(12) STANDARD PATENT (11) Application No. **AU 2010227017 B2**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Spindle Retention System

(51) International Patent Classification(s)
E05B 3/04 (2006.01)

(21) Application No: **2010227017** (22) Date of Filing: **2010.10.07**

(30) Priority Data

(31) Number	(32) Date	(33) Country
2009904873	**2009.10.07**	**AU**

(43) Publication Date: **2011.04.21**
(43) Publication Journal Date: **2011.04.21**
(44) Accepted Journal Date: **2014.11.06**

(71) Applicant(s)
Assa Abloy Australia Pty Limited

(72) Inventor(s)
Forrestal, David Peter;Terei, Andrew John Teatuario

(74) Agent / Attorney
Cullens Patent and Trade Mark Attorneys, Level 32 239 George Street, Brisbane, QLD, 4000

(56) Related Art
GB 102856 A
JP 2000129965 A
US 2008/0111384 A1
DE 10250960 A1
DE 3248053 A1
WO 1997/003267 A2

2010227017 07 Oct 2010

Abstract

A spindle retention system for a rotatable handle mechanism including an elongate spindle having at least one opening therein, a spindle housing associated with the rotatable handle and having a spindle aperture therein, a spindle retaining member having at least one extension wherein the spindle retaining member or the at least one extension is deformable to removeably locate the at least one extension within the at least one opening in the elongate spindle and attachment means to attach the spindle retaining member to the rotatable handle mechanism.

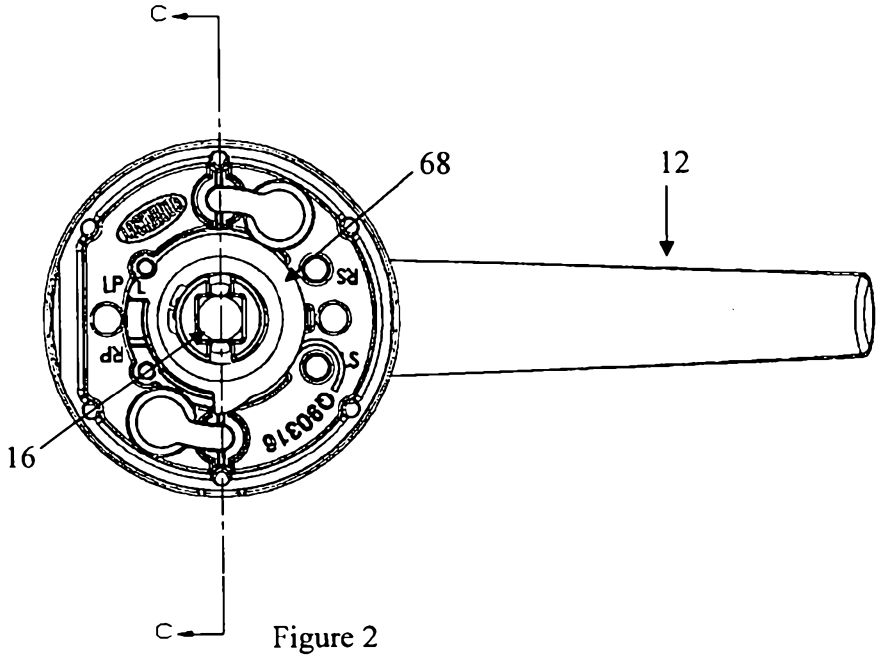


Figure 2

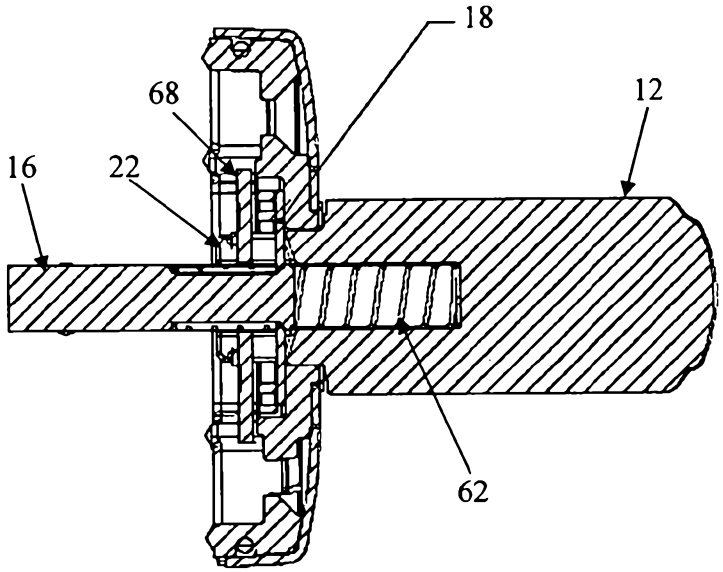


Figure 3

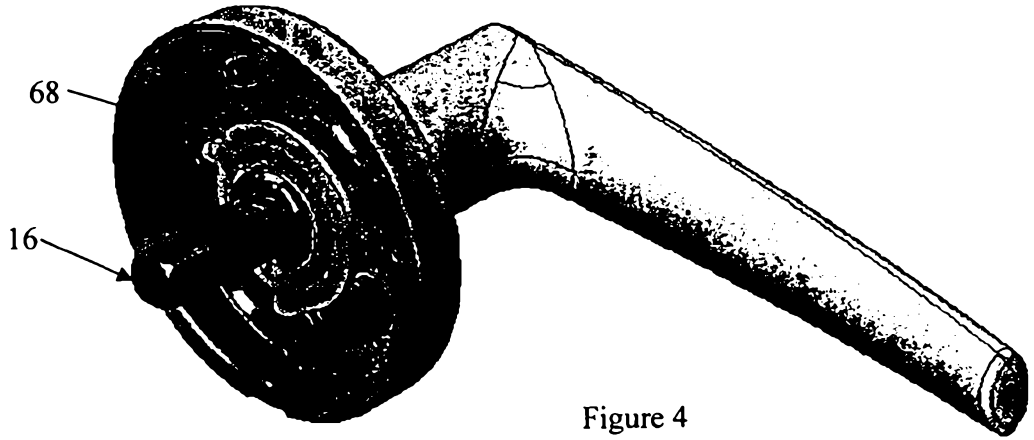


Figure 4

2010227017 07 Oct 2010

AUSTRALIA
Patents Act 1990

COMPLETE SPECIFICATION

Invention Title: Spindle Retention System

Applicant: Assa Abloy Australia Pty Ltd

The invention is described in the following statement.

2010227017 03 Oct 2014

TECHNICAL FIELD

The invention described herein relates generally to a door handle assembly and more particularly is concerned with a spindle retention mechanism which allows a spindle to be removeably secured to the door handle assembly, although the scope of the invention is not necessarily limited thereto.

BACKGROUND

In a typical door securing installation, a lock is fitted to the door from one end and a door handle assembly is fitted on each side of the door in proximity to the lock so that a spindle, which is engaged with the lock, can be used to transfer rotational movement from one of the handle assemblies to the lock. Although the spindle is an integral part required for the proper functioning of the securing installation, it often happens that the spindle is not secured to any component of the installation, for example either to one of the door handle assemblies or to the lock, so that the spindle can be misplaced during installation of the securing installation or when maintenance is carried out on the securing installation. This could delay finishing installing the securing installation or completing the maintenance on the securing installation.

It is common to have doors of different thicknesses depending upon the application of the door. Doors of different thicknesses require spindles of different effective lengths. Normally, a handle assembly will be provided with a spindle of a particular length. If the spindle is fixed to the handle in the conventional manner, it is cumbersome to remove and replace the spindle, should the spindle be of incorrect length for the thickness of the door.

SUMMARY OF THE INVENTION

It is an aim of the invention to provide a door lever assembly to which a spindle is removably secured which overcomes or ameliorates one or more of the disadvantages or problems described above, or which at least provides the consumer with a useful choice.

The present invention in a first form, resides broadly in a spindle retention system for a rotatable handle mechanism, the system including an elongate spindle having at least one opening therein, a spindle housing associated with the rotatable handle and having a spindle aperture therein, wherein the spindle aperture is operable to receive at least a portion of the

2010227017 03 Oct 2014

spindle in such a way that, when at least a portion of the spindle is received in the spindle aperture, the spindle can move in and out relative to the spindle aperture, a spindle retaining member having at least one extension wherein the spindle retaining member or the at least one extension is deformable to removeably locate at least one extension within at least one opening in the spindle, attachment means to attach the spindle retaining member relative to the rotatable handle, and biasing means operable, when the spindle is received in the spindle aperture, to bias the spindle outward relative to the spindle aperture but which also allows the spindle to move inward relative to the spindle aperture.

It is envisaged that the lever assembly spindle retaining member will be used as one of the components making up a lever handle assembly for a door or similar element which can be used to operate a lock or latch mounted on the door or the like. Suitably, the spindle retaining member may not only secure the spindle to the lever handle assembly but it may also do so in a manner allowing easy removal of the spindle.

The lever handle assembly may be fitted to any suitable closure or component which needs to be held in a particular position such as a door or a window. Furthermore, the spindle retention system is directed to maintaining a spindle engaged with the assembly so that, when the lever assembly is removed from a door to which the lever assembly is fitted, the spindle is removed with the lever assembly but also to allow the spindle to be easily removed from the lever handle assembly when required. This may be the case when the spindle needs to be swapped for a spindle of a different (e.g. greater) length. The association of the spindle retaining member with the spindle is such that, once the lever handle assembly has been removed from the door, the spindle can be detached from the lever assembly by simply pulling on the spindle. Similarly, a spindle may be attached to the lever handle assembly by insertion of the spindle into the spindle aperture and pressing.

The spindle retaining member may have any suitable shape and, in one example, is substantially planar and has a body which is disk-like and in the form of a washer. Typically the spindle retaining member will be annular with each extension extending inwardly towards the centre of the annulus.

The spindle retaining member may further include or may be shaped to include, one or more engagement formations, at least one of which may act as a stop formation. For example when the spindle retaining member is used in the lever assembly to prevent a handle of the

2010227017 03 Oct 2014

lever assembly being pivoted past a predetermined point, or a bearing surface against which a biasing member such as a torsion spring can act to bias the handle to a neutral position. Where provided, the engagement formations/portions will normally extend from either an outer side of the annulus or perpendicularly thereto. Normally however, these engagement formations will be provided on a separate drive washer.

The spindle aperture, when viewed in cross-section, may have any suitable shape to allow the spindle to be at least partially received into the aperture.

The spindle will have at least one opening therein. Normally, the spindle will be an elongate rod with a rectangular cross-section. It will therefore normally have four side faces and two end faces. Any cross-sectional shape may be used, however, although as the spindle is used to transmit rotation, therefore it will normally be non-circular.

At least one of the side faces of the spindle, and preferably each of a pair of opposed side faces, may have an opening, and most preferably a groove into which the at least one extension of the spindle retaining member can extend. Openings may be provided on all of the side faces.

By providing an elongate opening or groove, the spindle may be transversely movable relative to the spindle retaining member to vary the distance of travel or maximum protrusion of the spindle from the handle assembly. Normally, biasing means in the form of, for example, a compression spring will be mounted in the spindle aperture adjacent the handle. This compression spring will typically bias the spindle outwardly, away from the handle.

The spindle aperture may be suitably profiled to correspond with an outer shape of the spindle so that once the spindle is inserted, the spindle has little or no lateral play inside the spindle aperture.

In a particularly preferred embodiment, the spindle retaining member includes at least one extension, each of which is adapted to be received at least partly inside a respective groove extending partially along the spindle. The number of extensions will correspond to the number of openings in the spindle.

The spindle retaining member, or the at least one extension, may be manufactured from any suitable material which will allow movement or deformation of the extensions

2010227017 03 Oct 2014

relative to the rest of the spindle retaining member without resulting in the at least one extension member breaking off or detatching from the body. For example, the spindle retaining member may be manufactured from a suitable metal such as spring steel. However, it may be difficult to deform a short length of a metal forming the extension(s) so that a less rigid material such as a plastic material may be used. The spindle retaining member may be manufactured of a composite material in order to provide the requisite deformability but also a degree of rigidity to prevent accidental but not determined removal of the spindle.

In use, the at least one extension of the spindle retaining member will be deformed while the spindle is pushed into the spindle aperture, to allow the spindle to pass. However, the at least one extension moves from the deformed position to a normal position (i.e. the position and orientation which the at least one extension occupied before the spindle was inserted into the spindle aperture) once the at least one extension is aligned with the groove in the spindle. Conversely, the spindle can be detached from the spindle retaining member and the handle assembly by pulling on the spindle which causes the at least one extension to move along the groove until the extension engages with an end of the groove, and further determined movement results in the at least one extension being deformed allowing passage of the spindle from the spindle aperture.

The at least one extension can be formed in any appropriate way such as by integrally forming the at least one extension from the material used to manufacture the remainder of the spindle retaining member.

Alternatively, in another example of forming the at least one extension, a spigot may be mounted to the spindle retaining member for movement between an extended position and a retracted position so that the movement of the spigot to the retracted position allows the spindle to pass into, and out of, the spindle aperture.

In a further example of construction, the at least one extension may be in the form of a ball or other member which is mounted for resilient movement between the extended and retracted positions and biased into an extended position.

The at least one extension, when viewed in cross-section, can be any suitable shape such as square, rectangular, oval, or the like. Typically the cross-sectional profile of at least the free end of at least one extension will correspond to a cross-sectional profile of the

2010227017 03 Oct 2014

corresponding groove in the spindle so that the closely related cross-sectional profiles of the at least one extension and the groove allow for the spindle retaining member to closely retain the spindle.

The present invention in a second form, resides broadly in a lever assembly which includes a handle having a pivot end and a spindle aperture in or near the pivot end, a spindle, a spindle retaining member, and biasing means, wherein the spindle is connectable relative to the handle so that, in use, pivotal movement of the handle about the pivot end causes rotational movement of the spindle, the spindle retaining member is mountable relative to the handle at or near the pivot end, one or both of the spindle retaining member and the spindle has at least one interengaging retaining formation operable such that, when the spindle retaining member is mounted relative to the handle, the spindle can be releasably secured relative to the handle by forcing the spindle into the spindle aperture, which requires deformation of at least a part of one or more of the interengaging retaining formations, so that the retaining formations interengage, the biasing means is operable, when the spindle is in the spindle aperture, to bias the spindle outward relative to the spindle aperture but also allows the spindle to move inward relative to the spindle aperture, and wherein the spindle can be detached from the spindle retaining member by pulling on the spindle so that the retaining formations are disengaged.

One advantage of certain embodiments of the present invention is that the spindle can be longitudinally moved relative to the spindle retaining member a distance equal to the length of the groove(s) without causing detachment of the spindle from the spindle retaining member. The spindle will also be biased outwardly but be capable of limited movement to adjust to a range of door thicknesses.

A rose or similar may be provided in association with the handle to contain a plurality of components such as an inner, mounting casing to which is secured an outer, decorative casing or rose.

Normally, the pivot end of the handle is shaped to allow an end of the spindle to be fitted to the pivot end so that pivotal movement of the handle about the pivot end causes rotational movement of the spindle about a longitudinal axis of the spindle. In one example, the pivot end of the handle may have a spindle aperture therein which has a shape, when viewed in cross-section, which corresponds to an outer profile of the spindle when viewed in

2010227017 03 Oct 2014

cross-section. The pivot end of the handle is usually inserted through an opening in a rose. The inner surface of the rose may be provided with mounting portions to attach various components to the handle mechanism. In an alternative embodiment, an insert may be provided with is shaped to be received adjacent the inner surface of the decorative rose and having the mounting portions.

The insert will normally have one or more mounting openings to allow the insert to be mounted to a door or similar. The insert will also preferably have at least one extension to provide bearing surfaces for the return spring or similar to bias the handle into a closed condition. Still further, the insert may also have at least one mounting means to attach the spindle retaining member to the insert. This may be through a snap-fit mechanism.

Guide portions may be provided to guide movement of any of the portions. Typically, the return spring for the handle is sandwiched between the spindle retaining member and the drive plate or washer.

The lever handle assembly may further include a biasing member or return spring which is fitted to the pivot end of the handle. The pivot end of the handle will typically be configured as a pair of extension portions with at least one slot separating the pair. An inner surface of the pivot end is shaped as discussed above to closely receive the spindle.

In this example, the insert will include one or more support formations which anchor the biasing member at one end at least. An opposed, second end of the biasing member is preferably registered with one of the slots formed in the pivot end so that the biasing member biases the handle to a neutral position in which the handle is typically in a substantially horizontal position.

The spindle retaining member may be secured to the pivot end of the handle using any suitable technique. In one example of the invention, the lever assembly spindle retaining member is secured to the pivot end by using a circlip or the like which is fitted to the pivot end adjacent to the mouth of the socket of the pivot end.

It may be possible to reduce the ease with which the respective extension members can be moved along each elongate groove by changing the length of each extension member so that the extent with which the free end of the respective extension member extends into the opening in the spindle once the spindle retaining member is fitted to the pivot end. Thus, by

2010227017 03 Oct 2014

varying the degree with which the respective free ends project into the cavity, a frictional force may be established between each free end and a base of a respective elongate groove thereby increasing the force which has to be applied to the spindle before longitudinal movement is caused in the spindle.

Alternatively, without altering the length of each retaining members, a depth of each elongate groove can be varied to achieve the same result (i.e. increasing or decreasing the frictional force established between the retaining members and the elongate groove as by varying the length of each retaining member).

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more readily understood and put into practice, one or more preferred embodiments thereof will now be described, by way of example only, with reference to the accompanying drawings.

Figure 1 is a perspective exploded view of a lever assembly according to a preferred embodiment of the present invention.

Figure 2 is a front view of the lever assembly illustrated in Figure 1 in the assembled condition.

Figure 3 is a sectional view of the lever assembly illustrated in Figure 2 along line C-C.

Figure 4 is a perspective view of the lever assembly illustrated in Figure 1 in the assembled condition.

Figure 5 is a partially exploded perspective view of a lever assembly illustrated in Figure 1 with the spindle retention mechanism in place.

Figure 6 is a perspective view showing of a spindle retaining member according to a preferred embodiment of the invention.

Figure 7 is a perspective view of a spindle according to the invention used in the lever assembly of Figure 1.

DETAILED DESCRIPTION OF THE DRAWINGS

2010227017 03 Oct 2014

Figure 1 of the accompanying representations illustrates a lever handle assembly 10 according to a preferred embodiment of the invention. The lever assembly includes a handle 12, a rose insert 14, a spindle 16 and a spindle retaining member 18.

The handle 12 has a pivot end 22 about which the handle can be rotated and with which the handle is mounted to the rose insert 14. The portion used to mount the handle 12 relative to the door or the like consists of an inner mounting insert 14, which typically is used to mount the handle assembly to a door, and an outer, decorative casing or rose 26 which is secured to the insert 14. It should be noted that the rose 11 can consist of only one part and the embodiment used is only an example and should not be seen as limiting.

The pivot end 22 is formed with a socket 28 formed from a pair of opposed members and a spindle aperture 32. The spindle aperture 32is suitably profiled to correspond with an outer profile of the spindle 16 and is dimensioned so that the spindle 16 can be inserted into the spindle aperture 32 with a snug fit so that the spindle 16 has little or no play once fitted to the pivot end 22. The socket 28 has two cutout portions or slots 38.

Referring in particular to Figure 6, the preferred spindle retaining member 18 has an annular body 44 which is substantially planar. An aperture 48 is formed through the body. The aperture 48 is suitably profiled to accommodate the outer profile of the pivot end 22 of the handle 12. In this instance, the aperture 48 is substantially cylindrical.

The body further has two extension members 56 which extend into the aperture 48 from diametrically opposed positions from the body. Each extension member has a free end 58 which is positioned relative to the other free end so that a predetermined distance or gap 60 is formed between the respective free ends. The particular relevance of the predetermined distance or gap 60 will become evident hereinafter.

The spindle 16 is shown in greater detail in Figure 7. The outer profile of the spindle is substantially square. The spindle 16 further has two retaining formations in the form of an elongate groove 70 each of which extends along part of a length of the spindle on opposed sides thereof.

Each extension member 56 is deformable relative to the remainder of the body 44 so that the distance or gap 60 can be varied. This is typically required when the spindle 16 is inserted into the aperture 48 when the spindle is fitted to the pivot end 22 until the grooves 70

2010227017 03 Oct 2014

of the spindle 16 are aligned with the extension members 56. Due to the resilience of the extension members 56, the extension members move back to the neutral positions (i.e. a position at which each extension member is in substantial alignment with the body 44) once the free ends pass into the respective elongate groove 70. The spindle retaining member 18 thus secures the spindle to the handle assembly.

The pivot end 22 has a free end which extends through openings in the rose insert 14 and the rose 26. A biasing member 92 is fitted over the pivot end 22 in such a way so that a first hook portion 94, formed at one end of the biasing member, is registered with a slot 38 of the socket 28. A second hook formation 96 is engaged with a support formation 98 formed on the rose insert 14 so that the handle 12 is biased towards a neutral position at which the handle extends substantially horizontal to the ground (once the lever assembly is fitted to the door).

The spindle retaining member 18 is fitted over the free end of the socket 28 by registering an extension member 56 with a respective slot 38.

A retaining slot (obscured) extends around an outer surface of the socket 28 so that engagement of the circlip 104 with the retaining slot prevents detachment of the spindle retaining member 18 and the biasing member 92 and the drive plate 68 from the pivot end 22.

The spindle 16 is then pushed into the spindle aperture 32 and snap fits to the pivot end 22 by inserting the spindle into the spindle aperture 32 in such a way so that an elongate groove 70 faces a respective slot 38 of the socket 28. Forcing the spindle deeper into the spindle aperture 32 results in the extension members 56 being deformed so that the gap 60 between the free ends 58 is increased, allowing passage of the spindle.

At some point, the free ends pass over the respective elongate grooves 70 which allow the extension members 56 to move back to the neutral positions which are, for example, shown in Figure 6. The spindle is now secured relative to the handle 12 with a snap fit so that pivotal movement of the handle about the pivot 22 causes rotational movement of the spindle about a longitudinal axis.

The spindle 16, while engaged with the lever assembly spindle retaining member 18, is biased outwardly away from the handle 12 by a compression spring 62. The spindle can move longitudinally relative to the handle for a distance equal to the length of each groove 70. This makes it possible, for example, to vary the distance with which a second end of the

2010227017 03 Oct 2014

spindle projects from the lever assembly 10 in order that the lever handle assembly can be used on doors of different thicknesses within a range.

When the lever assembly 10 or component thereof needs to be replaced, detachment of the lever assembly from the door results in the spindle 16 remaining in association with the lever assembly. This reduces the likelihood that the spindle may be inadvertently misplaced or lost.

The spindle 16 can be detached from the lever assembly 10 by pulling on the spindle. This will cause the extension members 56 positioned inside the respective elongate grooves 70, to move along the length of the respective grooves until the extension members 56 deform relative to the body 44 so that the gap 60 between the free ends is increased thereby allowing the spindle 16 to pass between the free ends 58.

A drive plate 68 is also provided in the preferred lever handle assembly. The drive plate 68 is also annular and has locating extensions 66 extending inwardly. Importantly, the length of the locating extensions 66 is not equal to the length of the extensions 56 on the spindle retaining member 18. Whilst the extensions 56 on the spindle retaining member 18 are of sufficient length to extend into the grooves 70, the locating extensions 66 on the drive plate 68 are received into the slots 38 in the pivot end 22, but the free ends of the locating extensions 66 are adjacent the sides of the spindle when the spindle 16 is in position.

The drive plate 68 has engagement formations 126 which abut corresponding formations on the rose insert 14 when the handle 12 is pivoted. This prevents the handle 12 being pivoted past the predetermined position thereby preventing damage which may be caused to the components of the lever assembly or to the lock or latch.

In assembly, the spindle retaining member 18 is located on the pivot end 22 in the rose insert 14 and the biasing means (return spring 92) is sandwiched between the spindle retaining member 18 and the drive plate 68. A washer 64 is located between the drive plate 68 and a circlip used to secure the assembly to the pivot end 22. The compression spring 62 is received within the spindle aperture 32 before the spindle retaining member 18 is inserted. Extension members 56 of spindle retaining member 18 protruding into the spindle aperture prevent the compression spring 62 from moving past the spindle retaining member 18.

2010227017 03 Oct 2014

The invention provides a lever assembly which incorporates a spindle which can be used to transfer pivotal movement from a handle of the assembly to a lock or latch. The lever assembly further incorporates a mechanism which allows for the detachment of the spindle from the lever assembly relatively easily thereby freeing the spindle to be associated with a different handle of another lever assembly or to be replaced, if required.

The foregoing embodiments are illustrative only of the principles of the invention, and various modifications and changes will readily occur to those skilled in the art. The invention is capable of being practiced and carried out in various ways and in other embodiments. It is also to be understood that the terminology employed herein is for the purpose of description and should not be regarded as limiting.

The term "comprise" and variants of the term such as "comprises" or "comprising" are used herein to denote the inclusion of a stated integer or stated integers but not to exclude any other integer or any other integers, unless in the context or usage an exclusive interpretation of the term is required.

Any reference to publications cited in this specification is not an admission that the disclosures constitute common general knowledge in Australia.

2010227017 03 Oct 2014

The claims defining the invention are as follows:

1. A spindle retention system for a rotatable handle mechanism, the system including

an elongate spindle having at least one opening therein,

a spindle housing associated with the rotatable handle and having a spindle aperture therein, wherein the spindle aperture is operable to receive at least a portion of the spindle in such a way that, when at least a portion of the spindle is received in the spindle aperture, the spindle can move in and out relative to the spindle aperture,

a spindle retaining member having at least one extension wherein the spindle retaining member or the at least one extension is deformable to removeably locate at least one extension within at least one opening in the spindle,

attachment means to attach the spindle retaining member relative to the rotatable handle, and

biasing means operable, when the spindle is received in the spindle aperture, to bias the spindle outward relative to the spindle aperture but which also allows the spindle to move inward relative to the spindle aperture.

2. The spindle retention system as claimed in claim 1 wherein the spindle retaining member is substantially planar and has a body which is disk-like and in the form of a washer.

3. The spindle retention system as claimed in claim 1 or 2 wherein the spindle retaining member is annular and each extension extends inwardly towards the centre of the annulus.

4. The spindle retention system as claimed in any one of the preceding claims wherein the spindle retaining member further includes one or more engagement formations, at least one of which acts as a stop formation to prevent rotation of the handle past a predetermined point.

5. The spindle retention system as claimed in claim 4 with claim 4 dependent on claim 3 wherein the engagement formations extend from either an outer side of the annulus or perpendicularly thereto.

2010227017 03 Oct 2014

6. The spindle retention system as claimed in any one of claims 1 to 3 including a separate drive washer with one or more engagement formations, at least one of which acts as a stop formation to prevent rotation of the handle past a predetermined point.

7. The spindle retention system as claimed in any one of the preceding claims wherein the spindle is an elongate rod with a non-circular cross-sectional shape.

8. The spindle retention system as claimed in any one of the preceding claims wherein at least one side face of the spindle has an opening in the form of an elongate groove into which at least one extension of the spindle retaining member can extend.

9. The spindle retention system as claimed in claim 8 wherein an opening in the form of an elongate groove is provided on more than one side face of the spindle.

10. The spindle retention system as claimed in claim 8 or claim 9 wherein at least a free end of at least one extension corresponds in shape to a cross-sectional profile of the corresponding groove in the spindle so that the closely related cross-sectional profiles of the at least one extension and groove allow for the spindle retaining member to closely retain the spindle.

11. The spindle retention system as claimed in any one of the preceding claims wherein at least one said extension is integrally formed with the spindle retaining member.

12. The spindle retention system as claimed in any one of claims 1 to 9 wherein at least one extension includes a spigot mounted to the spindle retaining member for movement between an extended position and a retracted position so that the movement of the spigot to the retracted position allows the spindle to pass into, and out of, the spindle aperture.

13. The spindle retention system as claimed in any one of claims 1 to 9 wherein at least one extension is provided as a member which is mounted for resilient movement between extended and retracted positions and biased into the extended position.

14. A lever assembly which includes a handle having a pivot end and a spindle retention system according to any one of the preceding claims wherein the spindle can be detached from the spindle retaining member by pulling on the spindle so that the at least one extension is disengaged from the at least one opening in the spindle.

2010227017 03 Oct 2014

15. A lever assembly which includes

a handle having a pivot end and a spindle aperture in or near the pivot end,

a spindle,

a spindle retaining member, and

biasing means

wherein

the spindle is connectable relative to the handle so that, in use, pivotal movement of the handle about the pivot end causes rotational movement of the spindle,

the spindle retaining member is mountable relative to the handle at or near the pivot end,

one or both of the spindle retaining member and the spindle has at least one interengaging retaining formation operable such that, when the spindle retaining member is mounted relative to the handle, the spindle can be releasably secured relative to the handle by forcing the spindle into the spindle aperture, which requires deformation of at least a part of one or more of the interengaging retaining formations, so that the retaining formations interengage,

the biasing means is operable, when the spindle is in the spindle aperture, to bias the spindle outward relative to the spindle aperture but also allows the spindle to move inward relative to the spindle aperture,

and wherein the spindle can be detached from the spindle retaining member by pulling on the spindle so that the retaining formations are disengaged.

16. The lever assembly as claimed in claim 14 or 15 wherein

a rose or similar is provided in association with the handle,

an inner surface of the rose is provided with mounting portions to attach various components relative to the handle.

17. The lever assembly as claimed in either claim 14 or 15 wherein a rose or similar is provided in association with the handle and an insert is provided which is shaped to be

2010227017 03 Oct 2014

received adjacent an inner surface of the rose and which has mounting portions to attach various components relative to the handle.

18. A spindle retention system or lever assembly substantially as described herein with reference to the accompanying figures.

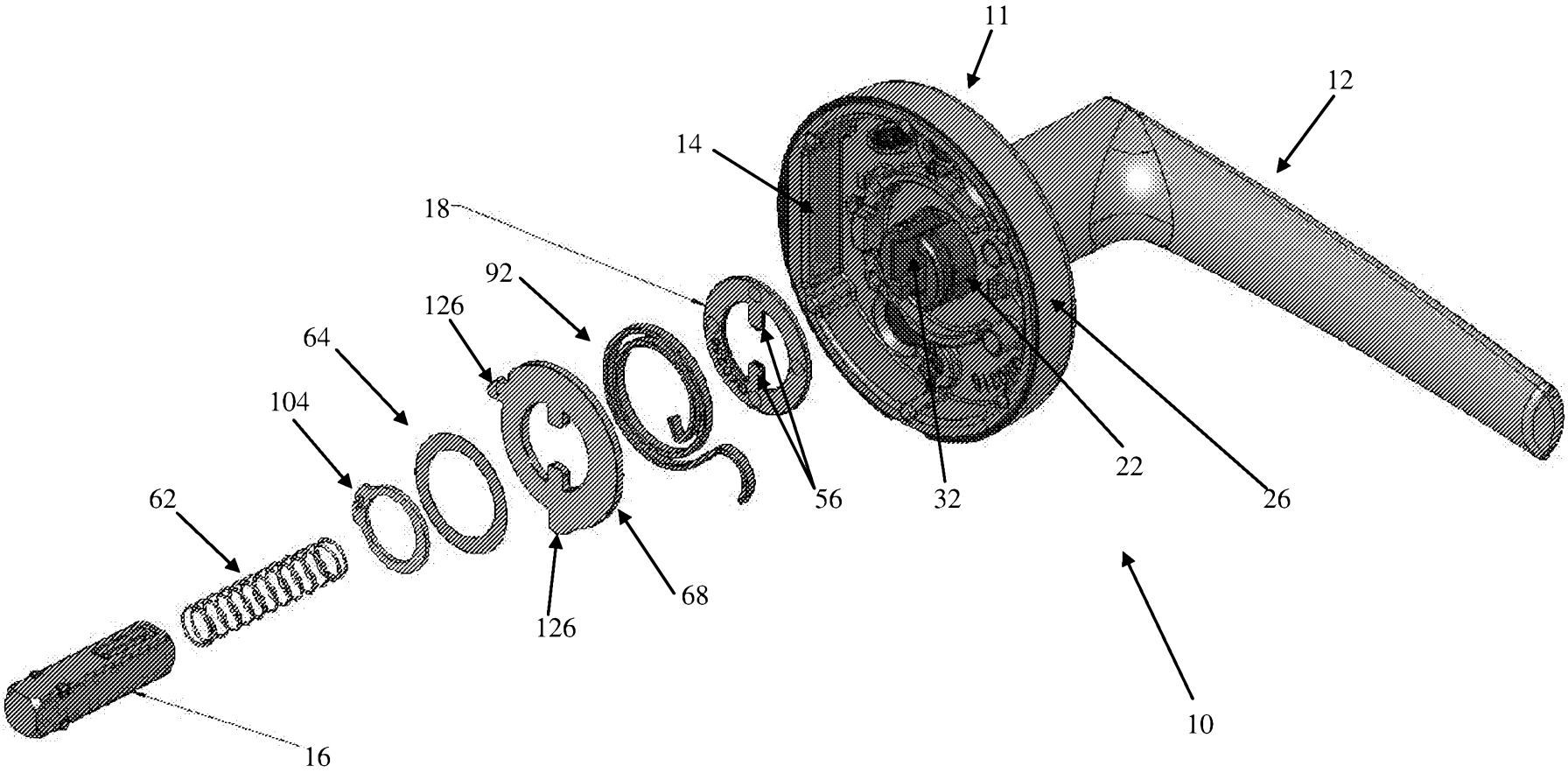


Figure 1

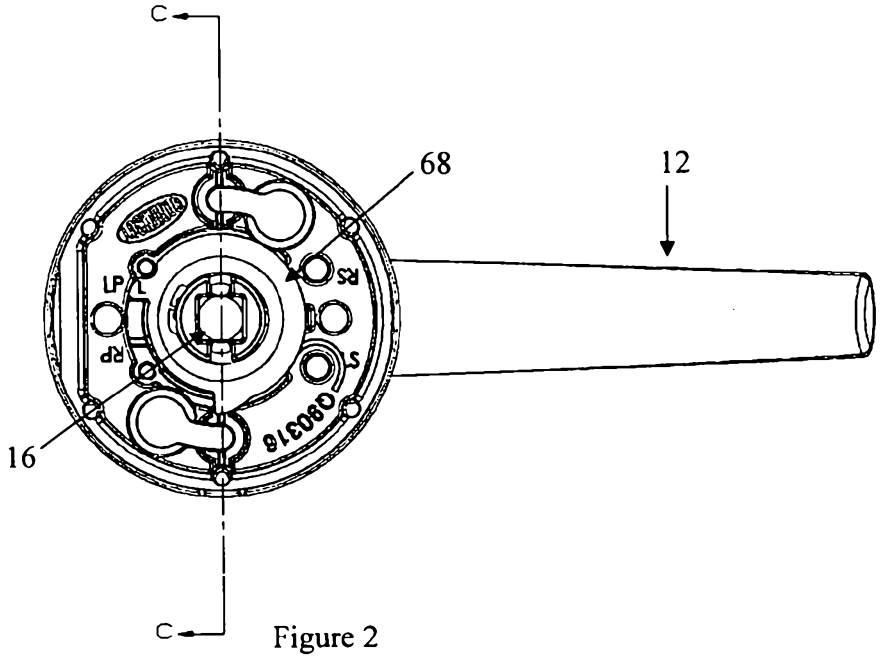


Figure 2

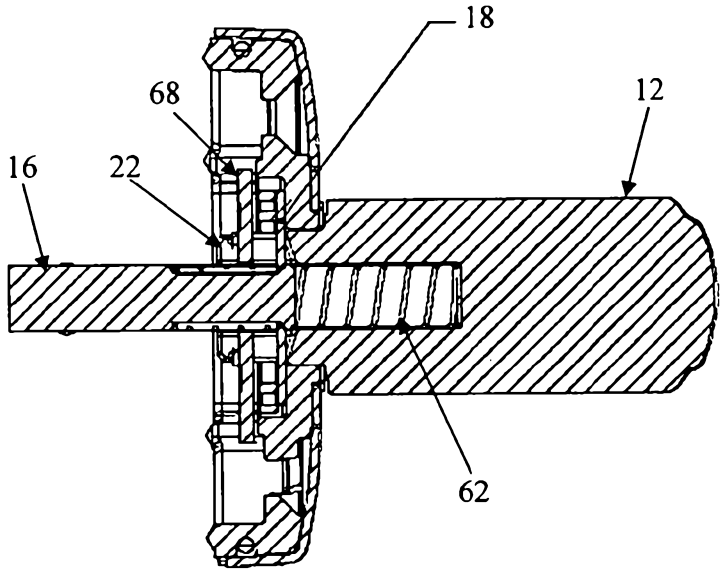


Figure 3

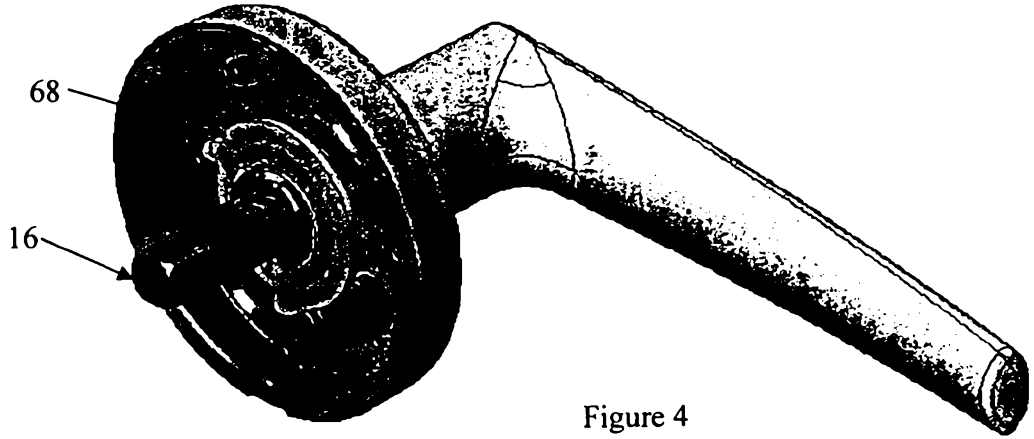


Figure 4

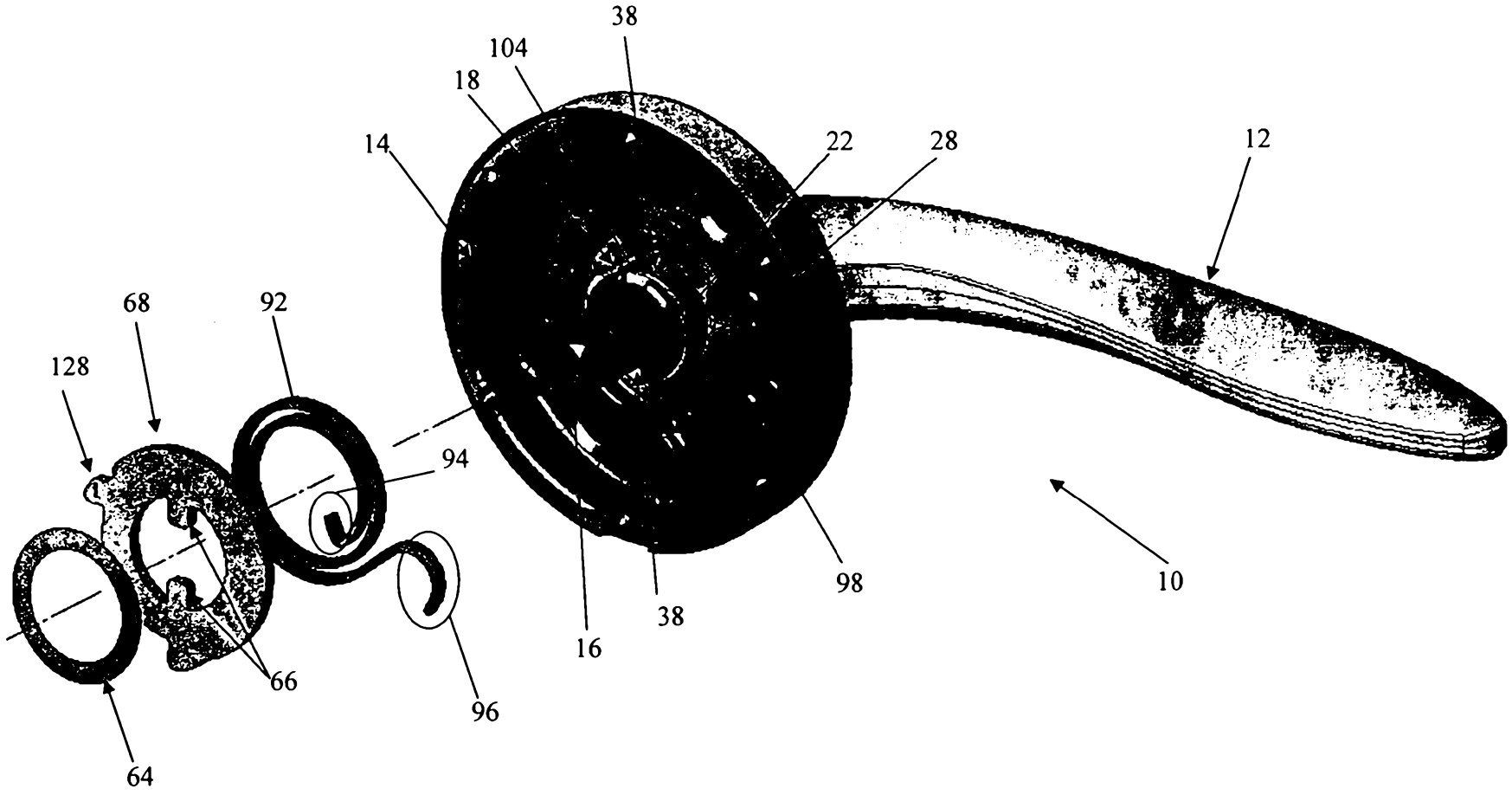


Figure 5

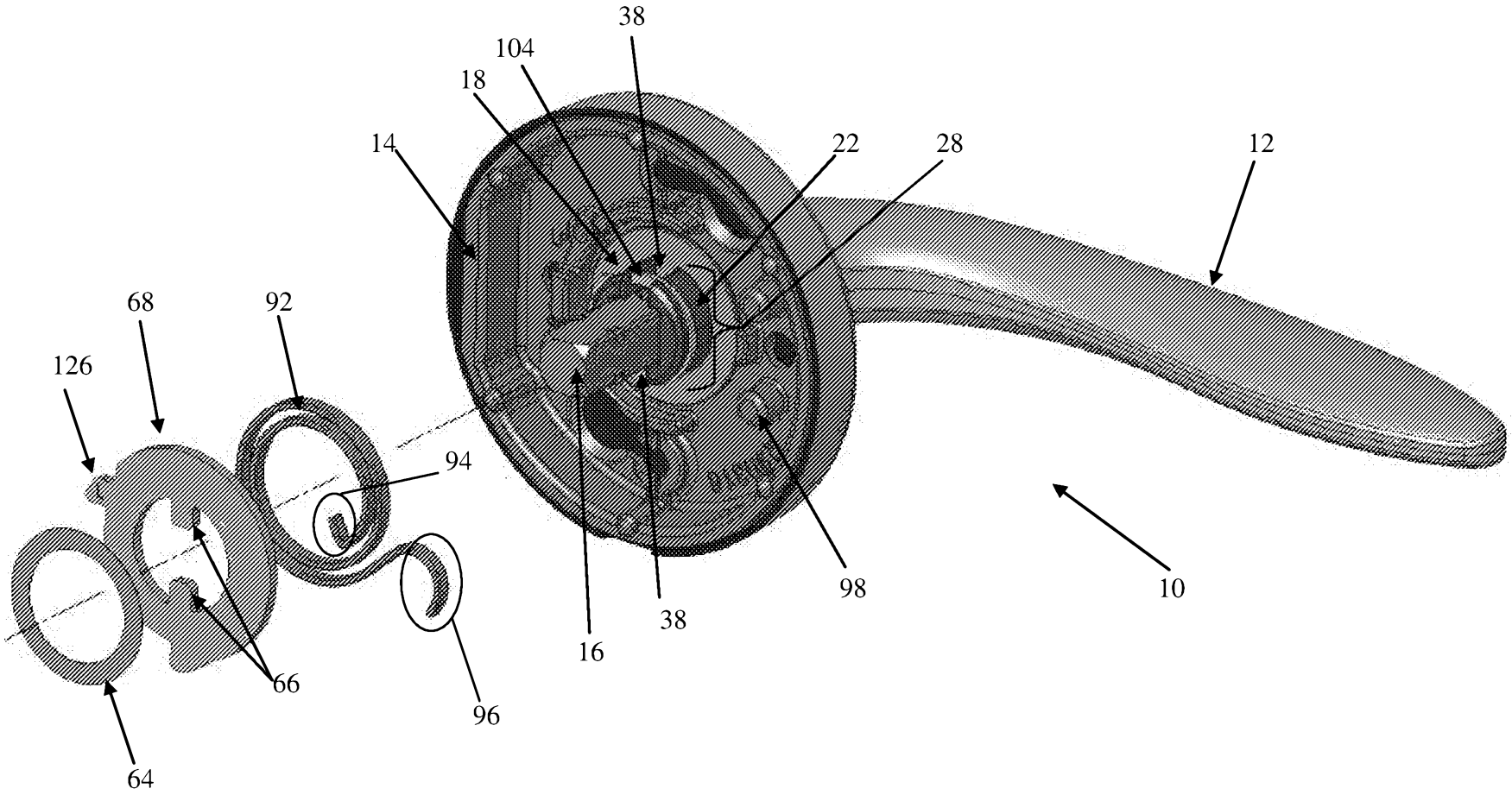


Figure 5

20102270017 07 Oct 2010

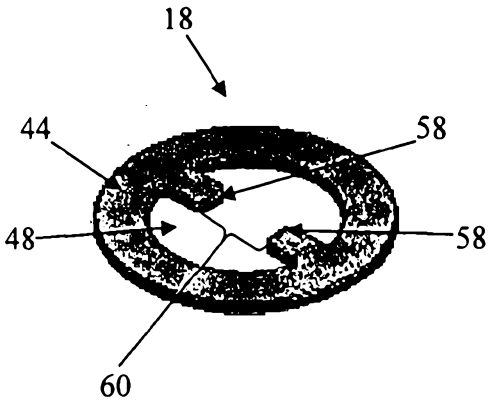


Figure 6

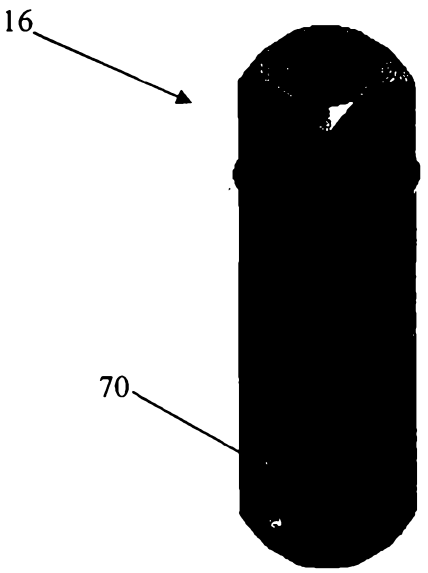


Figure 7