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[Continued on next page]

(54) Title: GUIDE ASSEMBLY

(57) Abstract: A guide assembly for a folding panel assembly or system, the guide assembly including a first body section for locating the assembly in a guide channel and a second body section for carrying a bolt that passes through a hinge for attachment to a folding panel, wherein the second body section is pivotally mounted to the first body section so as to adopt either a left or right handed orientation relative to the first body section.

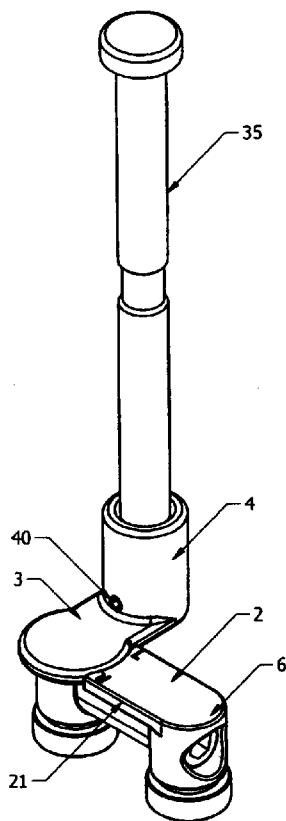


FIG 2b



(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Published:

— with international search report (Art. 21(3))

GUIDE ASSEMBLY

5 **Related Applications**

This application claims priority from Australian Patent Application No. 2010904069, the contents of which are incorporated herein by reference.

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Field of the Invention

The invention generally relates to guide assemblies for use with sliding door systems. The expression "sliding door systems" in this patent specification includes within its scope all
15 types of folding panels including doors, windows and the like, concertinaed panels, bi-fold systems and the like.

Background of the Invention

20

Conventional concertinaed folding panels such as folding door or window systems typically include a top hanger below which the panel is suspended and a bottom guide coupled to the bottom of the door. To allow panels to slide between an open and closed position the top hanger and the bottom guide may include roller bearings which are located
25 within a corresponding upper track and lower channel, respectively. To enable the panels to pivotally open inwardly or outwardly, the top hanger and the bottom guide may also include vertically oriented hanger and guide bolts, respectively.

On the lower end of the last panel that is the panel remote from the frame to which the
30 system is attached, for example the fourth door panel, the guide is in the form of an end guide. The end guide is configured to retain the bottom of the panel in the lower channel.

- 2 -

Typically, the end guide comprises a guide body with two roller bearings connected to the body to allow the end guide to roll within the channel and has a guide bolt extending therefrom.

- 5 Folding panel assemblies, such as a folding door system generally operate from either right to left or left to right. In use, the end guide is generally located under the panel so that the panel can close flush upon a jamb frame or another meeting panel. This arrangement leads to the guide body for the end guide being either suitable for left handed or right handed use.

10

A disadvantage of these types of end guides is that the need for two types of guides makes the components confusing for customers when ordering. Further, the end guide can not be reconfigured for reverse use.

- 15 Guide bolts are generally used to connect hinges associated with the sliding panels to the end guides. Known end guides typically include a threaded bore provided in the casting into which a threaded bolt is coupled. During the life cycle of the product, guide bolts may unwind themselves due to vibration in the system. Such guide bolts typically have a "HEX" profile or drive on the bolt's head so the bolt can be wound in and out of the body.
- 20 The head of the guide bolt is also visible on the external side of the closed door system.

- A disadvantage of these types of couplings between the guide bolts and the end guide is that the end guide may become disconnected from the guide bolt and hence the folding panel system. Furthermore, the bolt can easily be removed and has a visible "HEX" drive
- 25 on its head which can make the door vulnerable to break-in.

Summary of the Invention

- 30 In accordance with the present invention, there is provided a guide assembly for a folding panel assembly or system, the guide assembly including a first body section for locating

- 3 -

the assembly in a guide channel and a second body section for carrying a bolt that passes through a hinge for attachment to a folding panel, wherein the second body section is pivotally mounted to the first body section so as to adopt either a left or right handed orientation relative to the first body section.

5

In another aspect there is provided a guide assembly for a folding door system, the guide assembly including a first body section and a second body section, the second body section being operatively connected to the first body section such that in one mode it is displaceable relative to the first body section, the second body section including a bolt
10 support portion which can be oriented in different positions relative the first body section as a result of the relative displacement.

In one form when the guide assembly is in the aforementioned one mode the second body section is rotatable relative the first body section to effect said relative displacement.

15

In one form the first and second body sections may have cooperating mountings which when in the aforementioned one mode permit the relative rotation about a rotation axis, the bolt support portion being spaced from the axis of rotation. In one form the cooperating mountings may comprise a socket and an insert.

20

The guide assembly may in one form further include a locking device movable between a lock position in which relative displacement between the first and second body sections is inhibited and a release position in which the relative displacement can be effected.

25 In one form the first body section comprises an elongated member, the mounting being in the form of a socket at one end thereof, the second body section comprising an arm with the mounting in the form of an insert at one end thereof and the bolt support being at the other end thereof. The bolt support may comprise a socket for receiving an end of a guide bolt therein.

30

In one form the locking device comprises a fastener mounted to the first body section and

- 4 -

movable in direction laterally with respect to the rotation axis between the release and lock positions. In one form, when in the lock position the fastener extends into an aperture in the insert thereby inhibiting rotation of the insert. The fastener may include a threaded portion which cooperates with a threaded portion on the first body section so that rotation
5 of the fastener causes movement thereof between the release and lock positions.

In one form the guide may further include rollers operatively mounted to the first body section. In one form the insert may include an axle projecting from an end thereof to which one of the rollers is operatively mounted.
10

Brief Description of the Drawings

The invention is described, by way of non-limiting example only, by reference to the
15 accompanying drawings, in which;

Figure 1a illustrates a perspective exploded parts view of the guide assembly;

Figure 1b illustrates another perspective exploded parts view of the guide assembly with
20 the first and second body placed together;

Figure 1c illustrates a perspective view of the guide assembly with a guide bolt removed;

Figure 2a illustrates a perspective view of the guide assembly with a guide bolt and lug
25 removed;

Figure 2b illustrates a perspective view of the guide assembly with the end bolt and lug coupled thereto;

30 Figures 3a to 3d illustrate the process of actuating the guide assembly with the end bolt secured thereto between a left handed configuration and a right handed configuration; and

- 5 -

Figure 4 illustrates the guide assembly in a channel which is installed to the still base or the headboard, depending on the application.

5

Detailed Description of the Invention

Referring to Figures 1a to 1c there is illustrated a guide assembly 1 for use in a folding door system (not shown), the guide assembly 1 including a first body section 2 releasably
10 secured to a second body section 3. The second body section 3 includes a guide bolt support portion or collar 4 for receiving therein an end of a guide bolt 35 shown, for example, in Figure 2a.

The first body section 2 is in the form of an elongate member 5 with a first end 6 and a
15 second end 10. The first end 6 includes an axle 8 onto which a bearing wheel or roller 9 can be mounted, the wheel 9 being rotatable to allow the assembly 1 friction reduced passage through a channel (not shown) when in use with a folding door system or similar.

The elongate member 5 includes a central bore 11 which extends from the first end 6 to the
20 second end 10. The central bore 11 includes a mouth portion 13 located at the first end which is able to receive the head of a fastener 7 and a narrower portion towards the second end 10 which receives the shank of the fastener 7. The second end 10 includes a socket or cylindrical housing 12 which has a central axis which intersects with the central axis of the central bore 11.

25

The second body section 3 is in the form of an arm 20 extending between an end 14 and an opposing end 26. The end portion 14 of the second body 3 includes an insert 19 extending to one side of the arm 20 of the second body section 3. The insert 19 has an outer surface configured to be rotatably seated in the socket or cylindrical housing 12. A through hole
30 16 is provided in the insert through which the fastener is able to pass.

- 6 -

In this configuration, the fastener 7 is able to pass through the cylindrical housing 12 such that when the insert 19 of the second body section 3 is received within the socket or cylindrical housing 12, the fastener passes through a hole 16 located on the end portion 14 and is secured to an end bore 18 by a threaded coupling of the fastener 7 and the end bore 18.

Extending from the insert 19 is a concentrically arranged second axle 22 onto which a second bearing in the form of a wheel or roller 24 is able to be mounted. The bearing 24 serves to hold the first and second body sections 2, 3 together during free rotation therebetween, as a bolt axis is rotated about the first body section 2. The second axle 22 is aligned with the axle 8 such that wheel bearings or rollers 9, 24 are aligned.

The opposing end 26 of the arm 20 includes the guide bolt support portion 4 which extends in an opposing direction to the insert 19. More specifically, the support 4 is a generally cylindrical socket or collar with an upper circular entrance 28 and a lower portion 29 with an asymmetric internal profile in the form of a D shaped hole 30. The support 4 includes a side bore 31.

It will be appreciated that the fastener 7 is able to releasably secure the first body 2 relative the second body 3 such that when the fastener 7 is moved to a release position where the second body section 3 is able to be rotated and/or be repositioned relative the first body section 2. When the fastener 7 is moved into a lock position it is located in the central bore 11 and passes through the hole 16 of the end portion 14, the first body section 2 and the second body 3 become coupled together. Referring additionally to Figure 2a and 2b, the guide assembly 1 is shown with the fastener 7 passing through the central bore 11, the hole 16 and the end bore 18 to secure the first body 2 and the second body 3 together.

A top surface 33 of the elongate member 5 has a recessed section 34 (best appreciated in Figure 1a) towards the second end 10 into which a top surface 32 of the arm 20 is able to be received such that the top surfaces 32 and 33 are generally aligned. Accordingly, it will be appreciated that the arm 20 and the elongate casting 5 present generally planar top

- 7 -

surfaces 32 and 33, respectively.

Moreover, the junction 39 the top surface 33 of the elongate casting 5 is curved to correspond with the top surface 32 of the arm 20. Accordingly, in the released mode or condition, with the fastener disengaged, the first body 2 may be rotated relative the second body 3 without removing the round body portion 19 of the end portion 14 from the cylindrical housing 12 of the first body 2.

Referring to Figures 2a and 2b, it may be appreciated that when in an engaged mode or condition the first body section 2 and the second body section 3 provide an arrangement in which a guide bolt 35 is able to be received and supported. The guide bolt 35 includes an elongate shank 36 extending from a head 41. The lower portion of the elongate shank 36 includes a flat section 37. The flat section 37 is configured to engage with the D-shaped bore 30 to restrict the guide bolt 35 from rotation when the guide bolt 35 is inserted into the bolt support, the flat section 37 being of a lesser diameter than the elongate shank 36 such that shoulders 38 are provided. When the guide bolt 35 is inserted into the bore 30, the shoulders prevent the guide bolt 35 from passing entirely through the cylindrical housing 12.

The guide bolt 35 includes a side bore 43 which, when the guide bolt 35 is inserted into the bolt receiving portion 4 is configured to correspond to the side bore 31. A threaded lug 40 is then fastened through the side bores 31 and 43, the lug 40 securing the guide bolt 35 to the bolt receiving portion 4.

It may be appreciated that the guide bolt 35 is restricted from axial rotation by the coupling of the asymmetric profile of the D-shaped bore 30 and the corresponding flat section 37 and profile of the bolt 35. Accordingly, unlike guide bolts which include a threaded coupling between the guide bolt 35 and the guide assembly 1, in this arrangement the guide bolt 35 generally does not rotate and is less likely to work itself loose during operation such as, for example, when the guide assembly 1 and guide bolt 35 are used in conjunction with a folding door system. Furthermore, as the guide bolt 35 is not threaded,

- 8 -

the head 41 does not include a recessed portion to receive and couple with a screw driver, key or the like.

Therefore, it may be appreciated the guide bolt 35 and guide assembly 1 provided herein
5 has increased security compared to known systems where the head of a guide bolt or similar may have a recessed portion to receive and couple with a screw driver, key or the like. Furthermore, the vertical axial movement of the guide bolt 35 is restricted by the threaded lug 40 which passes through the side bores 31 and 43. Due to the configuration of the D-shaped bore 30 and the flat section 37, the lug 40 is able to be relatively small and
10 positioned such that when the guide assembly 1 and the guide bolt 35 are used with a folding door system or similar the lug 40 can only be accessed when the folding doors are open which reduces the security threat.

Referring now to Figures 3a to 3d, the guide assembly 1 is illustrated as being moved from
15 a left hand orientation to a right hand orientation. To indicate the orientation of the first body 2 relative to the second body 3 the top surface 32 of the arm 20 includes the letters "L" and "R" on opposing sides. The left hand orientation is indicated with an "L" located closest to the first end 6, while the right hand orientation is indicated with an "R" located closest to the first end 6.

20

Beginning at Figure 3a the guide assembly is shown in an engaged condition in a left hand orientation with the guide bolt 35 secured in place and the fastener 7 securing the first body 2 to the second body 3. A key 42 is shown which may be engaged with the head of the fastener 7, as indicated by arrow "A" and rotated in the direction of arrow "B" to loosen
25 the fastener 7 as is shown in Figure 3b. Once the fastener is loosened, the second body 3 may be freely rotated in the direction indicated by arrow "C", whilst still being held to the first body section 2 by the bearing wheel 24. Accordingly, the arm 20 is rotated through approximately 180, such that the letter "R" is moved closest to the first end 6 as is illustrated in 3d. The fastener 7 is then inserted through the hole 16 of the end portion 14 and secured
30 into the end bore 18 to secure the first body 3 to the second body 3.

- 9 -

As may be appreciated from Figures 3a to 3d the guide assembly provides an ambidextrous fitting with minimal parts and clear labels (the letter "L" and "R") which allows the guide assembly to be simple to reconfigure between a left handed and a right handed orientation. Furthermore, advantageously the coupling of the guide bolt 35 and the second body 3 is
5 such that the guide bolt 35 does not generally rotate and therefore does not tend to work loose during use. Moreover, the lug 40 associated with the guide bolt 35 is not easily visible and therefore does not provide an easy visible access means to remove the guide bolt 35 from the guide assembly hence providing a security advantage when used with a folding door system or similar.

10

With reference now to Figure 4, the guide assembly 1 is shown in an in use environment, with the first body portion 2 and bearing wheels 9, 24 in a channel 44. In the example shown, the channel 44 is formed of an aluminium extrusion 45 with a polypropylene channel 46 inserted, although other suitable channel structures can instead be used, as
15 appropriate. As illustrated in Figure 4, the guide assembly 1 can be used in both top hung and bottom folding applications – the channel 44 is either installed to the sill base or the headboard depending on the application.

Many modifications will be apparent to those skilled in the art without departing from the
20 scope of the present invention.

The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived
25 from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will
30 be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

List of Parts

1. Guide assembly
2. First body
3. Second body
4. Bolt support portion
5. Elongate body
6. First end
7. Fastener
8. Axle
9. Bearing wheel or roller
10. Second end
11. Central bore
12. Socket or cylindrical housing
13. Mouth portion
14. Insert
15. Casting
16. Hole
18. End bore
19. Body portion
20. Arm
22. Second axle
24. Second bearing or wheel
26. Opposing end portion
28. Circular entrance
29. Lower portion
30. D-shaped hole
31. Side bore
32. Top surface
33. Top surface
34. Recessed section

- 11 -

- 35. Guide bolt
- 36. Elongate shank
- 37. Flat section
- 38. Shoulder
- 39. Junction
- 40. Lug
- 41. Head
- 42. Key
- 43. Side bore
- 44. Channel
- 45. Extrusion
- 46. Channel

Claims:

1. A guide assembly for a folding panel assembly or system, the guide assembly including a first body section for locating the assembly in a guide channel and a second body section for carrying a bolt that passes through a hinge for attachment to a folding panel, wherein the second body section is pivotally mounted to the first body section so as to adopt either a left or right handed orientation relative to the first body section.
2. The guide assembly of claim 1, further including a bearing which is received in the guide channel and which holds the first and second body sections together during free rotation therebetween as a bolt axis is rotated about the first body section.
3. The guide assembly of claim 1, further including a fastener to lock the second body section in either the left or right handed orientation.
4. The guide assembly of claim 3, wherein the first body section includes a bore for the fastener and the second body section includes an insert arranged to rotatably fit in a socket of the first body section, the insert having a through hole which aligns with the bore, when the second body section is in the left or right handed orientation, to receive the fastener and thereby allow the two body sections to be locked together.
5. The guide assembly of claim 4, wherein the second body section includes a collar for receiving an end of the bolt, the collar having an asymmetric internal profile to match an external profile of the bolt and a side bore, adapted to receive a lug which passes through the side bore for interconnection with a corresponding side bore in the bolt, to secure the bolt against removal from the assembly.
6. The guide assembly of claim 4, further including two wheels for engaging in the guide channel, the first wheel being carried by the first body section at an underside

- 13 -

of the assembly and the second wheel being carried by an axle of the second body section which passes through the socket of the first body section so that the second wheel is also carried at an underside of the assembly.

7. A guide assembly for a folding door system, the guide assembly including a first body section and a second body section, the second body section being operatively connected to the first body section such that in one mode it is displaceable relative to the first body section, the second body section including a bolt support portion which can be oriented in different positions relative the first body section as a result of the relative displacement.
8. The guide assembly of claim 7, wherein when in said one mode the second body section is rotatable relative the first body section to effect said relative displacement.
9. A guide assembly according to claim 8, wherein the first and second body sections have cooperating mountings which when in said one mode permit said relative rotation about a rotation axis, the bolt support portion being spaced from the axis of rotation.
10. A guide assembly according to claim 9, wherein the cooperating mountings comprise a socket and an insert.
11. A guide assembly according to any preceding claim further including a locking device movable between a lock position in which relative displacement between the first and second body sections is inhibited and a release position in which the relative displacement can be effected.
12. A guide assembly according to any preceding claim wherein the first body section comprises an elongated member, the mounting being in the form of a socket at one end thereof, the second body section comprising an arm with the mounting in the

- 14 -

form of an insert at one end thereof and the bolt support being at the other end thereof.

13. A guide assembly according to claim 12, wherein the bolt support comprises a socket for receiving an end of a guide bolt therein.
14. A guide assembly according to claim 13, wherein the locking device comprises a fastener mounted to the first body section and movable in direction laterally with respect to the rotation axis between the release and lock positions.
15. A guide assembly according to claim 14, wherein when in the lock position the fastener extends into an aperture in the insert thereby inhibiting rotation of the insert.
16. A guide assembly according to claim 15, wherein the fastener includes a threaded portion which cooperates with a threaded portion on the first body section so that rotation of the fastener causes movement thereof between the release and lock positions.
17. A guide assembly according to claim 16, further including rollers operatively mounted to the first body section.
18. A guide assembly according to claim 17, wherein the insert includes an axle projecting from an end thereof to which one of the rollers is operatively mounted.
19. A guide assembly substantially as described with reference to the drawings and/or examples.

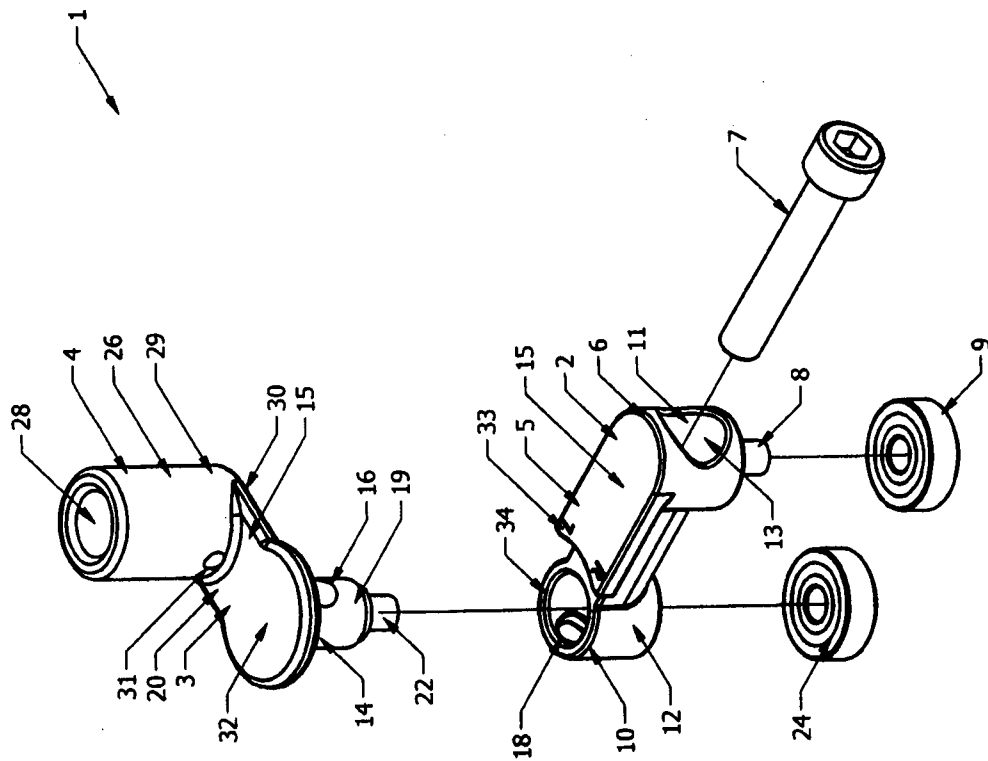


FIG 1a

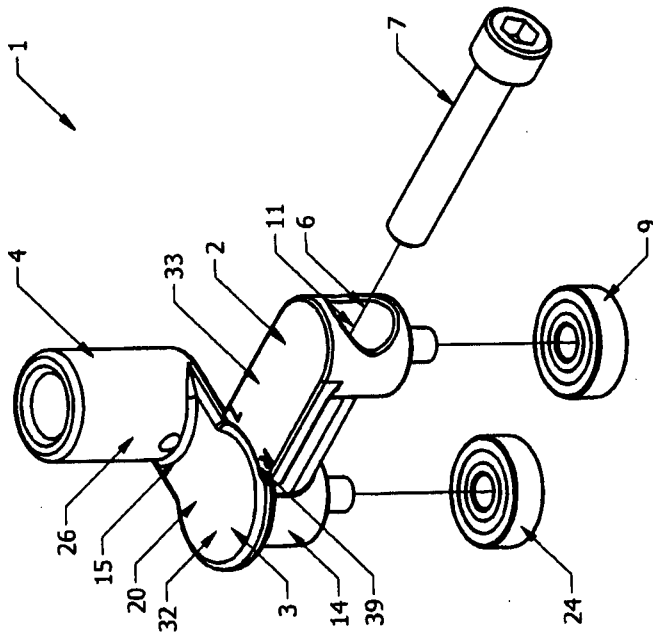


FIG 1b

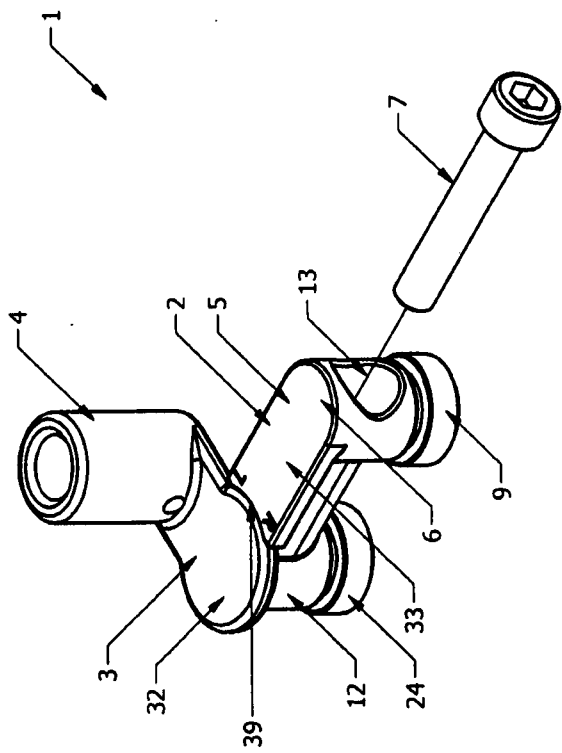


FIG 1c

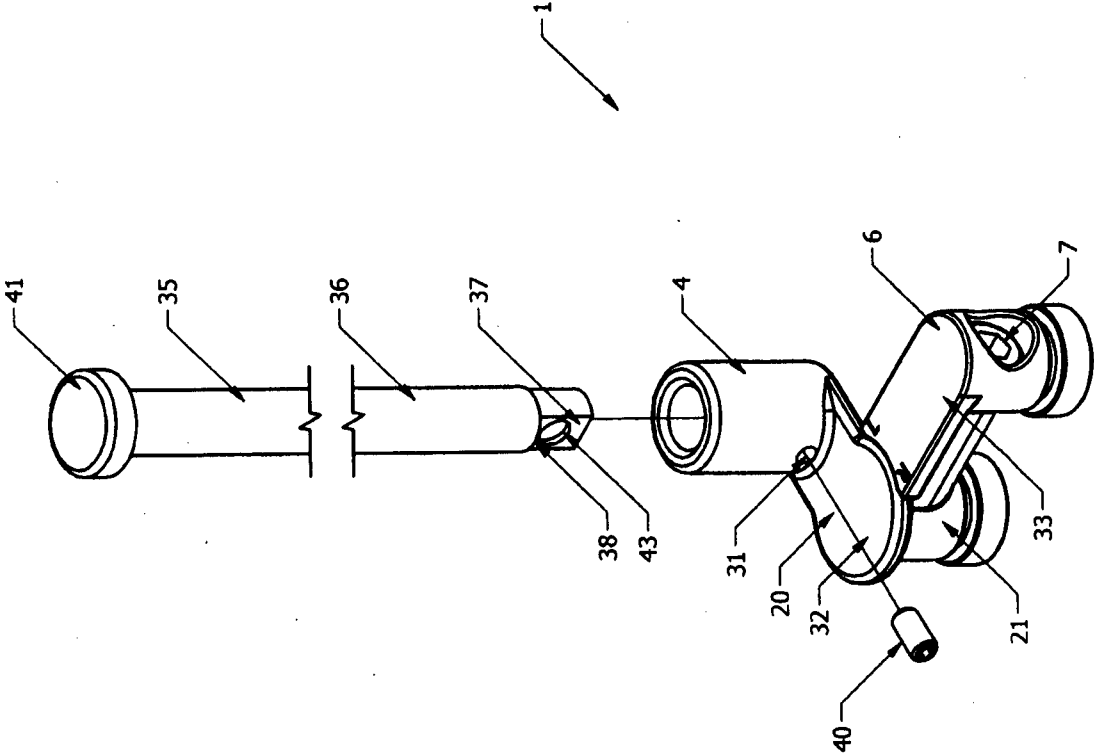


FIG 2a

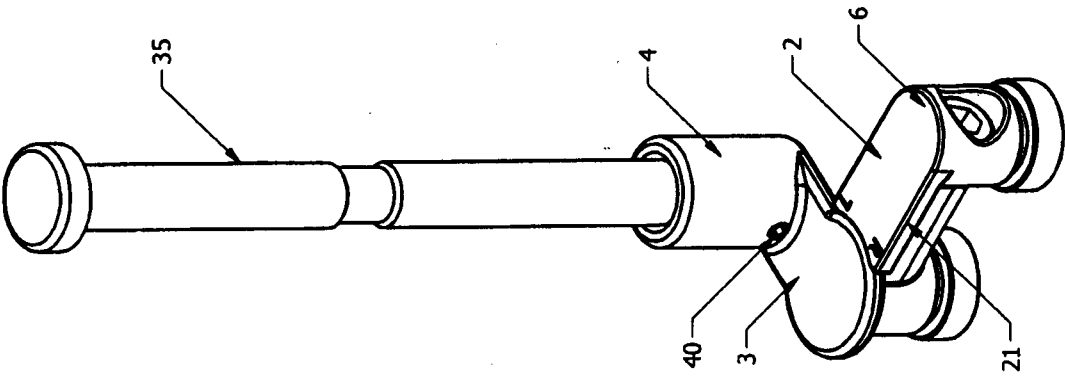


FIG 2b

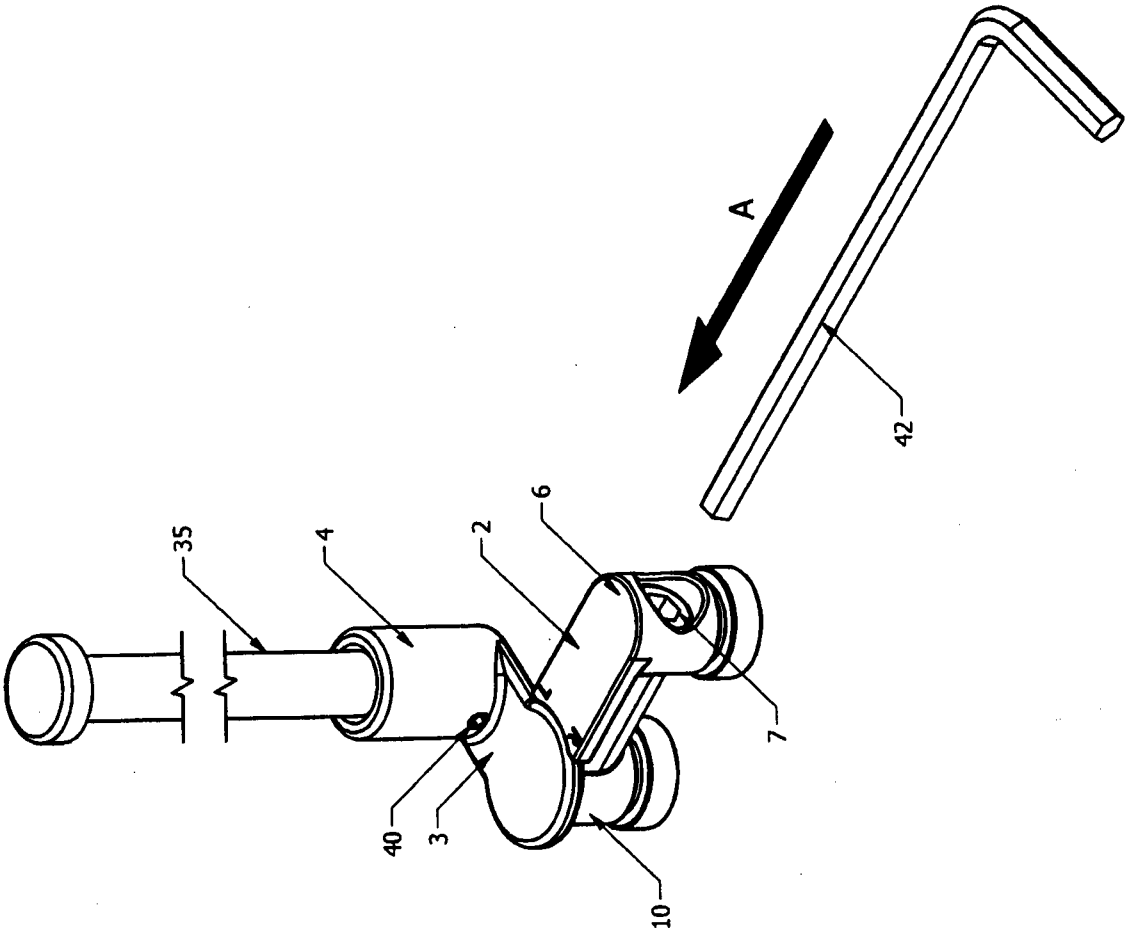


FIG 3a

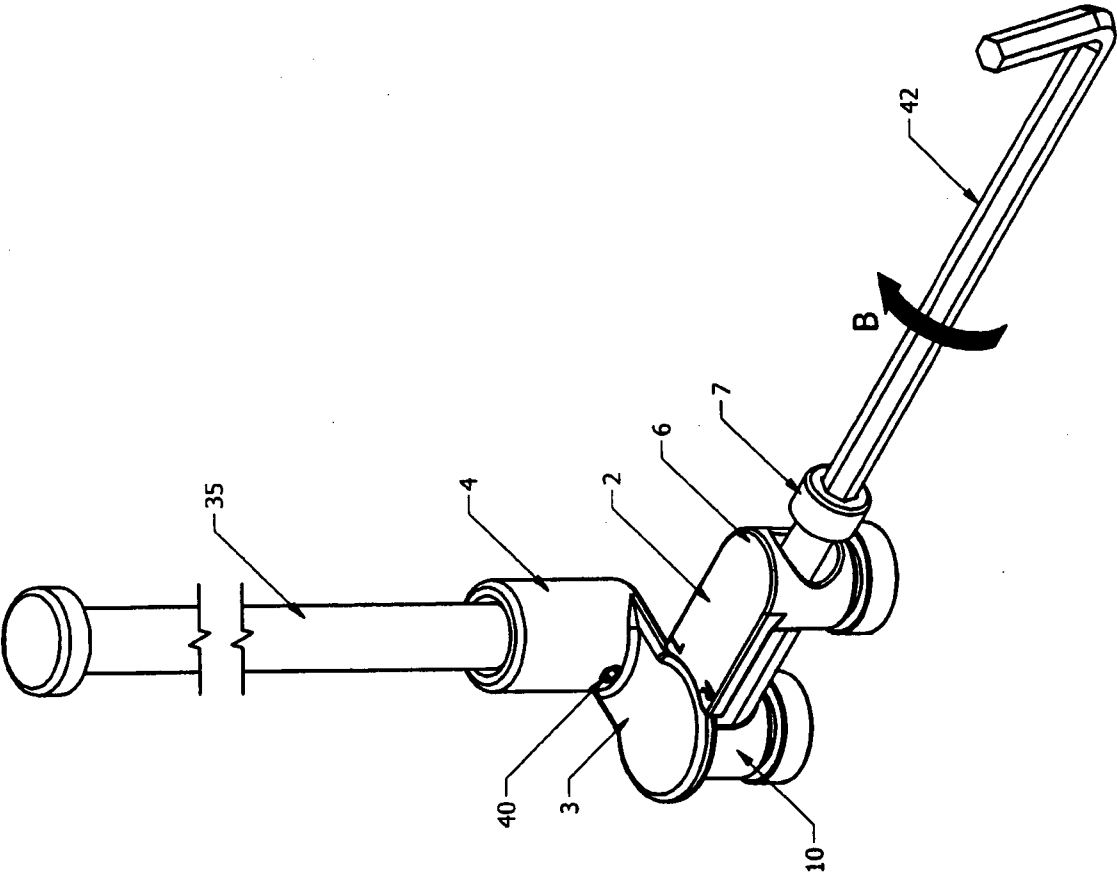


FIG 3b

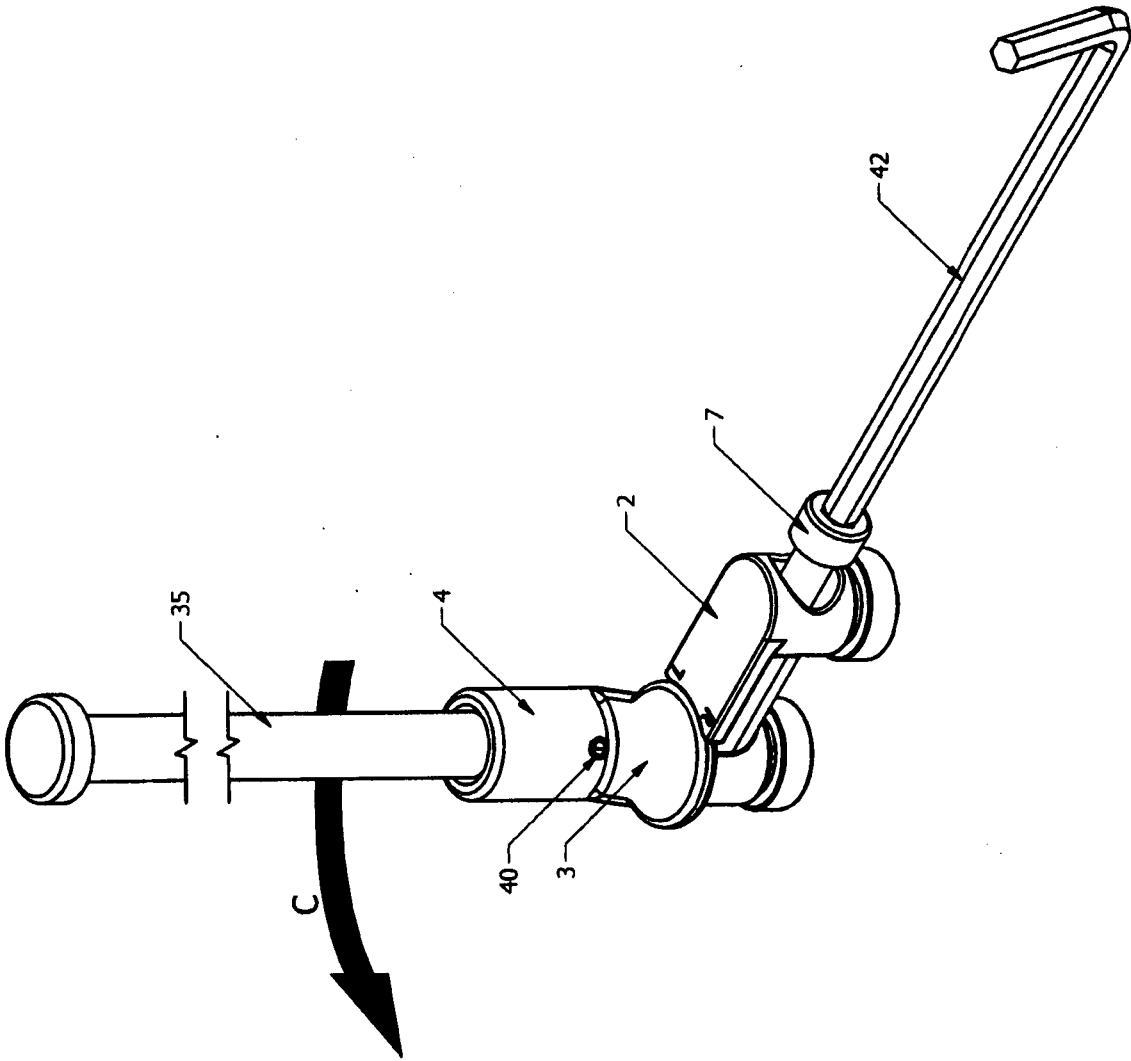


FIG 3c

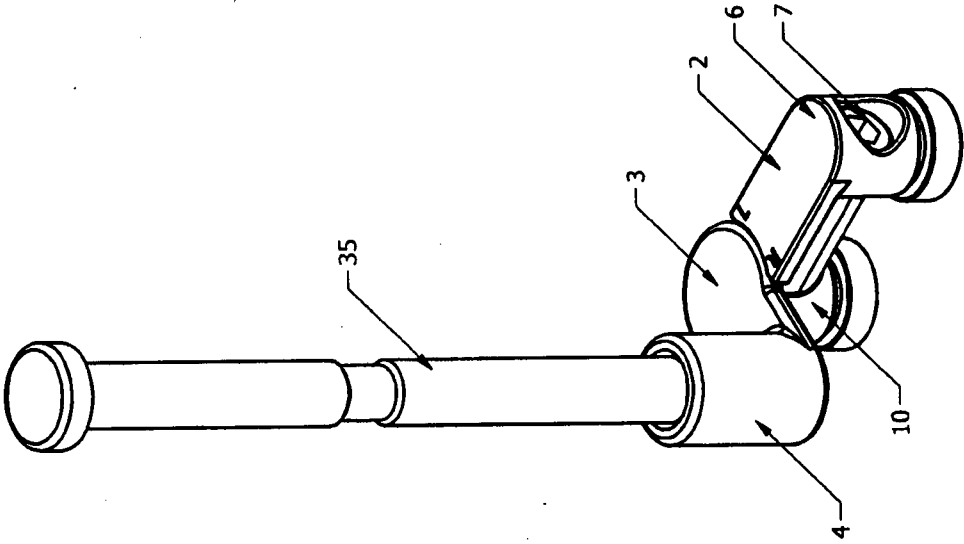


FIG 3d

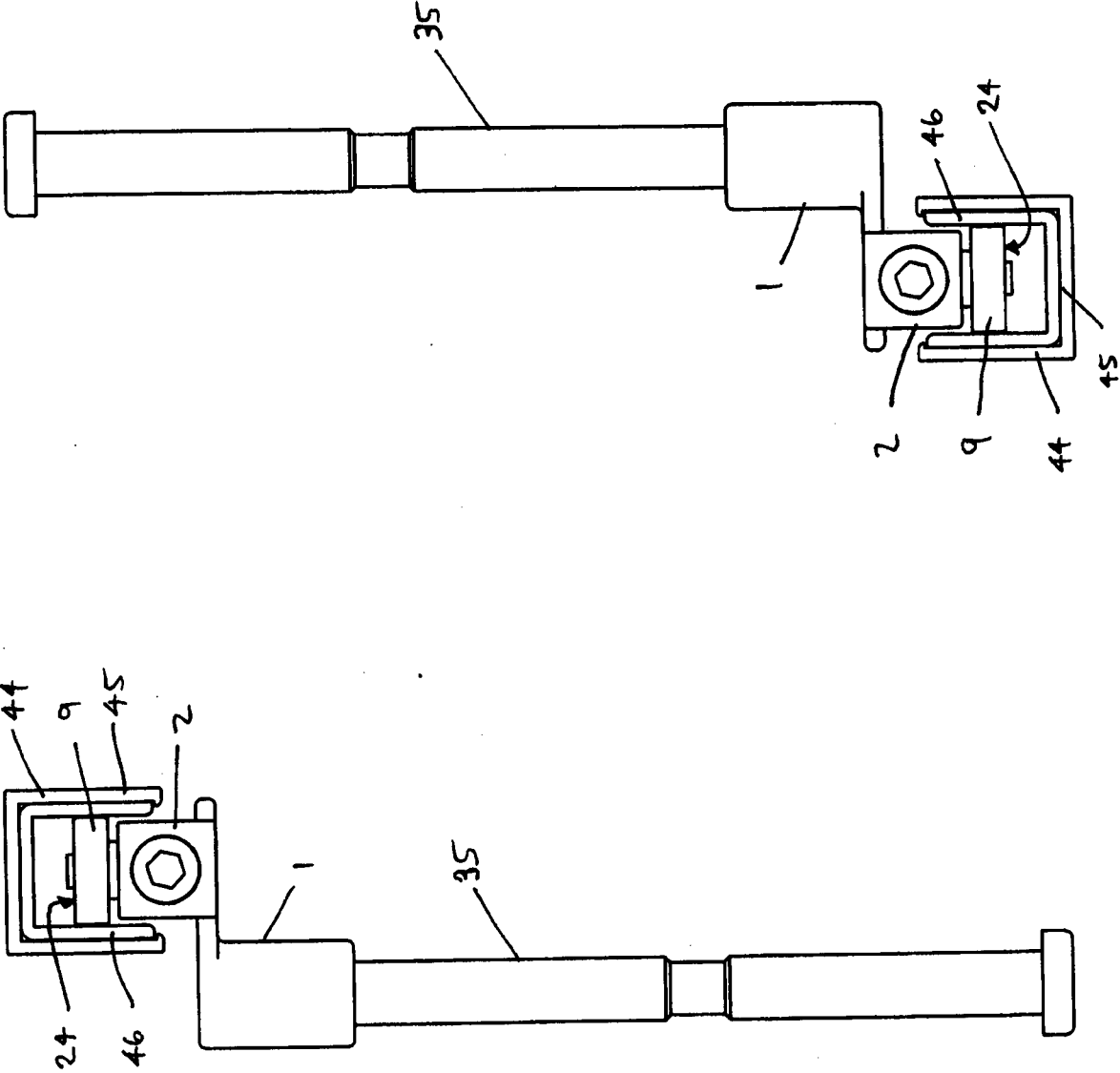


FIG 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2011/000982

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

E05D 7/02 (2006.01)*E05D 7/08* (2006.01)*E05D 15/26* (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC: Keywords: BIFOLD, SLIDE, CONCERTINA, FOLD, FRENCH, CHANGE, REVERSE, ADJUST, UNIVERSAL, CONFIGURE, ORIENT, DISPLACE, RIGHT HAND, LEFT HAND, PIVOT, ROTATE, SEIVEL, TURN, KNUCKLE, SOCKET, GUIDE, CHANNEL, RUNNER, SLOT, GROOVE, SOCKET, SECURE, IMMOBILISE, FASTEN, CONNECT, RELEASE and like terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1499312 A (FERRIS) (24 June 1924) Page 1, lines 35-45, Figure 2	1, 7-10, 12, 13
X	US 1545565 A (LANG) 14 July 1925 Page 2 lines 16-29, Figures 3 and 4.	7-10, 12, 13
X	US 1503364 A (HOWAT) 29 July 1924 Page 1, lines 12-19, 67-72; Page 2 lines 10-14, Figure 2	7-10, 12, 13
X	US 1384763 A (JORDAN) 19 July 1921 See page 2, lines 58-65, Figures 3 and 4	7-10



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
4 October 2011

Date of mailing of the international search report
07/10/2011

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2011/000982**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 19
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

The claims do not comply with Rule 6.2(a) because they rely on references to the description and/or drawings.
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2011/000982

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member
US	1499312	NONE
US	1545565	NONE
US	1503364	NONE
US	1384763	NONE
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.		
END OF ANNEX		