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(54) **Fastener for a window or a door**

Schliessvorrichtung für ein Fenster oder eine Tür

Dispositif de fermeture pour une fenêtre ou une porte

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(56) References cited:
**EP-A1- 1 321 604 EP-A2- 0 521 490
CN-U- 202 380 809 DE-C- 222 439
GB-A- 191 100 028 US-A- 68 956
US-A1- 2005 156 441**

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Description

[0001] This invention relates to developments in fasteners for windows and doors.

[0002] Fasteners for windows and doors are well known in the art in a number of designs. The traditional design is a simple rotatable lever attached to the window which moves a rotational bolt into a recess in the window frame. These types are frequently made from cast metal although other methods could be used. Typically the rotational bolt is rotationally attached to a base plate by which the fitting is attached to a window. A spigot extends from the rotational bolt for attachment to the handle. A handle of this type is shown in Figure 1.

[0003] More recently there has been a move towards multi point window locks using espagnolette type mechanisms. For this type of windows the handle is usually fitted at the point of manufacture and is usually specified when specifying the windows. When building the windows the handle is chosen from the available designs. Due to the volume and throughput the window manufacturer usually has ample stock of the different available closure designs. The handle is usually integrated with the fitting prior to assembly, often during manufacture, and the whole fitting attached to the window. An example of such a fitting is shown at Figure 2.

[0004] However, in top end window products, in particular steel or aluminium framed windows that are design imitations of historic windows, but which are made to modern standards, it is often a requirement that the window handles are made to a specific, sometimes bespoke, design so as to maintain the character of the windows. These windows are often required to be used when renovating historic or protected buildings where it is required to maintain the character of the building with minimum visual change. These more bespoke type windows have the same or similar type espagnolette fasteners as other modern windows and the same types of fittings as shown in Figure 2 are usually used, albeit with a different visual appearance. Accordingly, aside from the standard modern handle designs that window manufacturers carry in stock, there may be many design variants, both in actual shape and in finish, from which the handle can be chosen for these specialised windows. As these are specialised low volume products and are usually high value items window manufacturers do not usually carry any stock of them and order them specifically when needed, this can create long lead times when manufacturers are asked to produce bespoke windows with specific designs of handle. This can delay renovation projects for historic or protected buildings, which has inevitable financial implications for the people renovating the building, which in many cases may be charitable organisations.

[0005] German patent application DE222439, British patent application GB00028, and US application US68956 disclose various methods of affixing door knobs or handles onto a tapered spindle extending through a door. European application EP1321604 dis-

closes a method of attaching a handle to a door or window leaf, the handle comprising a spindle and two projections which extend through the frame and receive fixing screws. US application US2005/0156441 and Chinese Utility Model CN202380809 disclose handles for windows or doors, wherein the handle is retained on a boss plate by a circlip.

[0006] It is the purpose of the present invention to provide an alternative closure design that at least partially mitigates some of the above mentioned problems with existing designs.

[0007] According to the invention there is provided a fastener for a closure according to claim 1.

[0008] The taper may be a machine taper, preferably a Morse taper. The taper can retain the handle on the shaft.

[0009] The shaft may be provided with at least one key extending therefrom.

[0010] The taper may be provided with a recess therein for receiving a further fastener. The further fastener may be a screw. The screw may be a grub screw. The recess may be provided with a thread. The further fastener may be a grub screw that fastens to the thread.

[0011] The taper may have flat sides, or alternatively taper may have curved sides.

[0012] The fastener further comprises a handle. The handle is provided with a tapered hole therein for receiving said second end of the shaft. The taper may be a Morse taper matched to the taper on the second end of the shaft to retain the handle on the shaft. The tapered hole may comprise a blind tapered hole.

[0013] The internal shape of the tapered hole preferably conforms to the external shape of the taper on the pivotal shaft.

[0014] In one arrangement the tapered hole may have a chamfered inlet edge and the shaft may be provided with a corresponding chamfer at the base of the shaft.

[0015] In another arrangement the internal shape of the tapered hole preferably conforms to the external shape of the taper on the second end of the pivotal shaft and the tapered hole has a chamfered inlet edge. The tapered second end of shaft may further comprise a chamfer at the base of the taper.

[0016] In a particular embodiment the fastener comprises the fastener body for attachment to the closure; the pivotal shaft extending through said fastener body, said pivotal shaft having the first end and the second end wherein the first end is located on the first side of the fastener body and the second end is located on the second side of the fastener body such that, in use it extends therefrom in a direction away from the closure; and the handle. The first end is provided with the drive means configured to drive one or more latches to secure said closure, and the second end is provided with the taper for receiving the handle thereon. The handle has the tapered hole therein for receiving said second end of the shaft and the internal shape of the tapered hole conforms to the external shape of the taper on the second end of

the pivotal shaft and the tapered hole has the chamfered inlet edge.

[0017] In another embodiment the fastener comprises the fastener body for attachment to the closure; the pivotal shaft extending through said fastener body, said pivotal shaft having the first end and the second end wherein the first end is located on the first side of the fastener body and the second end is located on the second side of the fastener body such that, in use it extends therefrom in a direction away from the closure; and the handle. The first end is provided with the drive means configured to drive one or more latches to secure said closure, and the second end is provided with the taper for receiving the handle thereon. The handle has the tapered hole therein for receiving said second end of the shaft and the tapered hole has the chamfered inlet edge and the shaft is provided with the corresponding chamfer at the base of the shaft.

[0018] The handle can be provided with a keyway formed on the interior surface of its tapered hole.

[0019] The handle has a threaded hole therein between an outer surface thereof and the tapered hole, and wherein a screw is provided in said threaded hole. The screw may be a grub screw.

[0020] The fastener of the invention may comprise a handle having a tapered hole therein for receiving said second end of the shaft, wherein the taper of the shaft is provided with a recess therein for receiving a further fastener; and wherein the handle has a threaded hole therein between an outer surface thereof and the tapered hole, and wherein a screw is provided in said threaded hole so that it extends through said tapered hole into said recess.

[0021] The threaded hole in the handle may be offset from, and overlap, the recess. In one arrangement the screw may be provided with a tapered end and the threaded hole and the recess may be arranged such that tightening the screw through the threaded hole into the recess pulls the shaft into the tapered hole.

[0022] The fastener may further comprise latches and an espagnolette fastening device and said latches are driven by the handle via the espagnolette device.

[0023] Specific examples will be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a traditional fastener as known in the art;

Figure 2 shows a known fastener used with espagnolette type fittings;

Figure 3 shows an exploded view of a first embodiment of the fastener in accordance with the present invention;

Figure 4 shows an assembled view of the first embodiment of the fastener in accordance with the

present invention;

Figure 5 shows a second embodiment of the invention;

Figure 6 shows the rear of the second embodiment of the invention;

Figure 7 shows a perspective view of a third embodiment of the invention;

Figure 8 shows an exploded cross section of the third embodiment of the invention; and

Figure 9 shows an assembled cross section of the invention.

[0024] Referring to Figure 1 a traditional type window fastener 2 commonly used with metal framed windows is shown. The fastener 2 has a base plate 4 by which it is attached to the window by screws via screw holes 6. A post 8 extends from the base plate 4 and a handle 10 is connected to the end of the post 8 by peening 12 the end of the post 8 so that it fastens to the post 8. The handle 10 has a latch 14 extending therefrom which interacts with a second part of the latch (not shown) that is located on the window frame so as to secure the window relative to the window frame.

[0025] Figure 2 shows a traditional type fastener for use with an espagnolette type fitting 100, for example as used in uPVC type windows. The handle 102 has an shaft 104 that is permanently attached hereto, for example by shrink fitting, expansion fitting, or push fitting, although other known fitting methods will be apparent to the skilled person, and which extends through a base plate 112 and which has a shaped end 106 that can drive an espagnolette type fitting. The handle 102 is retained in the fitting by means of a circlip 108. Alternatively a retaining ring washer can be push fitted onto the shaped end 106 to retain the handle on the base plate 112. The fitting is attached to the frame of a window during manufacture by screws (not shown) which pass through the attachment holes 110.

[0026] Referring to Figures 3 and 4 a fastener 20 of the present invention is shown.

[0027] The fastener 20 has a body 22 for attachment to the closure part of, for example, a window or door. A shaft 24 extends through the body 22 and is retained therein by a circlip 26 that fixes in a groove 28 of the shaft. In this way the shaft 24 is free to rotate in the plate 22. When fixed in place the shaft 24 passes through the body 22 so that it extends on both sides thereof.

[0028] One end of the shaft 24 is shaped in a substantially square shape 30 so that it may be received in a latch fitting, for example in a drive mechanism of an espagnolette type fitting, such that its rotation secures the closure, e.g. window, in a closed position. It will be appreciated that although depicted and describe as sub-

stantially square shaped, the end 30 of the shaft may have any shape suitable for driving in a rotary motion

[0029] The other end of the shaft is provided with a taper 32 on which is received a handle 34. The taper is a machine taper, and may be a Morse taper. The handle 34 has a corresponding internal taper 36 so that when placed on the shaft the two tapers retain the handle 34 in place on the shaft. In this way, turning the handle will turn the shaft and activate the espagnolette or other latch type mechanism to allow the closure to be opened or closed.

[0030] As shown in the figures, to improve the strength of the turning motion that can be applied, the taper 32 may be provided with a key 38 that locates in a corresponding slot 40 in the interior of the tapered hole 36 in the handle 34.

[0031] In addition, or alternatively, the tapered end of the shaft 24 may be provided with a recess 42 therein and the handle 34 may be provided with at hole 44 so that a further fastener 46 can be passed from through the hole 44 to locate in the recess 42. In this manner the handle 34 is prevented from pulling away from the shaft 24. Either the recess 42 or the hole 44 may be provided with a thread and the further fastener 46 may, for example, be a grub screw that fastens to the thread.

[0032] The fastener 20 may also include an espagnolette fastening device having a drive hole in which the end 30 of the shaft is received so as to operate the latches of the espagnolette type device.

[0033] Referring to Figures 5 and 6 an alternative embodiment of the invention is shown. This embodiment is similar to that shown in Figure 3 and as can be seen the handle attachment by means of the machine taper is the same.

[0034] Instead of the circlip 26 that retains the handle of Figure 3, in this embodiment this is replaced with a cog 50. The cog 50 not only retains the shaft 24, which is shorter in this embodiment, in the handle body 22.

[0035] As can be seen from Figure 6 the shaft 23 is shorter and as such does not extend beyond the body 22. Instead the cog 50 acts on a drive arm 52 to slide between two positions. In use the drive arm 52 will act on an espagnolette type fixture in the window frame to operate remote latches.

[0036] Referring to Figures 7 to 9 an arrangement of the invention is shown. In this arrangement the shaft 24a has a taper 32a at one end thereof which is substantially square in cross section, as opposed to circular in the previous arrangement. The handle 34a has a square tapered hole 40a therein for receiving the tapered end 32a of the shaft 24a. A chamfer 54 is provided around the opening of the tapered hole 40a, and a corresponding chamfer 56 is provided at the base of the tapered section 32a of the shaft 24a. By base of the tapered section it is meant that the chamfer on the pivotal shaft 24a is provided at the end of the taper that is towards the first end of the pivotal shaft, as depicted in the drawings, i.e. the widest section of the taper. In this manner, as the taper

32a is inserted in the tapered hole 40a, as the tapered section approaches a fully inserted position the chamfer 56 on the pivotal shaft 24a will come into contact with the chamfer 54 on the inlet edge of the tapered hole 40 and continued movement will centre the shaft in the hole as the chamfers 54, 56 slide over one another.

[0037] As can be seen, in common with the previous arrangement the handle 34a is provided with a threaded hole 44 extending therethrough to open into the tapered hole 40a, in which a screw 46 is received. The tapered end 32a of the shaft 24 is provided with a recess 42 therein into which the screw 46 can be tightened to retain the handle on the shaft.

[0038] As can be seen from Figure 9, when the tapered shaft 32a is inserted into the tapered hole 40a the threaded hole 44 and the recess 42 are overlapping and slightly misaligned, with the recess 42 in the tapered shaft 32a being offset from the threaded hole 44 in a direction towards the chamfered opening 54 of the tapered hole 40a. In this manner, as the screw 46 is tightened into the recess it will pull the tapered shaft 32a into the tapered hole 40a to securely retain the handle on the shaft. To assist in the tightening of the shaft into the hole 40a, the screw 46 is provided with a pointed end 58 such that as the screw 46 is tightened the side of the pointed end 58 bears upon the recess 42 as it moves thereinto.

[0039] As can be seen from the illustrations the remainder of the operation and assembly of the fastener is as described herein above. Although shown in Figures 7 and 8 with a cog 50 for operating an espagnolette type mechanism it will be appreciated that the longer square shaft and circlip as shown in Figure 3 could also be used with the square tapered arrangement of Figures 7 to 9.

Claims

1. A fastener (20) for a closure comprising:

a fastener body (22) for, in use, attachment to said closure;
a pivotal shaft (24, 24a) extending through said fastener body (22), said pivotal shaft (24, 24a) having a first end and a second end wherein the first end is located on a first side of the fastener body (22) and the second end is located on a second side of the fastener body (22) such that, in use the second end extends therefrom in a direction away from the closure; and
a handle (34, 34a) comprising a tapered hole (36, 40a) therein for receiving said second end of the shaft; wherein

the first end is provided with a drive means configured to drive one or more latches to secure said closure;
the second end is provided with a taper (32, 32a) for

receiving a handle (34, 34a) thereon; and the handle (34, 34a) has a threaded hole (44) therein and extending between an outer surface thereof and the tapered hole (36, 40a); and wherein a screw (46) is provided in said threaded hole (44).

2. The fastener according to claim 1 wherein said handle (34, 34a) has a tapered hole (36, 40a) therein for receiving said second end of the shaft, and wherein the internal shape of the tapered hole (36, 40a) conforms to the external shape of the taper (32, 32a) on the second end of the pivotal shaft (24, 24a) and the tapered hole (36, 40a) has a chamfered inlet edge.
3. The fastener according to claim 1 wherein said handle (34, 34a) has a tapered hole (36, 40a) therein for receiving said second end of the shaft and the tapered hole (36, 40a) has a chamfered inlet edge and the shaft has a corresponding chamfer at the base of the shaft.
4. The fastener according to claim 2 wherein the tapered second end of shaft (24, 24a) is provided with a chamfer at the base of the taper (32, 32a).
5. The fastener according to any one of claims 2 to 4 wherein said tapered hole (36, 40a) comprises a blind tapered hole.
6. The fastener according to any one of claims 2 to 5 wherein said handle (34, 34a) comprises a keyway (40) formed on the interior surface of said tapered hole (36, 40a).
7. The fastener according to any one of the preceding claims wherein the taper (32, 32a) is provided with a recess (42) therein for receiving said screw (46).
8. The fastener according to claim 7 wherein the threaded hole (44) in the handle (34, 34a) is offset from, and overlaps, the recess (42).
9. The fastener according to claim 8 wherein the screw (46) is provided with a tapered end and wherein the threaded hole (44) and the recess (42) are arranged such that tightening the screw (46) through the threaded hole (44) into the recess (42) pulls the taper (32, 32a) into the tapered hole (36, 40a).
10. The fastener according to any preceding claim wherein the taper (32, 32a) retains the handle (34, 34a) on the shaft.
11. The fastener according to any preceding claim wherein the shaft is provided with at least one key (38) extending therefrom.
12. The fastener according to any preceding claim

wherein the taper (32, 32a) has flat sides or curved sides.

13. The fastener according to any preceding claim further comprising an espagnolette fastening device and said latches are driven by the handle via the espagnolette device.

10 Patentansprüche

1. Befestigungsvorrichtung (20) für einen Verschluss, umfassend:

einen Befestigungskörper (22), zur Befestigung, im Betrieb, des Verschlusses;
eine Schwenkwelle (24, 24a), welche sich durch den Befestigungskörper (22) erstreckt, wobei die Schwenkwelle (24, 24a) ein erstes Ende und ein zweites Ende aufweist, wobei das erste Ende auf einer ersten Seite des Befestigungskörpers (22) und das zweite Ende auf einer zweiten Seite des Befestigungskörpers (22) angeordnet ist, sodass, im Betrieb, das zweite Ende sich davon in einer vom Verschluss wegzeigenden Richtung erstreckt; und
einen Griff (34, 34a), umfassend ein konisches Loch (36, 40a) darin, zum Aufnehmen des zweiten Endes der Welle; wobei

das erste Ende mit einem Antriebsmittel versehen ist, welches konfiguriert ist, um eine oder mehrere Verriegelungen anzutreiben, um den Verschluss zu befestigen;
das zweite Ende mit einer Verjüngung (32, 32a) versehen ist, um einen Griff (34, 34a) darauf aufzunehmen; und
der Griff (34, 34a) ein Gewindeloch (44) darin aufweist und sich zwischen einer Außenfläche davon und dem konischen Loch (36, 40a) erstreckt; und wobei
eine Schraube (46) im Gewindeloch (44) bereitgestellt ist.

2. Befestigungsvorrichtung nach Anspruch 1, wobei der Griff (34, 34a) ein konisches Loch (36, 40a) darin zum Aufnehmen des zweiten Endes der Welle aufweist und wobei die innere Form des konischen Lochs (36, 40a) sich an die äußere Form der Verjüngung (32, 32a) auf dem zweiten Ende der Schwenkwelle (24, 24a) anschmiegt und das konische Loch (36, 40a) eine abgeschrägte Einlaufkante aufweist.
3. Befestigungsvorrichtung nach Anspruch 1, wobei der Griff (34, 34a) ein konisches Loch (36, 40a) darin zum Aufnehmen des zweiten Endes der Welle aufweist und das konische Loch (36, 40a) eine abge-

schrägte Einlaufkante aufweist und die Welle eine entsprechende Abschrägung an der Basis der Welle aufweist.

4. Befestigungsvorrichtung nach Anspruch 2, wobei das verjüngte zweite Ende der Welle (24, 24a) mit einer Abschrägung an der Basis der Verjüngung (32, 32a) versehen ist. 5
5. Befestigungsvorrichtung nach einem der Ansprüche 2 bis 4, wobei das konische Loch (36, 40a) ein konisches Sackloch umfasst. 10
6. Befestigungsvorrichtung nach einem der Ansprüche 2 bis 5, wobei der Griff (34, 34a) eine Nut (40) umfasst, welche auf der Innenfläche des konischen Lochs (36, 40a) gebildet ist. 15
7. Befestigungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei die Verjüngung (32, 32a) mit einer Ausnehmung (42) darin versehen ist, um die Schraube (46) aufzunehmen. 20
8. Befestigungsvorrichtung nach Anspruch 7, wobei das Gewindeloch (44) im Griff (34, 34a) von der Ausnehmung (42) versetzt ist und diese überlappt. 25
9. Befestigungsvorrichtung nach Anspruch 8, wobei die Schraube (46) mit einem verjüngten Ende versehen ist und wobei das Gewindeloch (44) und die Ausnehmung (42) so angeordnet sind, dass durch das Spannen der Schraube (46) durch das Gewindeloch (44) in der Ausnehmung (42), die Verjüngung (32, 32a) in das konische Loch (36, 40a) eingezogen wird. 30
10. Befestigungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei die Verjüngung (32, 32a) den Griff (34, 34a) auf der Welle hält. 40
11. Befestigungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei die Welle mit zumindest einer Nut (38) versehen ist, welche sich davon erstreckt. 45
12. Befestigungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei die Verjüngung (32, 32a) flache Seiten oder gekrümmte Seiten aufweist. 50
13. Befestigungsvorrichtung nach einem der vorhergehenden Ansprüche, ferner umfassend eine Treibstangenbefestigungsvorrichtung und wobei die Verriegelungen durch den Griff über die Treibstangenvorrichtung angetrieben werden. 55

Revendications

1. Élément de fixation (20) pour une fermeture, comprenant :

un corps de fixation (22) destiné à être fixé en service sur ladite fermeture ;
un arbre pivotant (24, 24a) s'étendant à travers ledit corps de fixation (22), ledit arbre pivotant (24, 24a) comportant une première extrémité et une deuxième extrémité, la première extrémité étant située sur un premier côté du corps de fixation (22) et la deuxième extrémité étant située sur un deuxième côté du corps de fixation (22), de sorte qu'en service, la deuxième extrémité s'étend à partir de celui-ci dans une direction allant à l'écart de la fermeture ; et
une poignée (34, 34a) comprenant un trou conique (36, 40a) pour recevoir ladite deuxième extrémité de l'arbre ; dans lequel :

la première extrémité comporte un moyen d'entraînement configuré pour entraîner un ou plusieurs verrous pour fixer ladite fermeture, la deuxième extrémité comportant une conicité (32, 32a) pour recevoir une poignée (34, 34a), la poignée (34, 34a) comportant un trou fileté (44) et s'étendant entre sa surface externe et le trou conique (36, 40a) ; et dans lequel :

une vis (46) est agencée dans ledit trou fileté (44).

2. Élément de fixation selon la revendication 1, dans lequel ladite poignée (34, 34a) comporte un trou conique (36, 40a) pour recevoir ladite deuxième extrémité de l'arbre, et dans lequel la forme interne du trou conique (36, 40a) est adaptée à la forme externe de la conicité (32, 32a) sur la deuxième extrémité de l'arbre pivotant (24, 24a), le trou conique (36, 40a) comportant un bord d'entrée chanfreiné. 35
3. Élément de fixation selon la revendication 1 dans lequel ladite poignée (34, 34a) comporte un trou conique (36, 40a) pour recevoir ladite deuxième extrémité de l'arbre, le trou conique (36, 40a) comportant un bord d'entrée chanfreiné et l'arbre comportant un chanfrein correspondant au niveau de la base de l'arbre. 40
4. Élément de fixation selon la revendication 2, dans lequel la deuxième extrémité conique de l'arbre (24, 24a) comporte un chanfrein au niveau de la base de la conicité (32, 32a). 45
5. Élément de fixation selon l'une quelconque des revendications 2 à 4, dans lequel ledit trou conique 55

(36, 40a) comprend un trou conique borgne.

6. Élément de fixation selon l'une quelconque des revendications 2 à 5, dans lequel ladite poignée (34, 34a) comprend une rainure de clavette (40) formée sur la surface interne dudit trou conique (36, 40a). 5
7. Élément de fixation selon l'une quelconque des revendications précédentes, dans lequel la conicité (32, 32a) comporte un évidement (42) pour recevoir ladite vis (46). 10
8. Élément de fixation selon la revendication 7, dans lequel le trou fileté (44) dans la poignée (34, 34a) est décalé de l'évidement (42) et chevauche celui-ci. 15
9. Élément de fixation selon la revendication 8, dans lequel la vis (46) comporte une extrémité conique et dans lequel le trou fileté (44) et l'évidement (42) sont agencés de sorte que le serrage de la vis (46) à travers le trou fileté (44) dans l'évidement (42) entraîne la conicité (32, 32a) dans le trou conique (36, 40a). 20
10. Élément de fixation selon l'une quelconque des revendications précédentes, dans lequel la conicité (32, 32a) retient la poignée (34, 34a) sur l'arbre. 25
11. Élément de fixation selon l'une quelconque des revendications précédentes, dans lequel l'arbre comporte au moins une clé (38) s'étendant à partir de celui-ci. 30
12. Élément de fixation selon l'une quelconque des revendications précédentes, dans lequel la conicité (32, 32a) comporte des côtés plats ou des côtés courbés. 35
13. Élément de fixation selon l'un quelconque des revendications précédentes, comprenant en outre un dispositif de fixation à espagnolette, lesdits verrous étant entraînés par la poignée par l'intermédiaire du dispositif à espagnolette. 40

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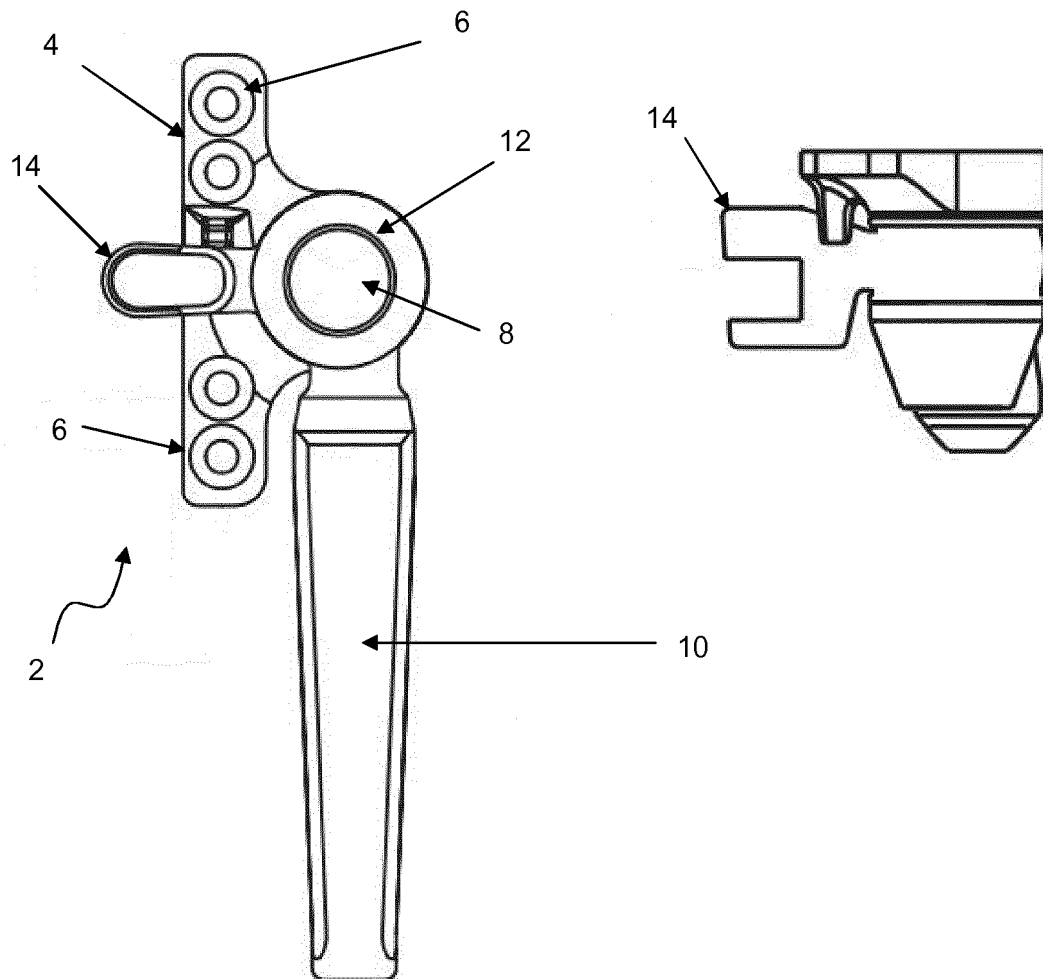
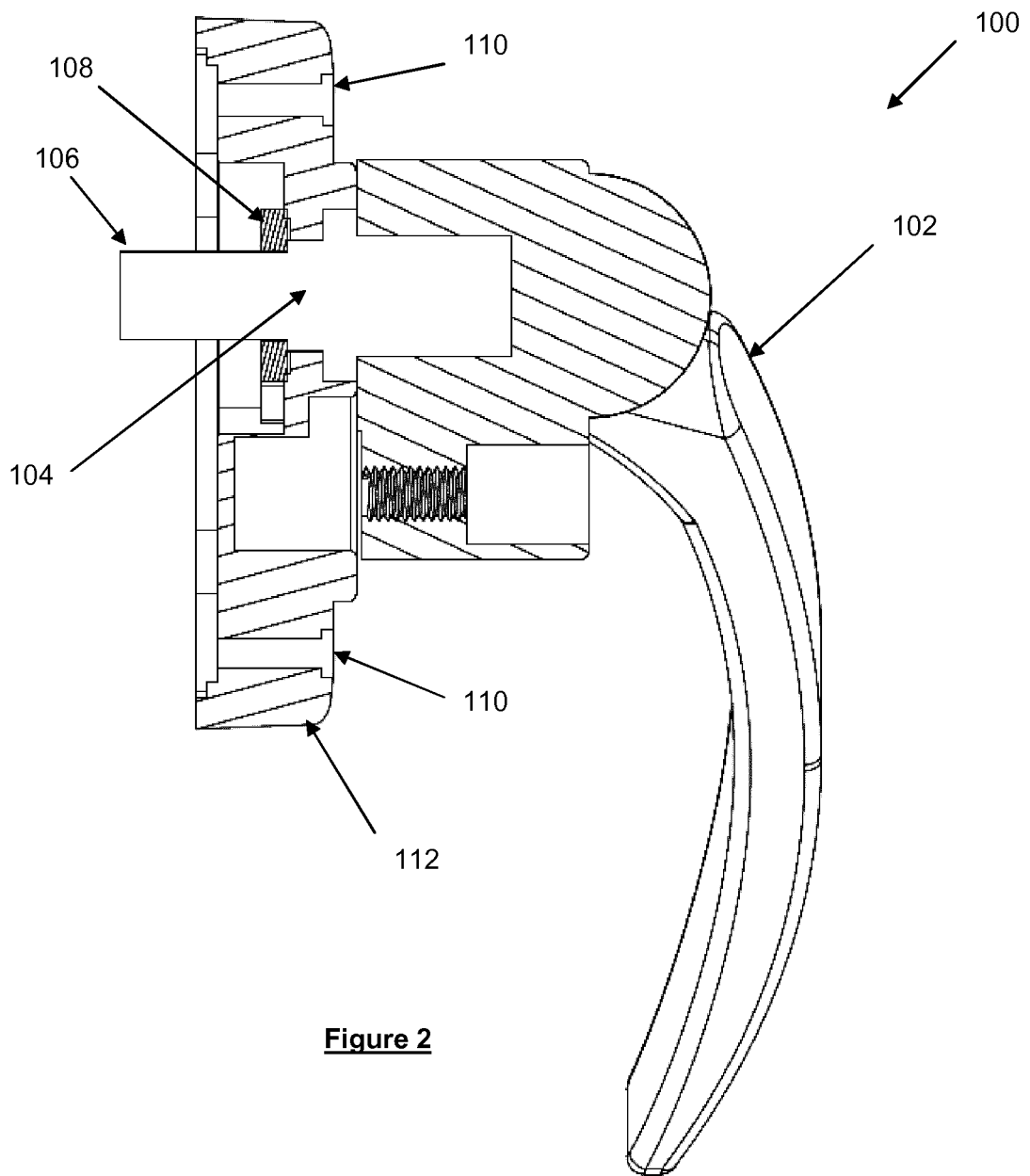


Figure 1



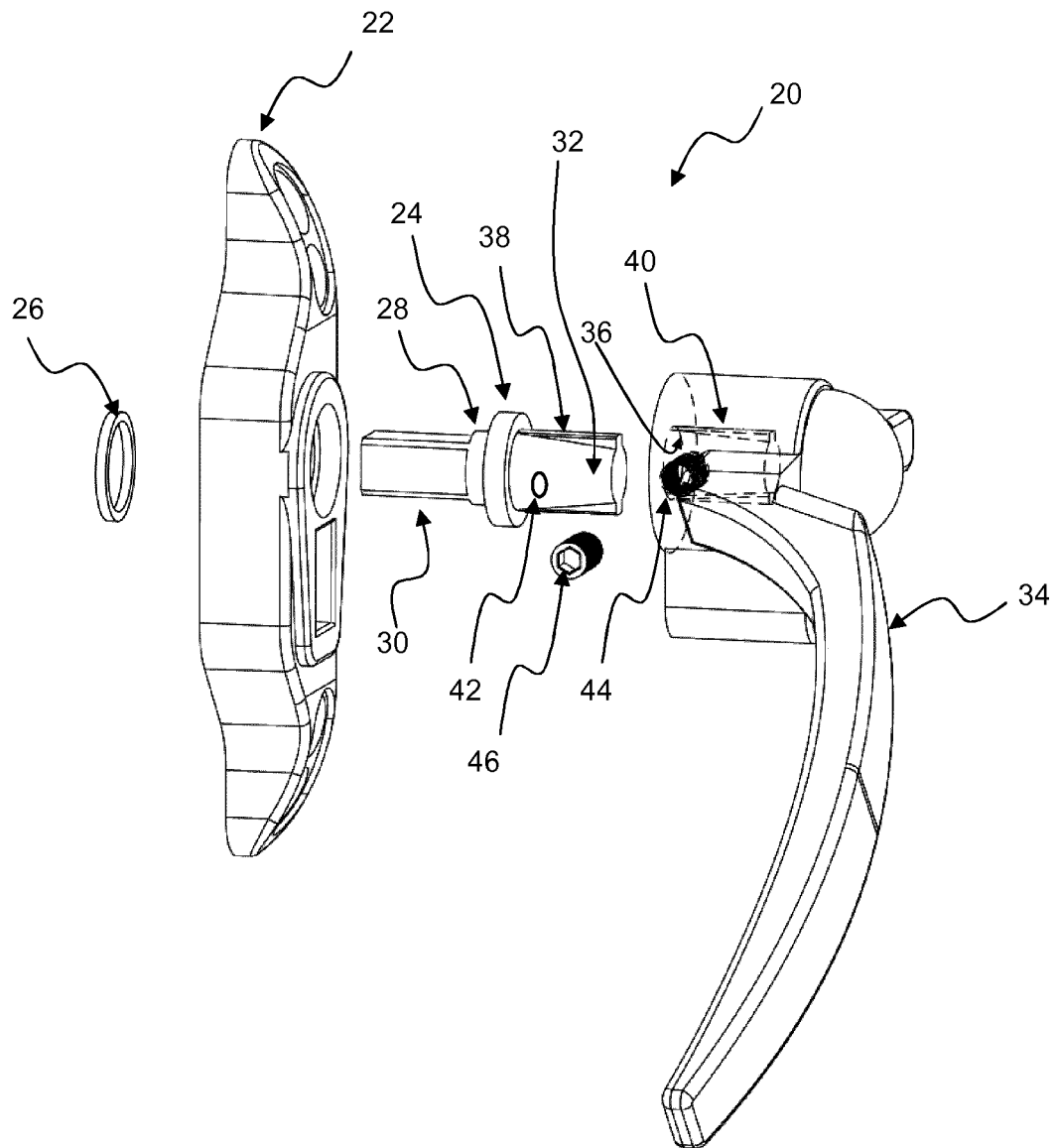


Figure 3

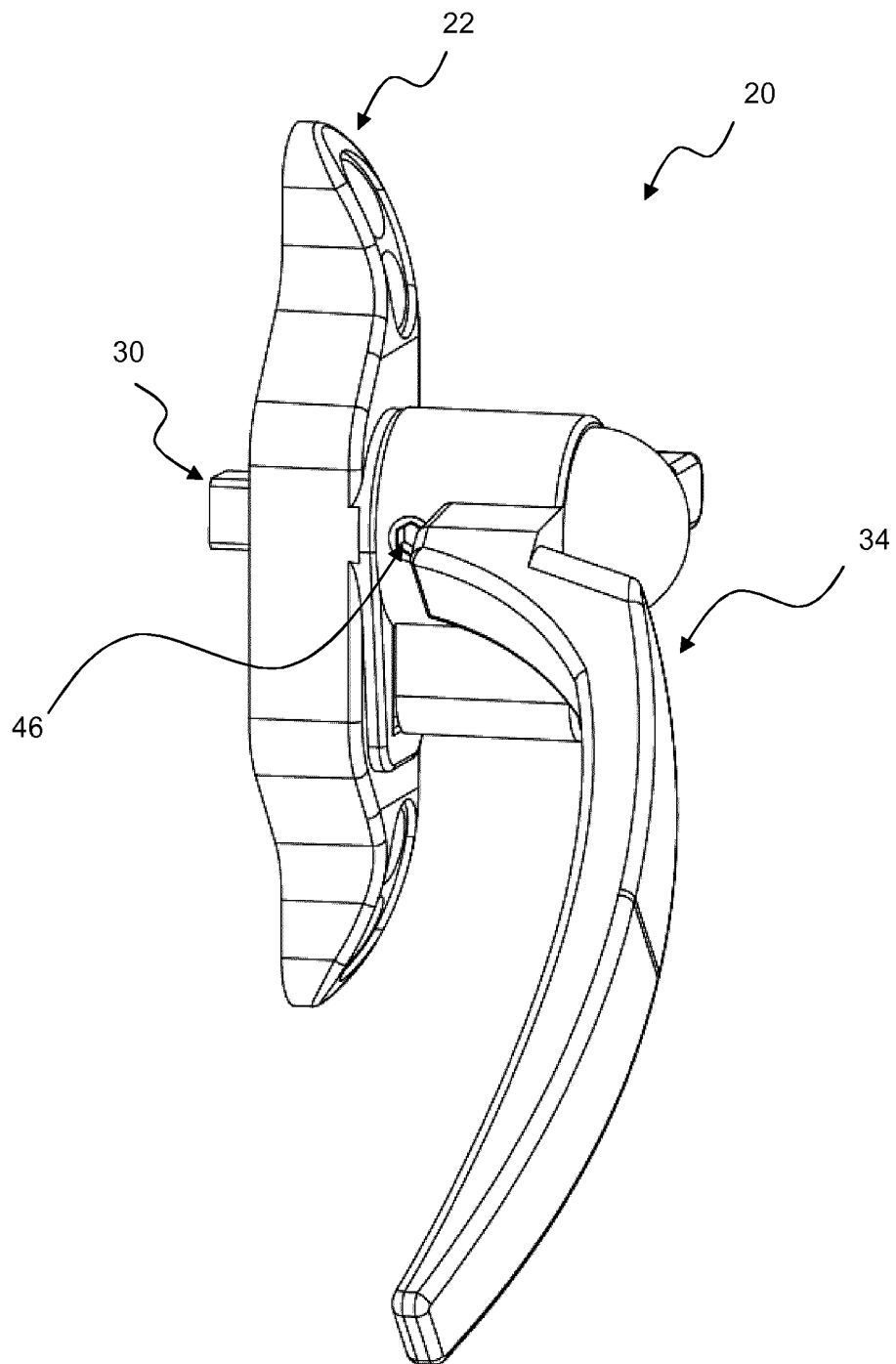


Figure 4

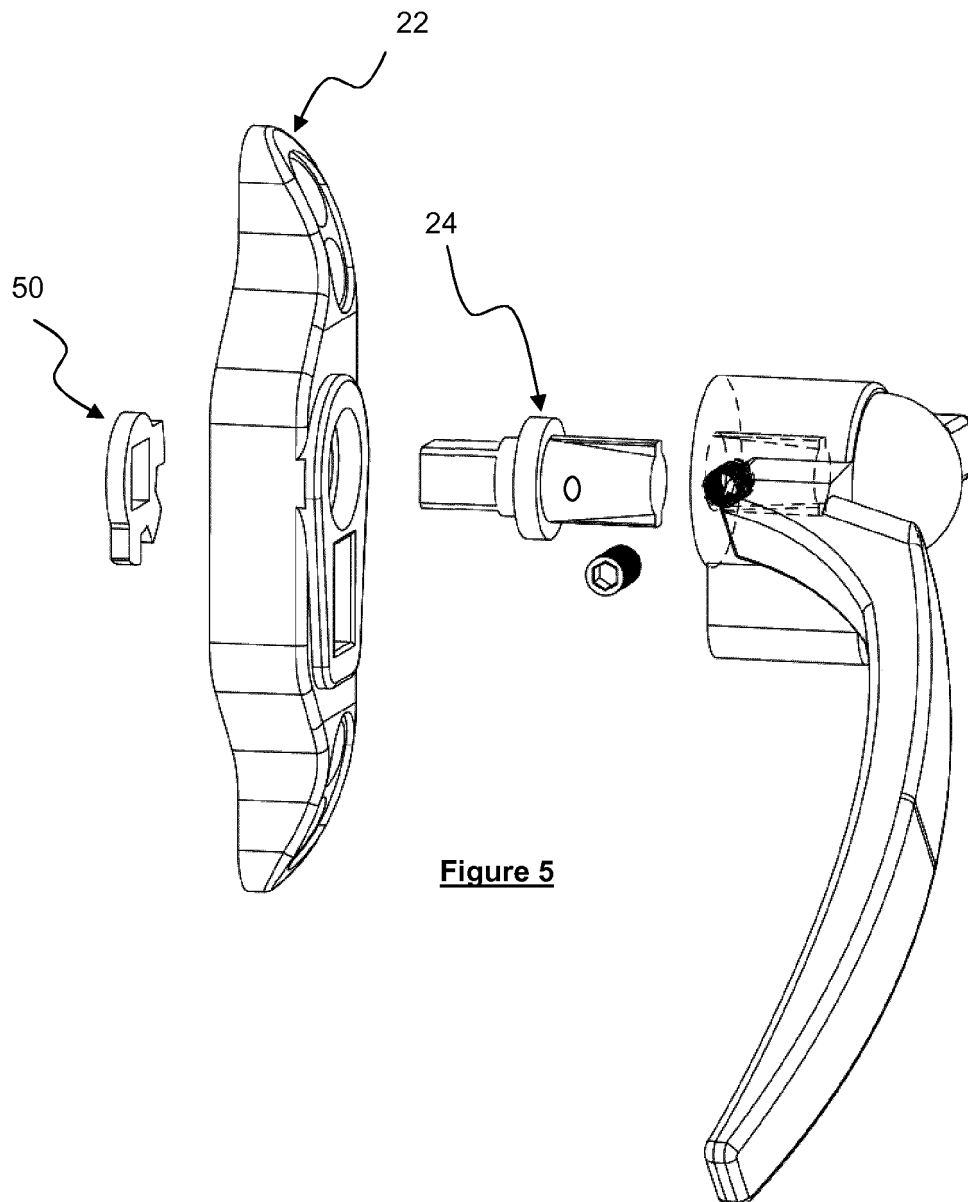


Figure 5

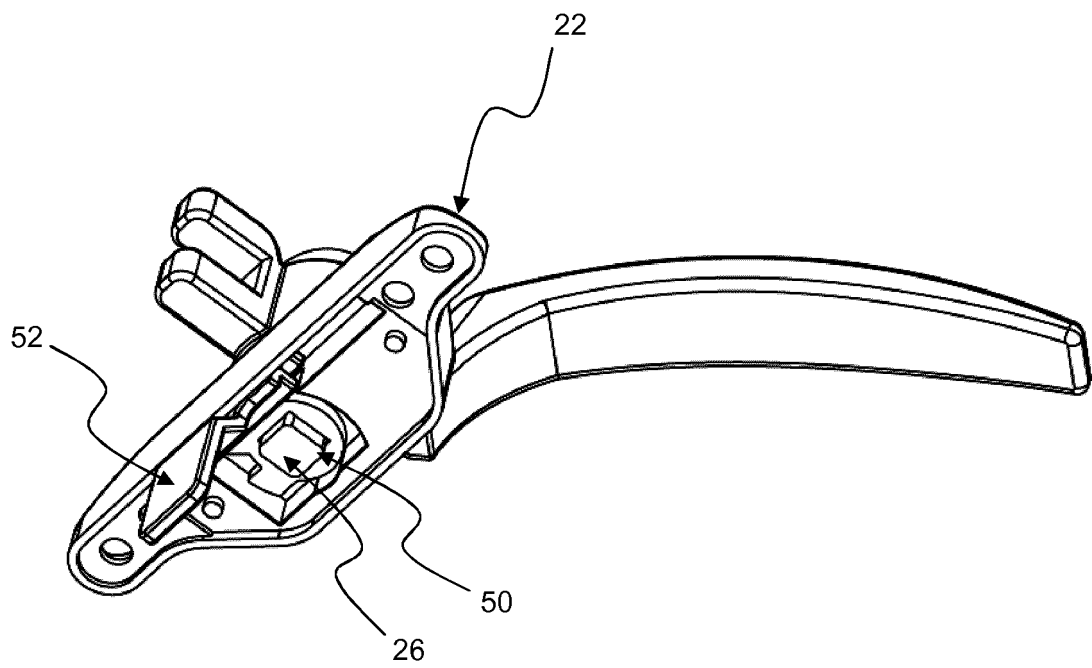


Figure 6

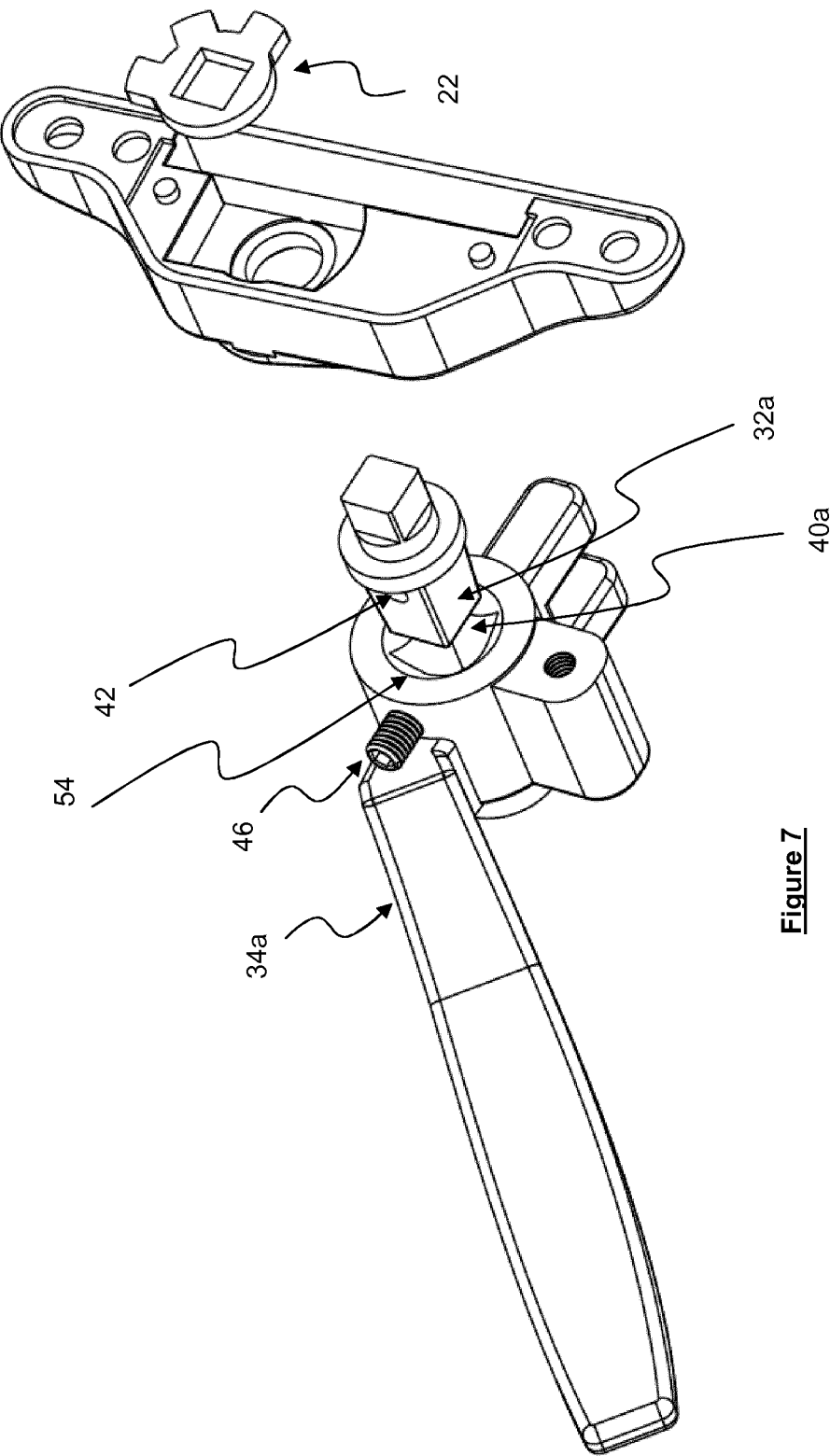


Figure 7

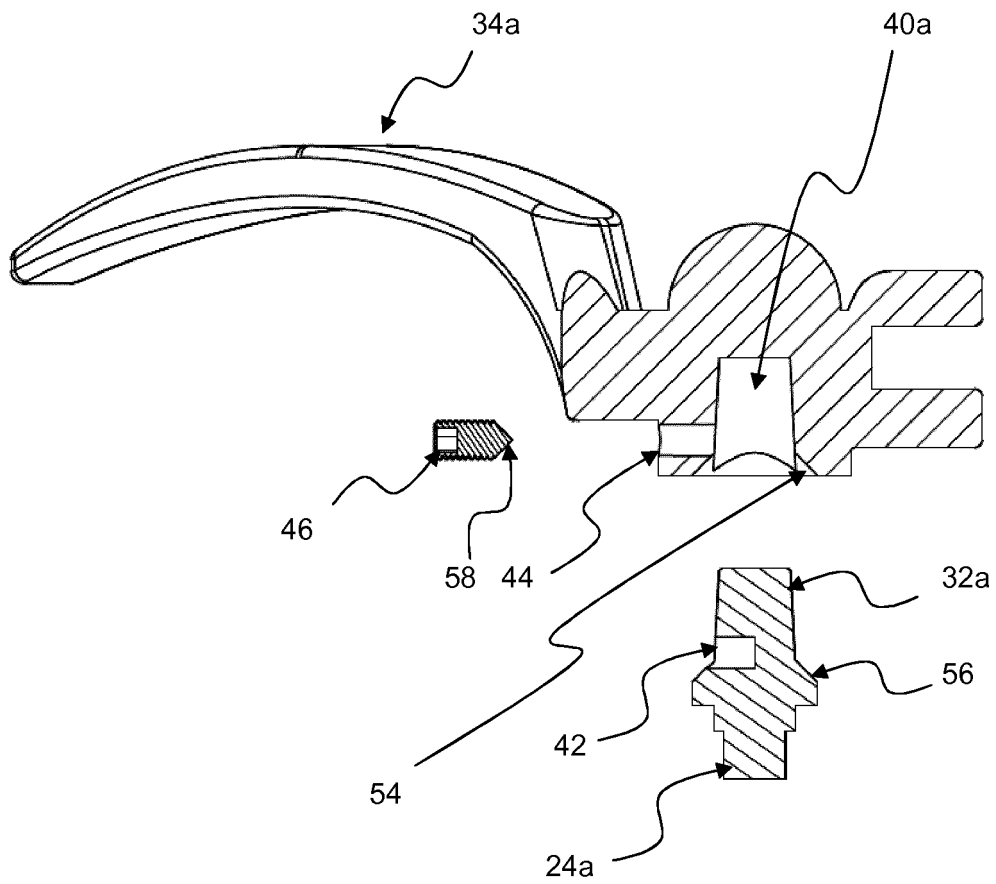
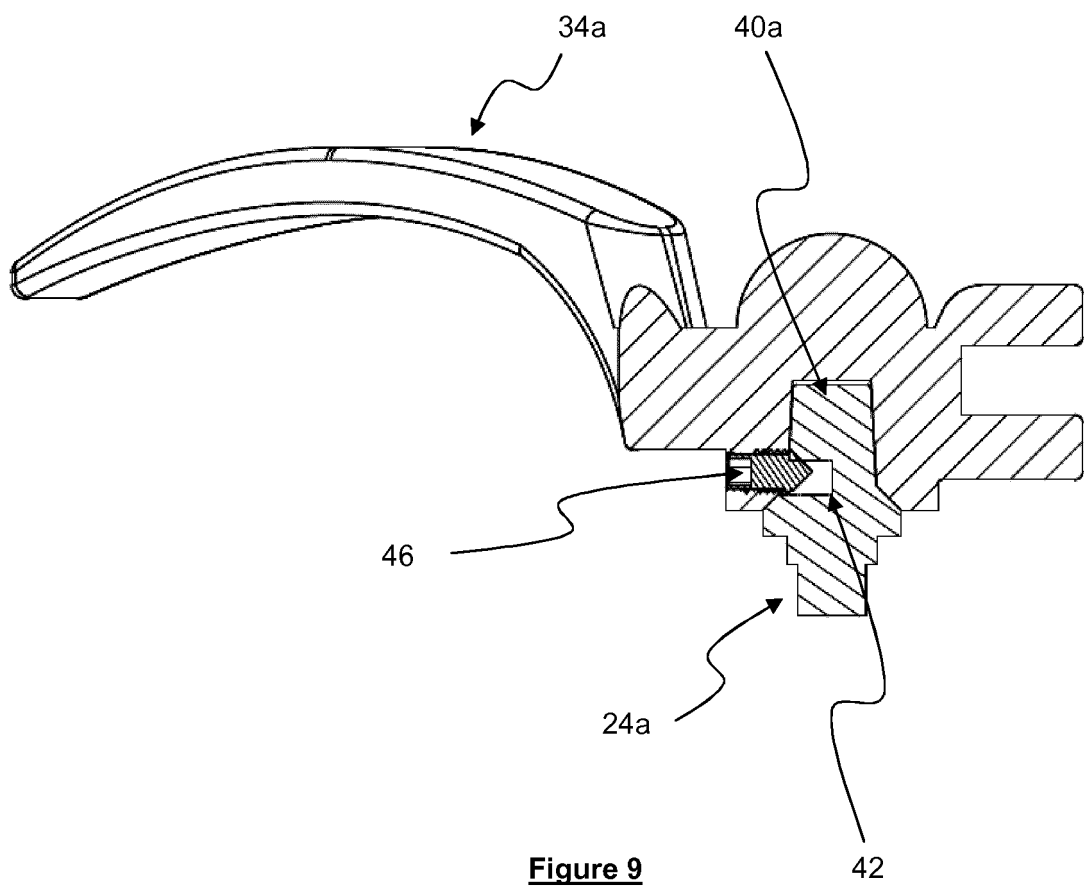


Figure 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 222439 [0005]
- GB 00028 A [0005]
- US 68956 A [0005]
- EP 1321604 A [0005]
- US 20050156441 A [0005]
- CN 202380809 [0005]