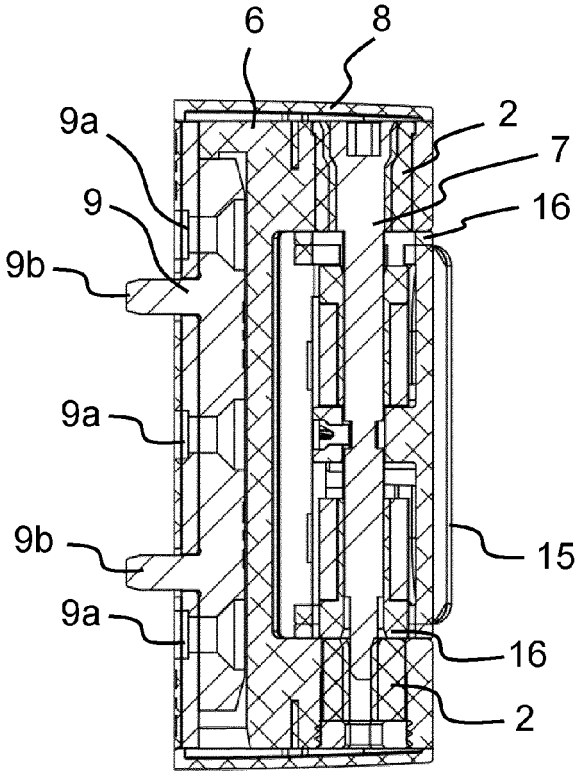
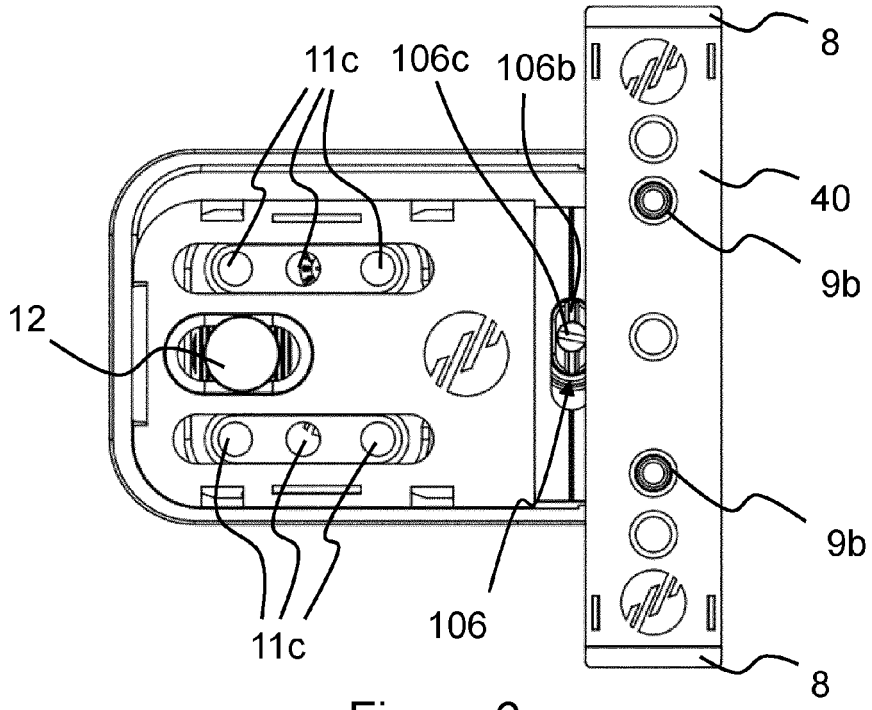


Figure 5b



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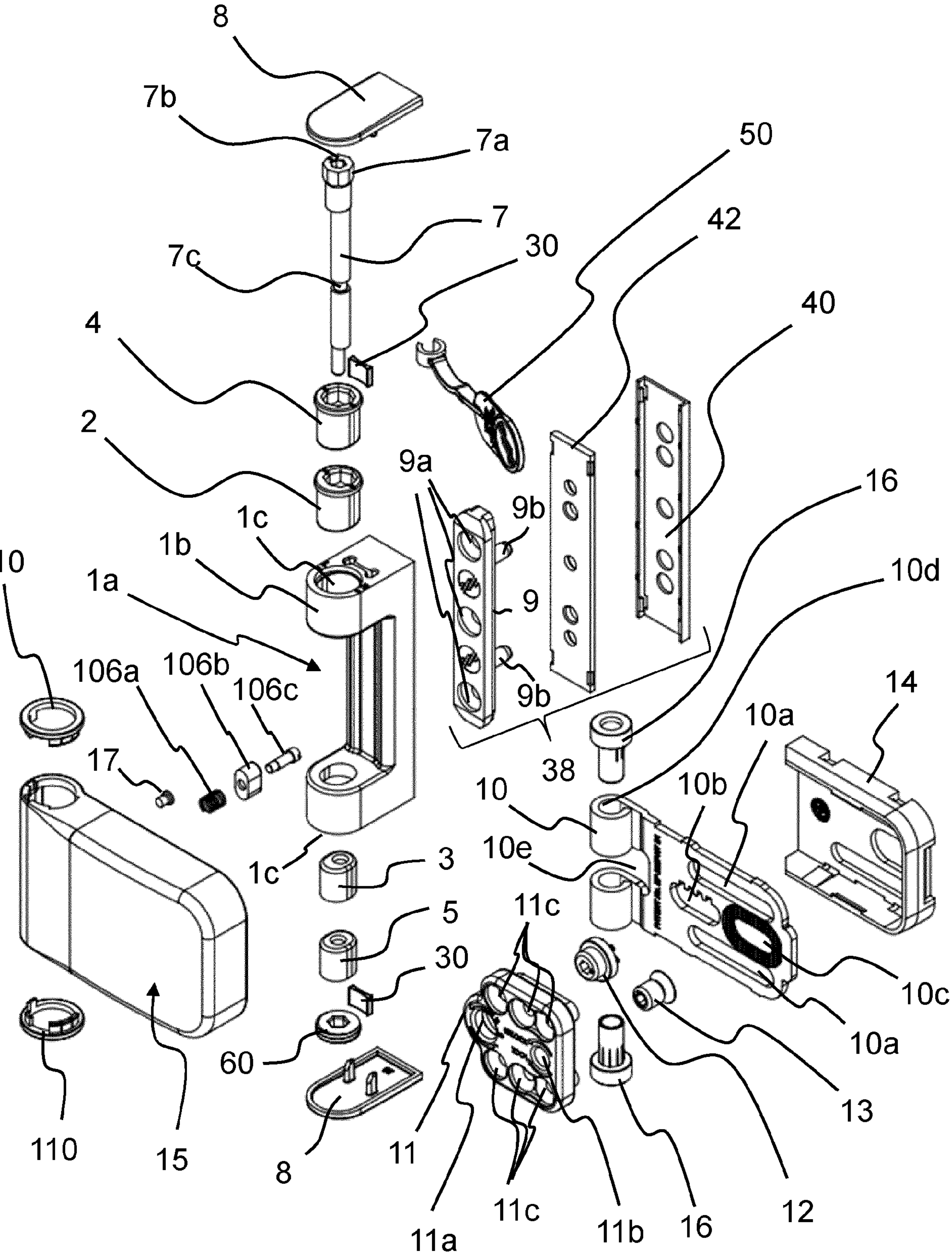
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7
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9b
1c
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9
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10d
106a
106b
106c
9b
14
10a
17
38
10b
10
10e
1c
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16
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Figure 7

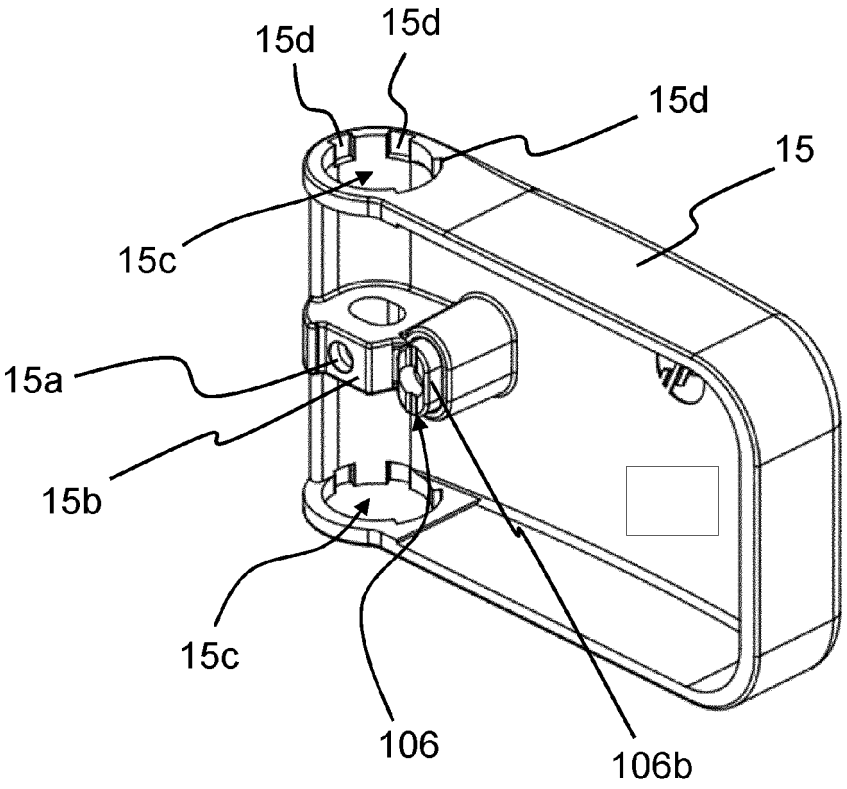


Figure 8a

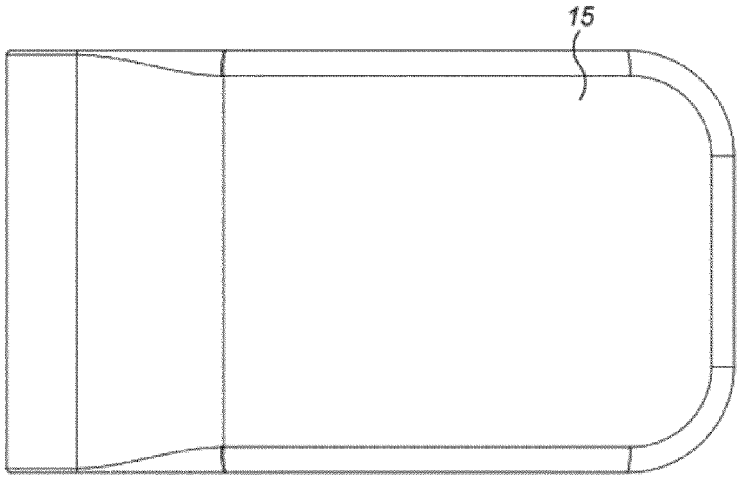


Figure 8b

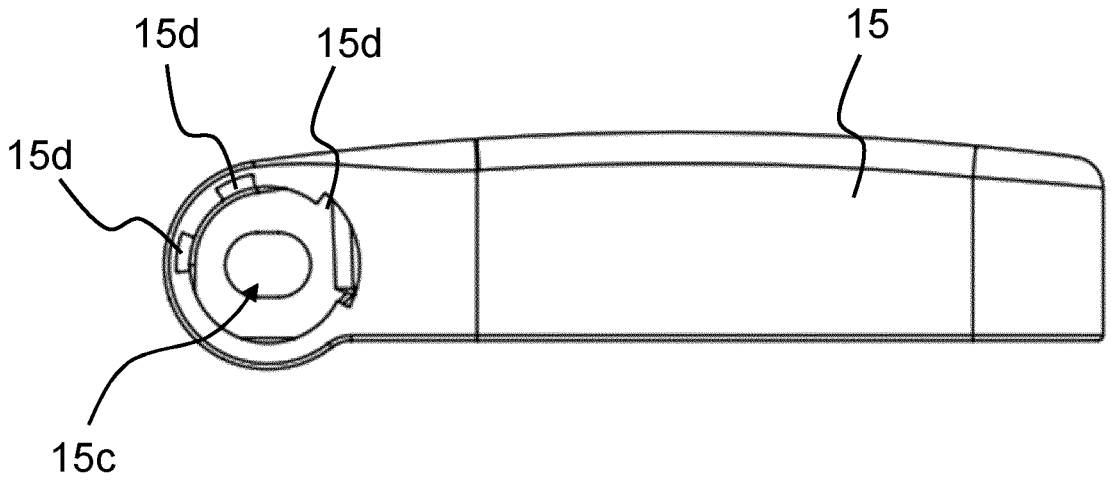


Figure 8c

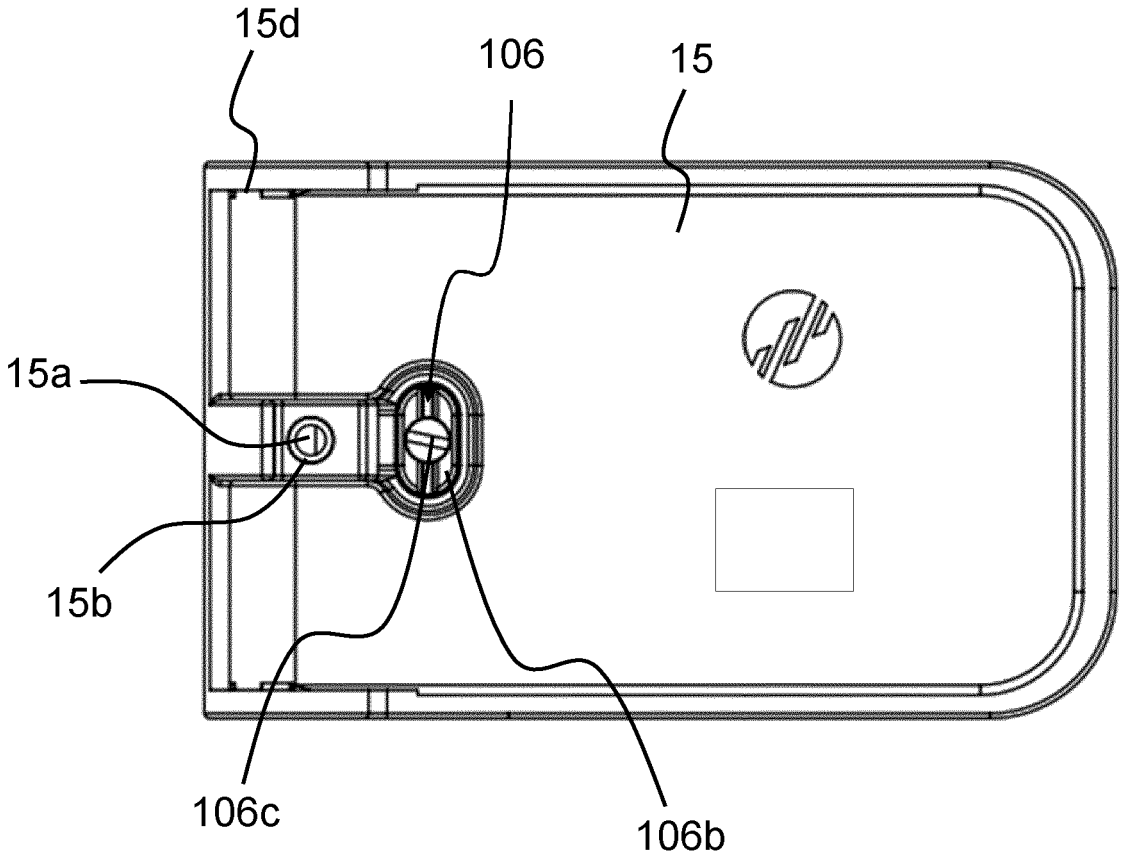


Figure 8d

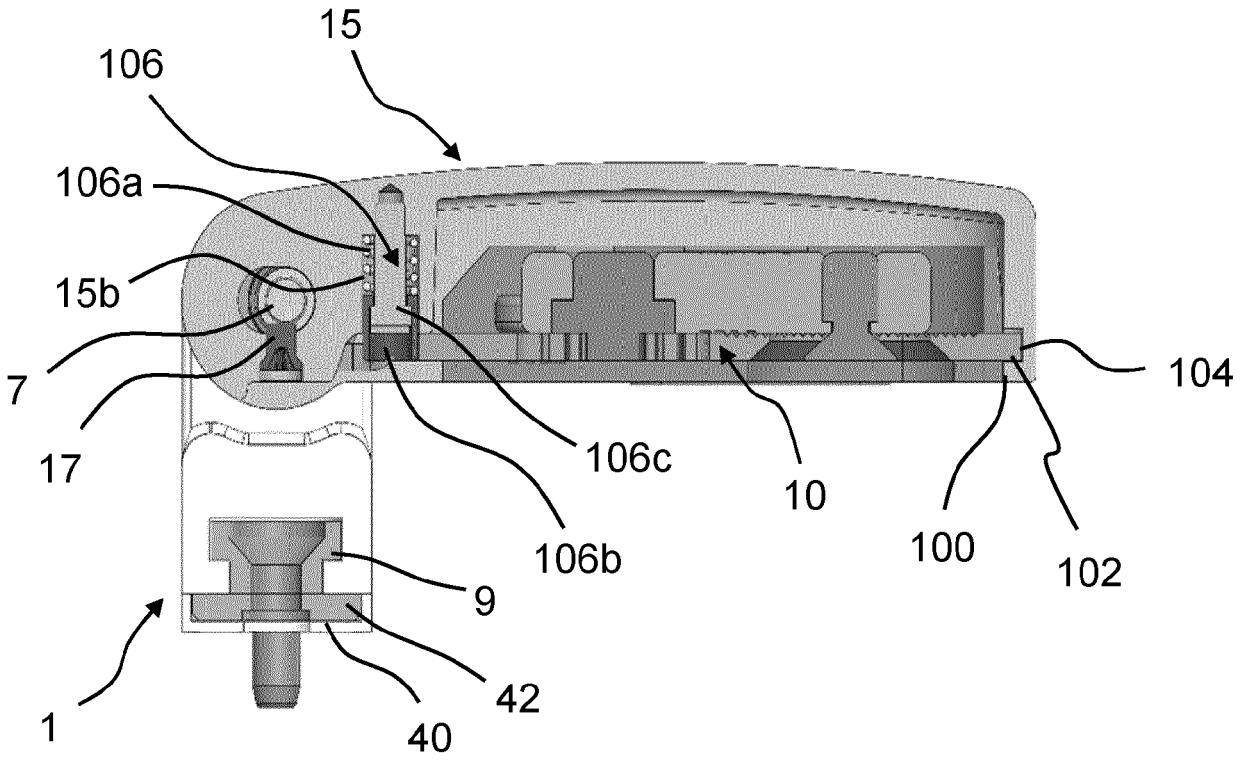


Figure 9a

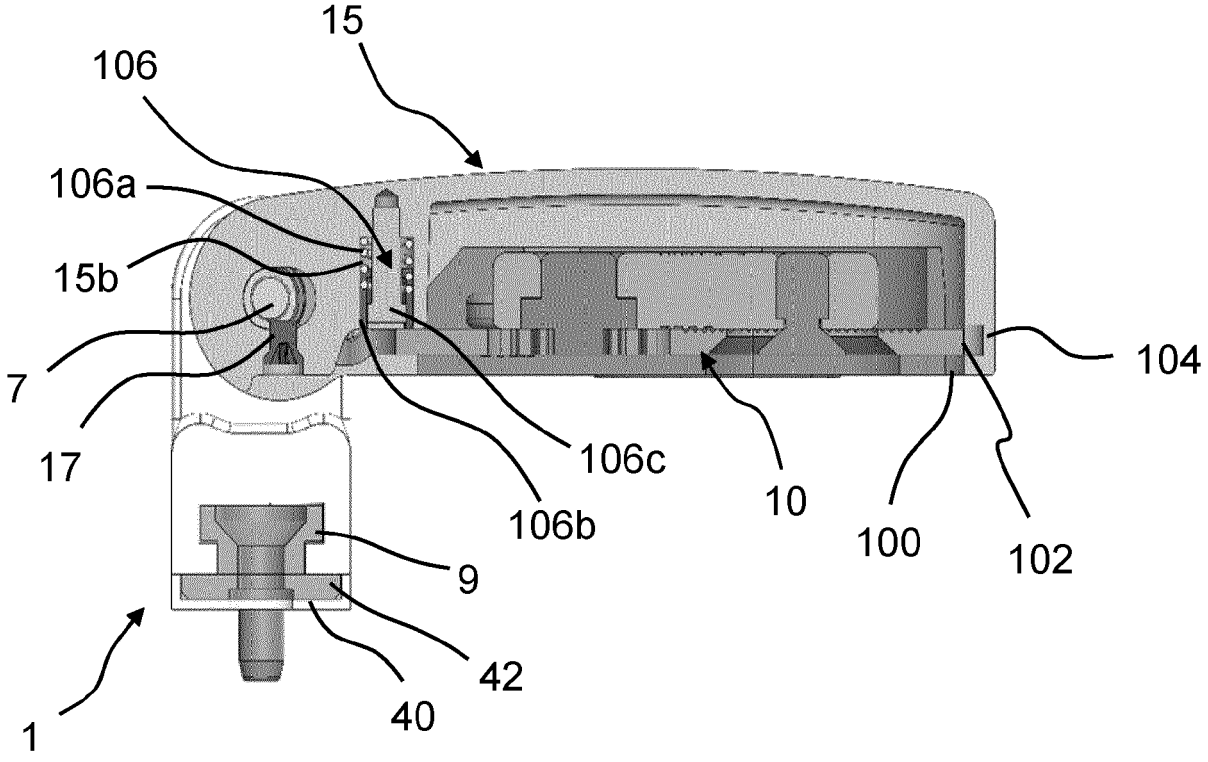


Figure 9b

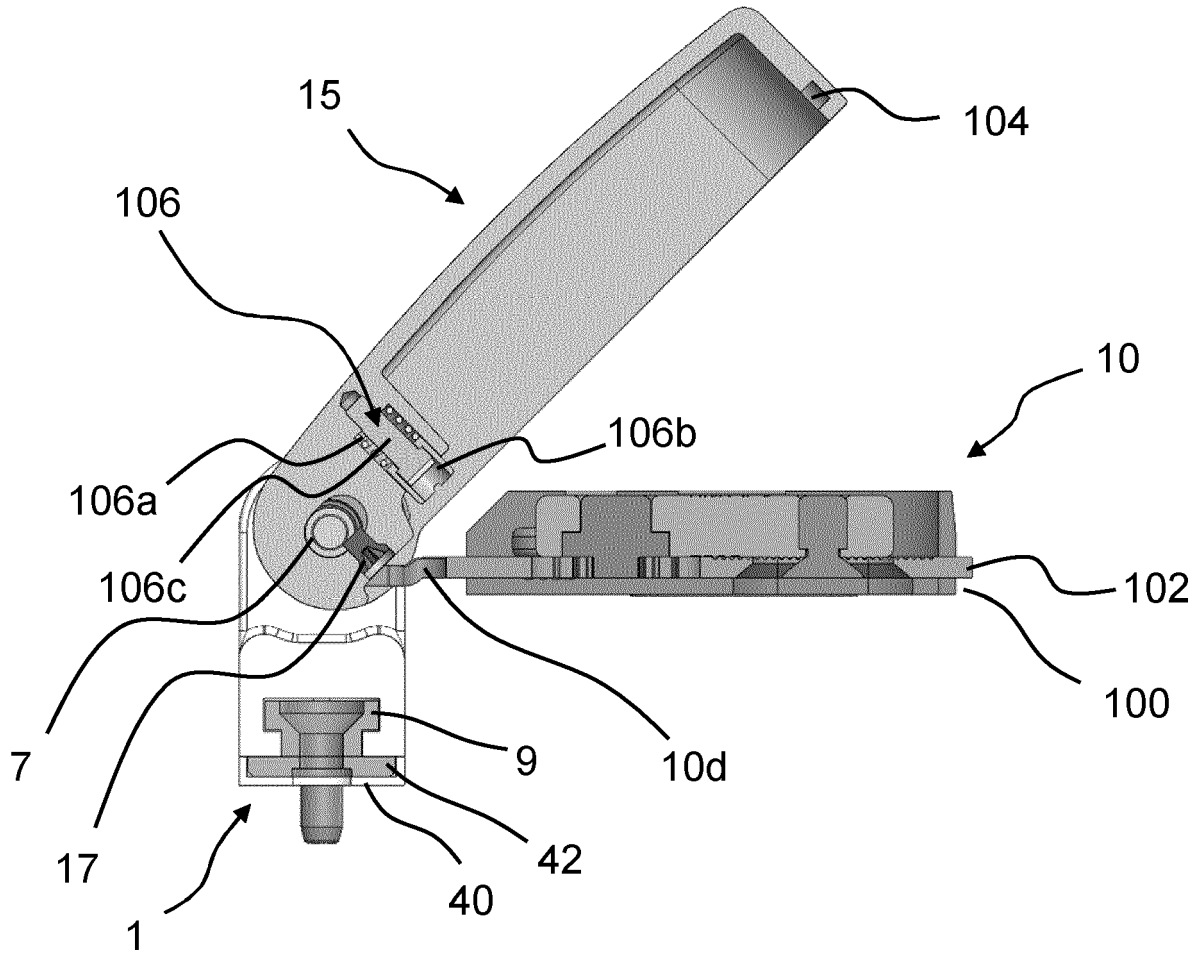


Figure 9c

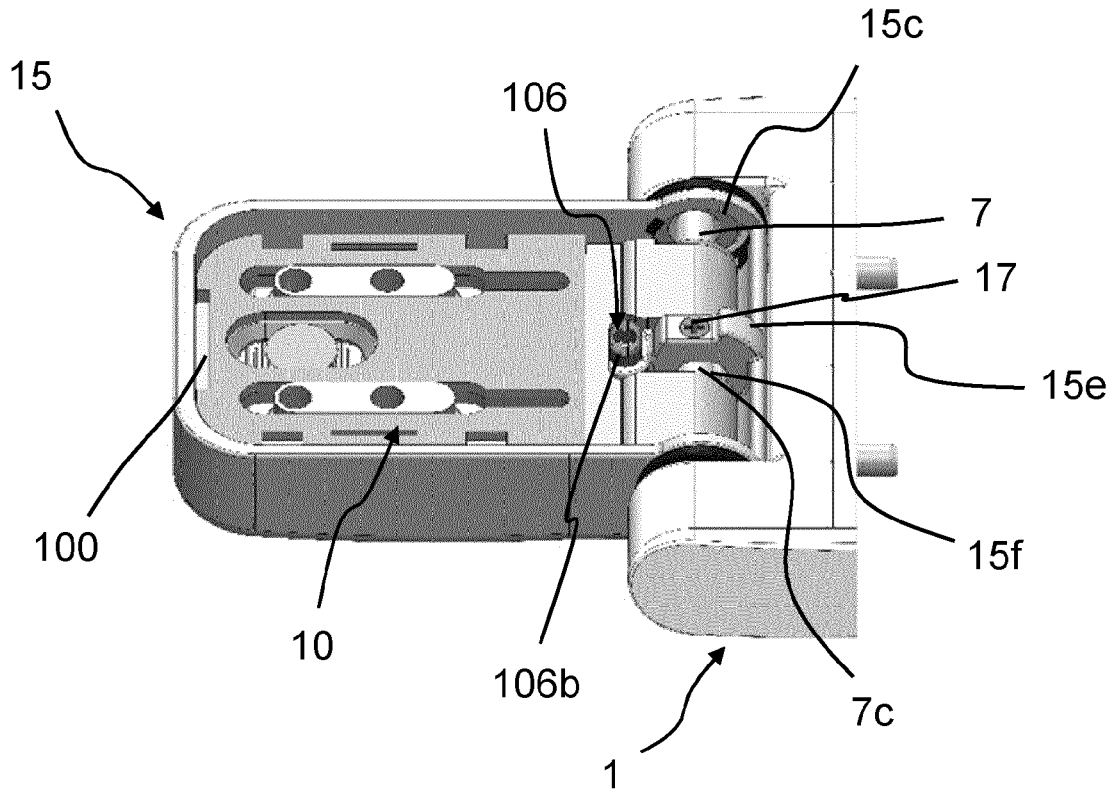


Figure 10a

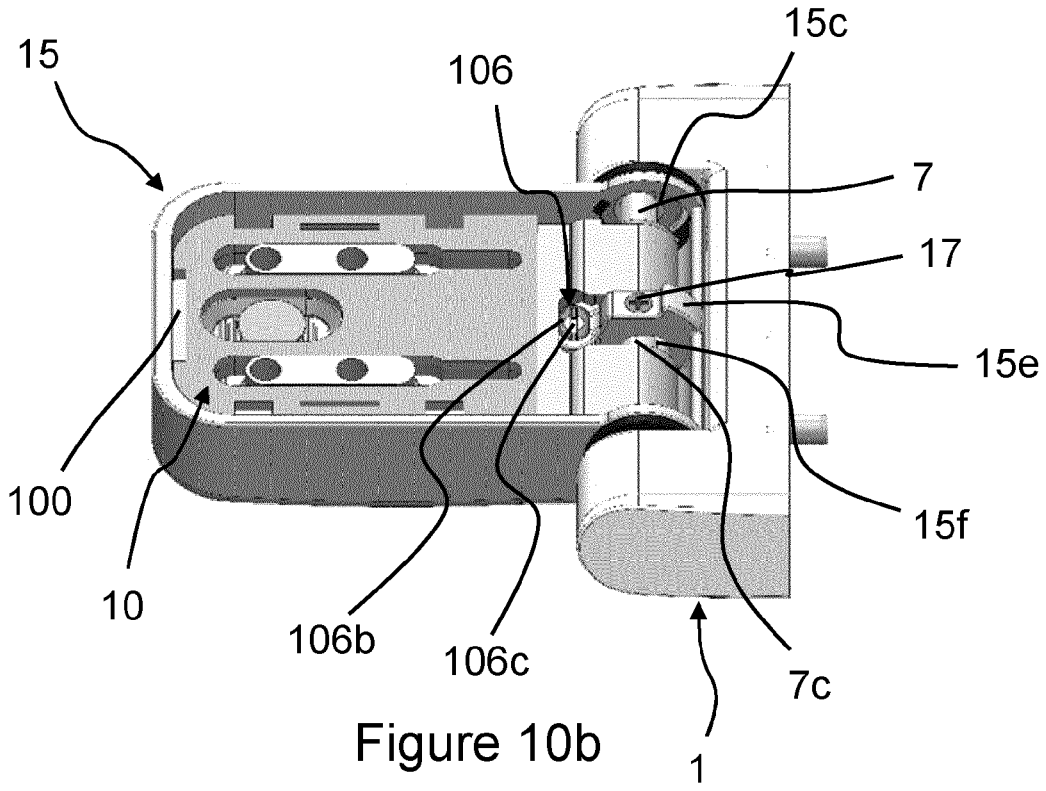
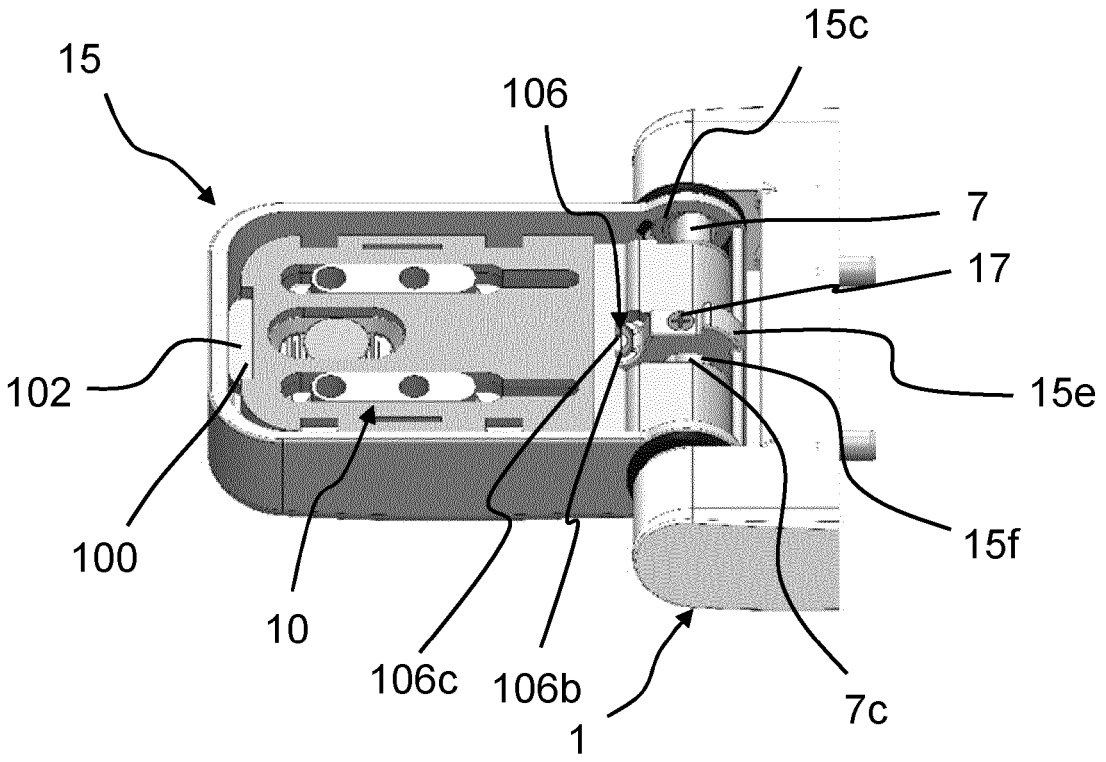


Figure 10b



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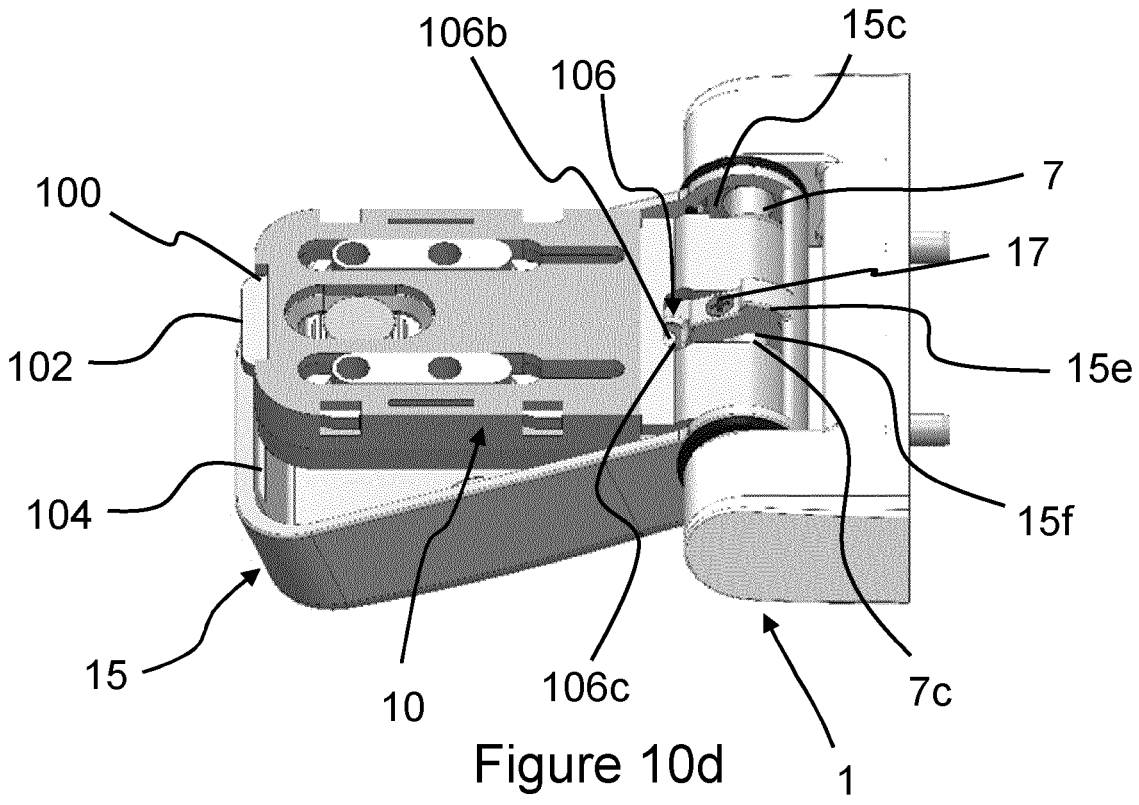

Figure 10d

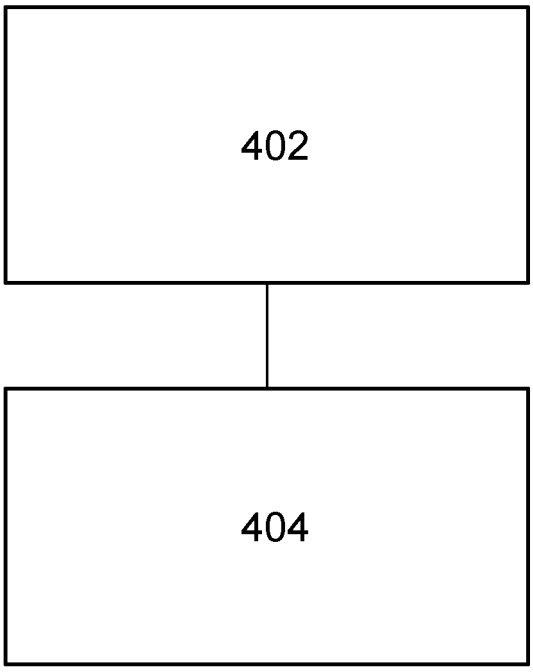

Figure 11

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EUROPEAN SEARCH REPORT

Application Number
EP 23 19 9678

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	* page 13, paragraph 3; figures 8,10-12,17 * * page 15, paragraph 2 *	4-7,12, 13	
X	GB 2 383 081 A (J K FURNEX LTD [GB]; LAIRD SECURITY HARDWARE LTD [GB]) 18 June 2003 (2003-06-18)	1-3,5,8, 14,15	
A	* page 11, line 15 - page 12, line 15; figures 1,2,5 *	4,6,7, 9-13	
X	EP 3 680 432 A1 (SFS INTEC HOLDING AG [CH]) 15 July 2020 (2020-07-15) * paragraphs [0028], [0042]; figures 2,14 *	1-3,8,15	
Y	GB 2 511 282 A (TROJAN HARDWARE & DESIGN LTD [GB]) 3 September 2014 (2014-09-03) * the whole document *	1-15	TECHNICAL FIELDS SEARCHED (IPC)
Y	EP 0 698 710 B1 (HAHN GMBH & CO KG DR [DE]) 27 May 1998 (1998-05-27) * column 4, line 24 - column 6, line 32; figures 1-6 *	1-15	E05D
A	FR 2 898 930 A1 (SARL IMPAR SARL [FR]) 28 September 2007 (2007-09-28) * figures 10-13 *	1-15	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 February 2024	Berote, Marc

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 23 19 9678

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