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(54) Title: IUD LOADING DEVICES AND METHODS FOR INSERTING AN IUD INTO AN INSERTION DEVICE

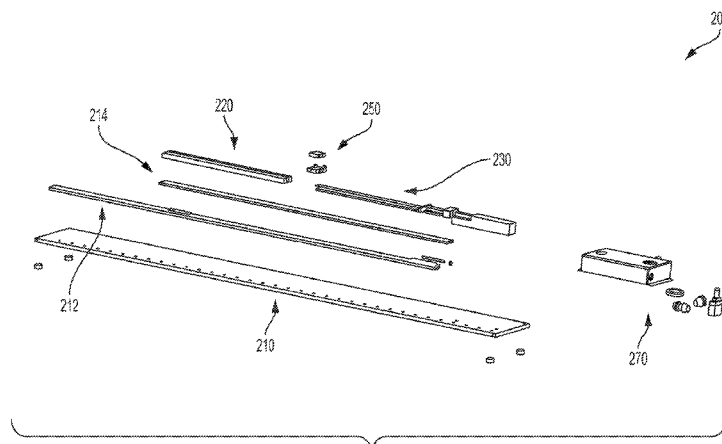


FIG. 2A

(57) Abstract: Disclosed are devices and methods for loading an intrauterine device (IUD) with a thread or suture engaged therewith into an insertion device. The devices and methods are suitable for use with an automated knot typing system.



**IUD LOADING DEVICES AND METHODS FOR INSERTING AN IUD  
INTO  
AN INSERTION DEVICE**

**CROSS-REFERENCE**

[0001] This application claims priority to U.S. Utility Application 15/214,164 filed July 19, 2016, which claims the benefit of U.S. Provisional Application No. 62/198,961, filed July 30, 2015, entitled *Loading Device for IUDs and Insertion Devices* which application is incorporated herein by reference.

**BACKGROUND**

[0002] An intrauterine device (IUD) is an object that, when placed in the uterus of a female, acts as a birth control device to prevent pregnancy. Two types of IUDs are commonly available, copper-containing devices and hormone-containing devices that release a progestogen. Hormonal containing devices are considered to be a different form of birth control and may be distinguished in the literature by the term intrauterine system (IUS).

[0003] IUDs are typically inserted into the uterus using an insertion device or instrument. *See, for example*, U.S. Patent **3,783,861** to Abramson for *Insertor for Intrauterine Devices* issued January 8, 1974; **3,794,025** to Lerner for *Intrauterine Device Saddle Insertor* issued February 26, 1974; **4,920,727** to Ristimaki et al. for *Cassette System and Apparatus for Manufacturing an Active Agent Liberating Capsule for Subcutaneous Use* issued May 1, 1990; **4,949,732** to Spoon et al. for *Apparatus for Insertion and Fixation of an Intra Uterine Contraceptive Device to the Uterine Fundus* issued August 21, 1990; **5,084,004** to Ranoux for *Process for Intra-Uterine Fertilization in Mammals and Device for Implementation Thereof* issued January 28, 1992; **5,370,129** to Diaz et al. for *IUD Inserting Apparatus* issued December 6, 1994; **5,400,804** to Helle et al. for *Method and Equipment for Installing a Medicine Capsule on a Support* issued March 28, 1995; **5,785,053** to Macandrew et al. for *Insertor for the Positioning of an Intrauterine Device* issued July 28, 1998; and **US 2013/0014762 A1** to Deckman et al. for *Intrauterine Systems, IUD Insertion Devices, and Related Methods and Kits Therefor* published January 17, 2013.

[0004] During manufacturing of the system various challenges arise loading a threaded IUD into the distal end of the IUD insertion device such that the IUD is ready for deployment during use.

### SUMMARY

[0005] Disclosed are intrauterine device (IUD) insertion device loaders and methods for loading an IUD with a flexible member, such as a thread or suture engaged therewith, into an IUD insertion device. The disclosed IUD insertion device loaders and methods are suitable for use with an automated knot tying system.

[0006] An aspect of the disclosure is directed to an IUD loading device. Suitable IUD loading devices comprise: an elongated planar base having an upper surface and a lower surface; a linear slider engaging the upper surface of the planar base; a support plate secured to a portion of the linear slider; an IUD retainer; a clamp having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end; and an inserter device retainer. Additionally, operation of the device can be controlled by pneumatic controls. Additionally, a vacuum applicator, such as a vacuum pump or venturi pump, can be provided in at least some configurations. The clamp may have a bivalve configuration that is openable about a hinge. Additionally, the insertion device retainer can include a hypotube. Additionally, the IUD retainer can comprise a channel for one or more flexible members of the IUD.

[0007] Another aspect of the disclosure is directed to an IUD loading device comprising: an elongated planar base having an upper surface and a lower surface; an IUD retainer; a clamp having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end; an inserter retainer; and pneumatic controls configured to draw a flexible member of an IUD through the clamp and into an inserter. The clamp can be openable about a hinge. Additionally, the insertion device retainer can be a hypotube. A channel can

be provided for one or more flexible members of the IUD. Additionally a vacuum applicator, such as a vacuum pump or venturi pump, can be provided.

**[0008]** Still another aspect of the disclosure is directed to a method of inserting an IUD into an IUD insertion device. Suitable methods comprise: placing an IUD in an IUD retainer of an IUD loading device; positioning the IUD in the IUD retainer of the IUD loading device adjacent a first aperture in a clamp; placing an IUD inserter in an IUD inserter retainer of an IUD loading device; positioning the IUD inserter retainer of the IUD loading device adjacent a second aperture in the clamp; and applying a vacuum on the IUD inserter retainer and drawing one or more flexible members of the IUD into an aperture in the IUD insertion device. The methods can also include passing a hypotube through the IUD insertion device and/or feeding the flexible members of the IUD into the first aperture of the clamp.

**[0009]** Yet another aspect of the disclosure is directed to an IUD loading device means. Suitable IUD loading device means comprise: an elongated planar base having an upper surface and a lower surface; a linear slider means engaging the upper surface of the planar base; a support plate secured to a portion of the linear slider; an IUD retainer means; a clamp means having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end; and an insertion device retainer means. Additionally, a pneumatic control or pneumatic control means can be provided. In at least some configurations a vacuum pump or vacuum pump means (e.g. venturi pump) is also provided. Additionally, the clamp means can be configurable to be openable about a hinge. The insertion device retainer means can be a hypotube. Additionally, the IUD retainer means can comprise a channel for one or more flexible members of the IUD.

**[0010]** Another aspect of the disclosure is directed to a method of inserting an IUD into an IUD insertion device comprising: placing an IUD in an IUD retainer means of an IUD loading device means; positioning the IUD in the IUD retainer means of the IUD loading device means adjacent a first aperture in a clamp; placing an IUD inserter in an inserter retainer means of an IUD loading device means; positioning the IUD inserter retainer means of the IUD loading device adjacent a second

aperture in the clamp; and applying a vacuum on the IUD inserter retainer means and drawing one or more flexible members of the IUD into an aperture in the insertion device. Additionally, the method can include passing a hypotube through the IUD insertion device and/or feeding the flexible members of the IUD into the first aperture of the clamp.

**[0011]** Still another aspect of the disclosure is directed to an IUD loading device comprising: an elongated planar base means having an upper surface and a lower surface; an IUD retainer means; a clamp means having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end; an inserter retainer means; and pneumatic control means configured to draw a flexible member of an IUD through the clamp means and into an inserter means. The clamp means can be openable about a hinge means. Additionally, the insertion device retainer means can be a hypotube. A channel can be provided for one or more flexible members of the IUD. Additionally a vacuum applicator means can be provided.

### **INCORPORATION BY REFERENCE**

**[0012]** All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0013]** The novel features of the invention are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present invention will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the invention are utilized, and the accompanying drawings of which:

**[0014] FIGS. 1A-D** illustrate an IUD, an IUD positioned within the distal end of an IUD insertion device prior to deployment; an exemplar IUD insertion device, and a packaged IUD and IUD insertion device;

[0015] FIGS. 2A-C is an exploded view of a IUD insertion device loader for use associating an IUD with an IUD insertion device; a close-up of the hinged member; and a perspective view of the IUD insertion device loader in an assembled form; and [0016] FIGS. 3A-G illustrate the steps of using the IUD insertion device loader.

### DETAILED DESCRIPTION

[0017] FIGS. 1A-D illustrates a T-frame intrauterine device (IUD), having an eyelet (aperture) at one end through which a flexible member, such as a thread or suture, is secured. A conventional T-shaped IUD **102**, is illustrated in FIG. 1A. IUDs typically have a length of from about 31.5 mm to about 32.5 mm and a width of from about 31.5 mm to about 32.5 mm when the IUD is in the fully deployed position. As will be appreciated by those skilled in the art, the length does not include the knot or strings that may accompany the IUD. The T-shaped IUD comprises an elongated body **104** having a proximal end **10** and a distal end **20**. The elongated body **104** can include a time-release drug such as a hormone. In some configurations, the time-release drug can be provided as a coating or covering. The elongated body can be formed from any suitable material, including, but not limited to plastic or metal alloy. At the distal end **20** of the IUD (i.e., the end positioned away from the physician's hand), IUD arms **106a**, **106b** are attached to or integrally formed with the elongated body **104**. The IUD arms **106a**, **106b** are configurable to fold upward **u** or downward **d** to minimize the IUD cross-section such that the IUD can fit into an insertion device sheath or tube for insertion through the cervix and into the uterus during deployment. Additionally, either or both of the IUD arms **106a**, **106b** are configurable to include an enlarged or bulbous tip **108a**, **108b**, which can, for example, have a curved, spherical or semi-spherical shape. The bulbous tips **108a**, **108b** of the IUD arms **106a**, **106b** can be formed such that the IUD arms **106a**, **106b**, when folded upward and pushed together, form a smooth and rounded distal tip. At the proximal end **10** of the IUD **102**, the IUD **102** can further include one or more flexible members **110a**, **110b**, such as strings, attached to the IUD **102**. The flexible members **110a**, **110b** are connectable to the IUD **102** at a connection point **111** which can be an aperture or eyelet in the elongated body **104** at the proximal end **10**, e.g., tied in a knot as illustrated.

[0018] For purposes of providing perspective to the various components of the loading device and the IUD and IUD insertion device, the relative terms of proximal

and distal have been used where proximal refers to the end closest to the user and distal refers to the end further away from the user. Thus it is convenient to describe the loading device in a way which references the positioning of the proximal and distal ends of the IUD and the IUD insertion device. These references are provided for convenience of disclosure and are not meant to be limiting.

[0019] **FIG. 1B** is a cross-section of an insertion device (such as the insertion device shown in **FIG. 1C**). As can be seen in this illustration when the IUD **102** is positioned at the distal tip or the elongated sheath **132** of the IUD insertion device **100** prior to deployment, the distal **20** tip has an aperture **131** with a diameter **d1** that is smaller than the diameter **d3** of the IUD **102**. The aperture of the IUD insertion device **100** has a diameter **d1** that is smaller than the diameter **d2** of the sheath of the IUD insertion device **100**. The IUD **102** is rotatable **r** in-plane about longitudinal axis **x**, such that the IUD arms **106a**, **106b** or similar features of the IUD **102** will deploy in-line with respective openings of the patient's fallopian tubes.

[0020] An exemplar IUD insertion device **100** is illustrated in **FIG. 1C**. The IUD insertion device **100** is configurable to comprise a first cavity **145a** and a second cavity **145b** in the handle **135**. During step 3 of the insertion procedure, the sheath slider **142** and string control slider **146** are in the full proximal **10** position along the longitudinal axis of the elongated guide, and at least partially surrounded by the second cavity **145b** which is proximal to the first cavity **145a**. Additional visual indication features **160**, **160'**, **160''** are shown. Visual indication features can be provided on the elongated sheath **143**, the handle **135**, or both. The numbers 1, 2, and 3 on the insertion device components provide a visual indication to the user the appropriate positions of the insertion device components during the multiple phases of the insertion procedure. Visual indicators, such as numbers, can be applied in any suitable fashion including, but not limited to, printing, etching, molding, stamping, and the like. Moreover, visual indicators can be positioned such that they are visible only during certain aspects of the procedure, and not visible during other aspects of the procedure.

[0021] **FIG. 1D** illustrates an IUD partially positioned within the distal end of an IUD deployment device within packaging **190**. The IUD arms **106a**, **106b** extend beyond the distal end of the IUD deployment device **100**.

[0022] **FIG. 2A** is an exploded view of an IUD insertion device loader **200**. The IUD insertion device loader **200** has an elongated planar base **210** which supports a

linear slider **212**. A support plate **214** can also be provided which engages the linear slider **212**. An insertion device retainer **230** is provided and is configurable to engage the insertion device (such as the IUD insertion device **100** shown in **FIG. 1C**) during the loading process. An IUD retainer **220** is positioned in-line with the insertion device retainer **230** and positioned above the support plate **214**. A clamp **250** is positioned between the IUD retainer **220** and the insertion device retainer **230**. Pneumatic controls **270** can be provided at one end of the assembly to apply a vacuum, for example on an end of the assembly having the insertion device retainer **230**. The vacuum can be applied by any suitable vacuum applicator, such as a vacuum pump or venturi pump. The pneumatic controls can include pneumatically controlled valves that control the flow of pressurized air. Suitable valves include, for example, needle valves. The support plate **214** can engage the linear slider **212** and elongated planar base **210** by any suitable mechanism including, for example, the use of screws, bolts, washers, nuts, adhesive materials, or any other suitable material or device.

**[0023] FIG. 2B** is a close-up of the clamp **250** in an open configuration which, when closed, has an aperture therethrough forming a channel **252** formed in one or both the surfaces of the interior surfaces **254, 254'** of the clamp **250**. In one configuration, the clamp **250** is a bivalve having two similar parts hinged together. The two parts or plates **256, 256'** of the clamp **250** open and close about a hinge **258**. When the clamp **250** is closed an aperture extends linearly from a first end to a second end. The aperture has a first recess **260** on the first end, followed by a central tubular portion **260'** forming an interior portion of the aperture, and then a second recess **260''** on the second end. As illustrated the first and second recesses are shaped to define a conical aperture where the widest portion of the aperture is adjacent the exterior surface of the clamp **250**, and the narrowest portion is adjacent the central tubular portion **260'**. As will be appreciated by those skilled in the art, other shapes could be used without departing from the scope of the disclosure. During use, the clamp **250** can be secured in a closed position using any suitable mechanism, including, but not limited to the use of magnetic material, suitable clasps or pins.

**[0024] FIG. 2C** illustrates the IUD insertion device loader **200** shown in **FIG. 2A** in an assembled configuration.



**[0025] FIGS. 3A-G** illustrate the steps of using the IUD insertion device loader **200** shown in **FIG. 2**. The IUD insertion device **100** is placed on the insertion device retainer **230**. A hypotube **280** of the IUD insertion device loader **200** is inserted into a proximal aperture **148** of IUD insertion device **100**. A suitable hypotube **280** is a small radiused tube which can, for example, be made from stainless steel. The hypotube **280**, passes through a central aperture of the IUD insertion device **100** from the proximal end **10** until it exits a distal end **20** of the IUD insertion device **100**. The end of the hypotube **280** extending out of the distal end of the IUD insertion device **100** is placed within the central channel **260'** formed in the clamp **250** while the clamp **250** is in an open position (shown in **FIG. 2B**). The distal end **20** of the IUD insertion device **100** is positioned within the first recess **260** which is a conical aperture formed at the insertion device receiving end of the clamp **250**. The positioning of the IUD insertion device **100** is such that the distal end **20** of the IUD insertion device **100** is not pinched by the clamp **250** when the clamp **250** is in a closed position (shown in **FIG. 3F**), or otherwise engaged by the clamp **250** to cause deformation of the distal end **20** of the IUD insertion device **100**. The IUD **102** is placed within the IUD retainer **220** so that the flexible members **110a, 110b**, or strings, are positioned near the IUD receiving conical opening **252''** of the clamp **250**. The end of the strings or flexible members **110a, 110b** are positioned near enough the IUD receiving conical recess **252''** of the clamp **250** so that when the vacuum is applied by the vacuum applicator to the hypotube passing through the IUD insertion device **100** into the clamp **250**, the strings or flexible members **110a, 110b** are placed a centimeter or two inside the inner channel **252'** of the clamp/hypotube and then the vacuum draws the flexible members **110a, 110b** through the remainder of the IUD insertion device.

**[0026]** Thereafter, the clamp **250** is opened, and the IUD **102** is drawn into a final position within the IUD insertion device **100** so that the IUD **102** and IUD insertion device **100** are ready to be packaged and shipped as shown in **FIG. 1D**.

**[0027]** Once the IUD is positioned within the IUD inserter device, the device can be packaged, sterilized and shipped.

**[0028]** While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the

invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

## CLAIMS

### WHAT IS CLAIMED IS:

1. An IUD loading device comprising:  
an elongated planar base having an upper surface and a lower surface;  
a linear slider engaging the upper surface of the planar base;  
a support plate secured to a portion of the linear slider;  
an IUD retainer;  
a clamp having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end; and  
an inserter device retainer.
2. The IUD loading device of claim 1 further comprising a pneumatic control.
3. The IUD loading device of claim 1 further comprising a vacuum applicator.
4. The IUD loading device of claim 1 wherein the clamp is openable about a hinge.
5. The IUD loading device of claim 1 wherein the insertion device retainer is a hypotube.
6. The IUD loading device of claim 1 wherein the IUD retainer comprises a channel for one or more flexible members of the IUD.
7. An IUD loading device comprising:  
an elongated planar base having an upper surface and a lower surface;  
an IUD retainer;  
a clamp having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the

second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end;  
an inserter retainer; and  
pneumatic controls configured to draw a flexible member of an IUD through the clamp and into an inserter.

8. The IUD loading device of claim 7 wherein the clamp is openable about a hinge.

9. The IUD loading device of claim 7 wherein the insertion device retainer is a hypotube.

10. The IUD loading device of claim 7 wherein the IUD retainer comprises a channel for one or more flexible members of the IUD.

11. The IUD loading device of claim 7 further comprising a vacuum applicator.

12. A method of inserting an IUD into an IUD insertion device comprising:  
placing an IUD in an IUD retainer of an IUD loading device;  
positioning the IUD in the IUD retainer of the IUD loading device adjacent a first aperture in a clamp;  
placing an IUD inserter in an IUD inserter retainer of an IUD loading device;  
positioning the IUD inserter retainer of the IUD loading device adjacent a second aperture in the clamp; and  
applying a vacuum on the IUD inserter retainer and drawing one or more flexible members of the IUD into an aperture in the IUD insertion device.

13. The method of inserting the IUD into the IUD insertion device of claim 12 further comprising passing a hypotube through the IUD insertion device.

14. The method of inserting the IUD into the IUD insertion device of claim 12 further comprising feeding the flexible members of the IUD into the first aperture of the clamp.

15. An IUD loading device means comprising:
  - an elongated planar base having an upper surface and a lower surface;
  - a linear slider means engaging the upper surface of the planar base;
  - a support plate secured to a portion of the linear slider;
  - an IUD retainer means;
  - a clamp means having a linear aperture therethrough and having a first clamp end and a second clamp end wherein the linear aperture at the first clamp end has a first diameter which tapers to a second aperture diameter central to the first clamp end and further wherein the linear aperture at the second clamp end has a first diameter which tapers to a second aperture diameter central to the second clamp end; and
  - an insertion device retainer means.
16. The IUD loading device of claim **15** further comprising a pneumatic control.
17. The IUD loading device of claim **15** further comprising a vacuum applicator.
18. The IUD loading device of claim **15** wherein the clamp means is openable about a hinge.
19. The IUD loading device of claim **15** wherein the insertion device retainer means is a hypotube.
20. The IUD loading device of claim **15** wherein the IUD retainer means comprises a channel for one or more flexible members of the IUD.
21. A method of inserting an IUD into an IUD insertion device comprising:
  - placing an IUD in an IUD retainer means of an IUD loading device means;
  - positioning the IUD in the IUD retainer means of the IUD loading device means adjacent a first aperture in a clamp;
  - placing an IUD inserter in an inserter retainer means of an IUD loading device means;
  - positioning the IUD inserter retainer means of the IUD loading device adjacent a second aperture in the clamp; and

applying a vacuum on the IUD inserter retainer means and drawing one or more flexible members of the IUD into an aperture in the insertion device.

22. The method of inserting the IUD into the IUD insertion device of claim **21** further comprising passing a hypotube through the IUD insertion device.

23. The method of inserting the IUD into the IUD insertion device of claim **21** further comprising feeding the flexible members of the IUD into the first aperture of the clamp.

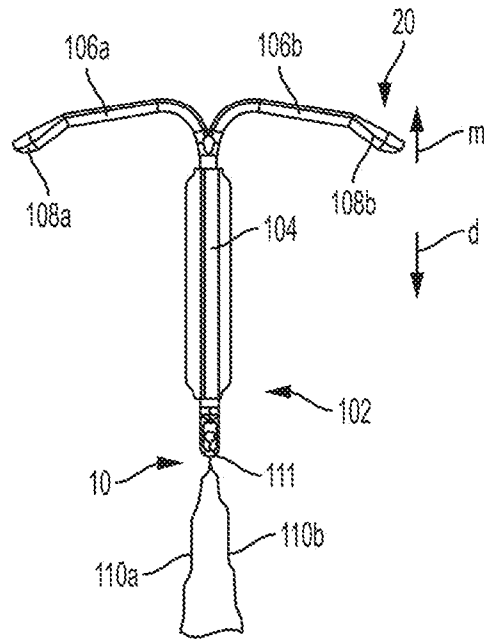


FIG. 1A  
PRIOR ART

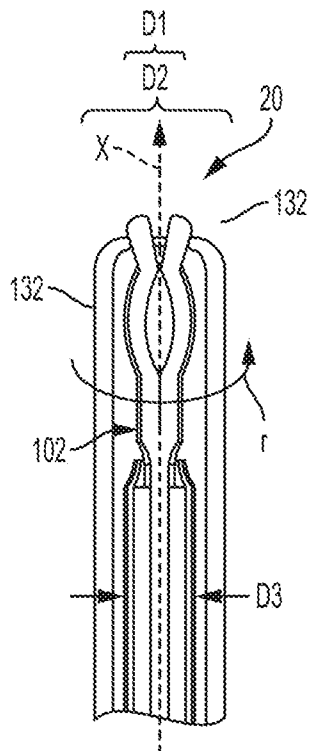


FIG. 1B  
PRIOR ART

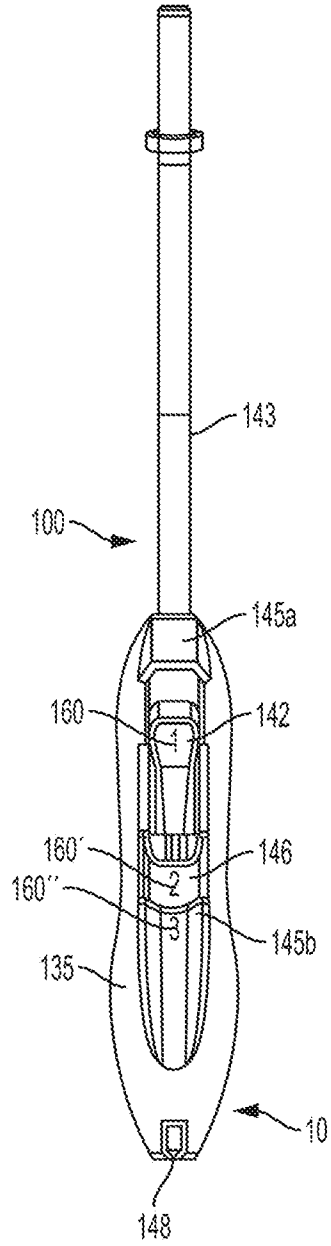


FIG. 1C  
PRIOR ART



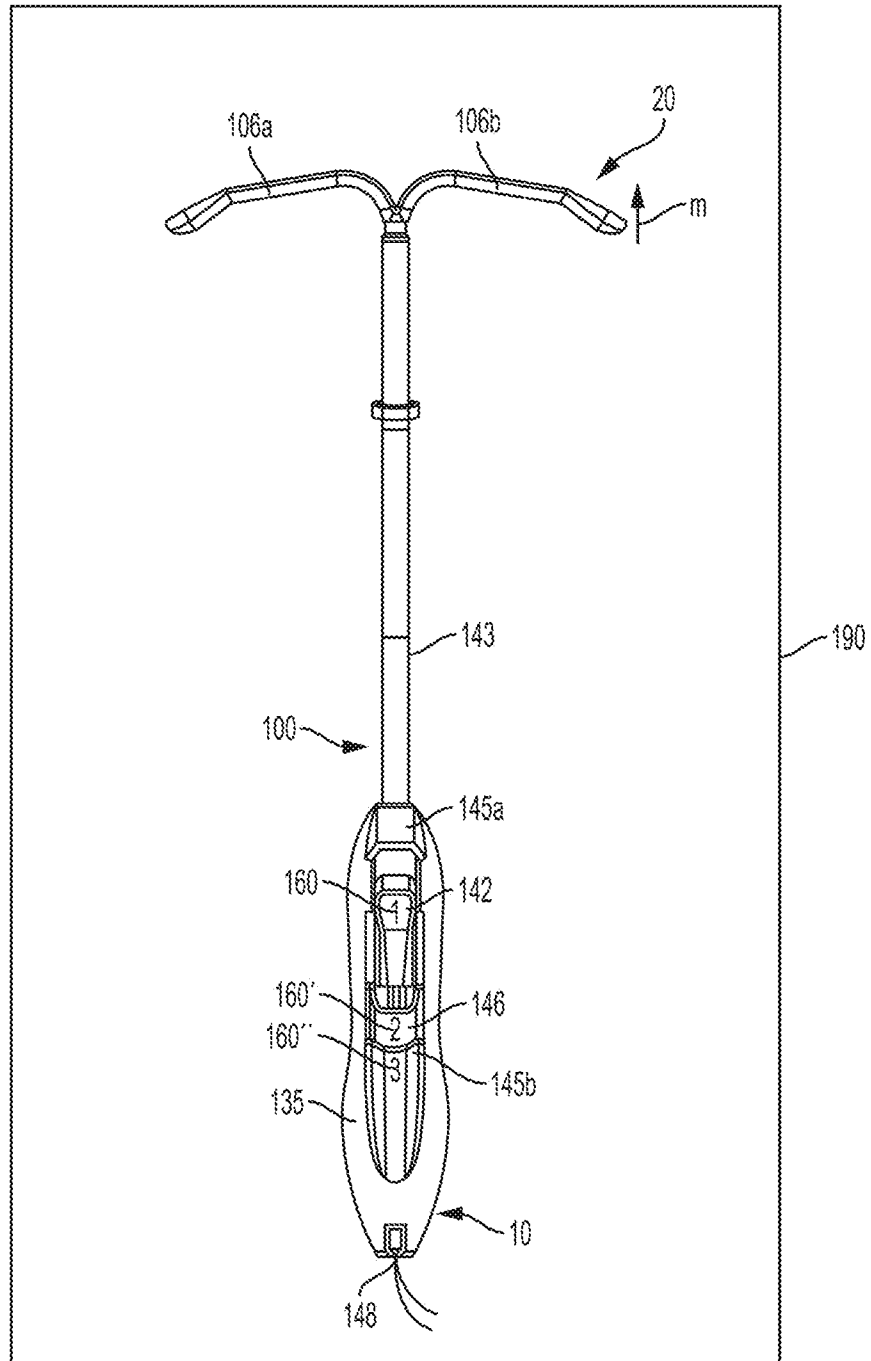


FIG. 1D  
PRIOR ART

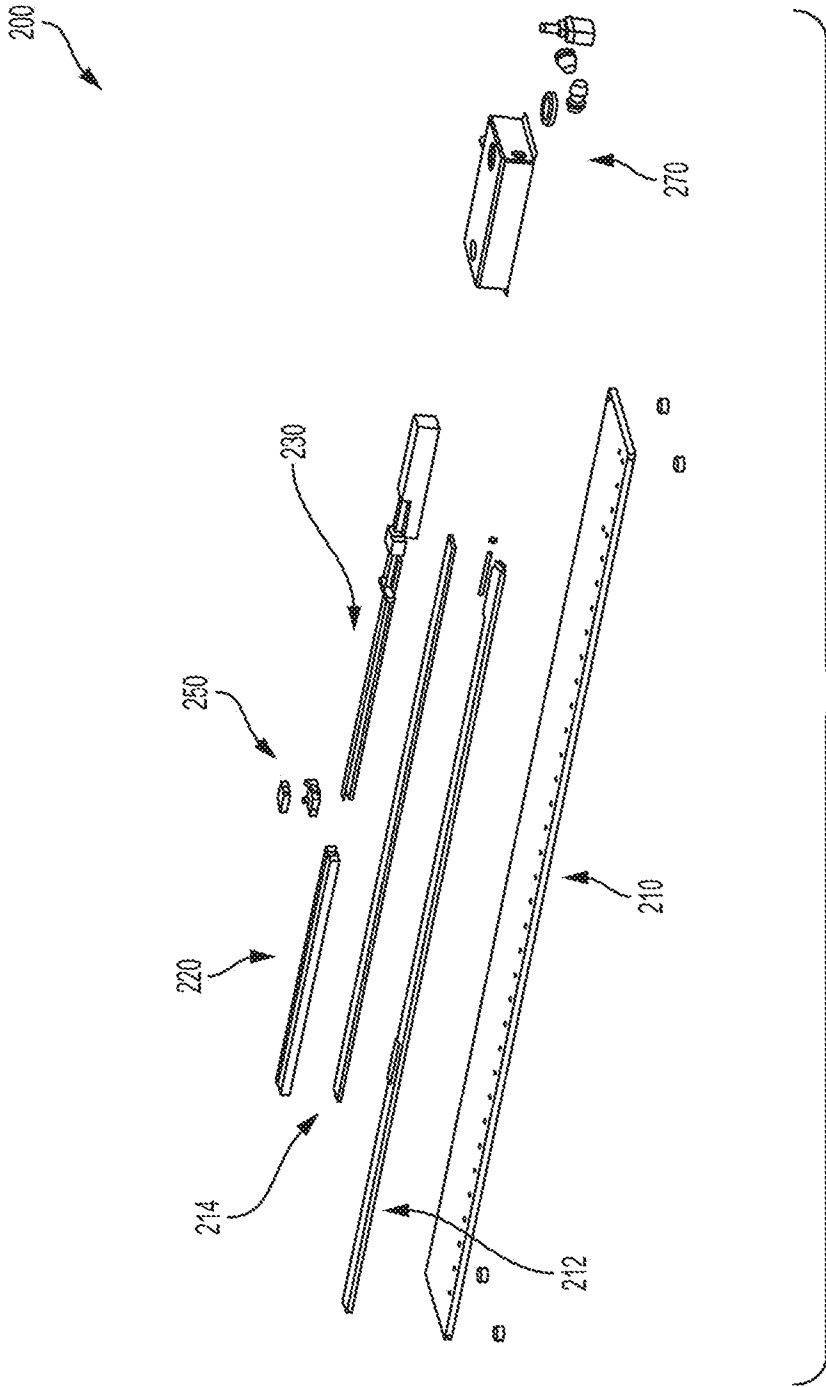


FIG. 2A

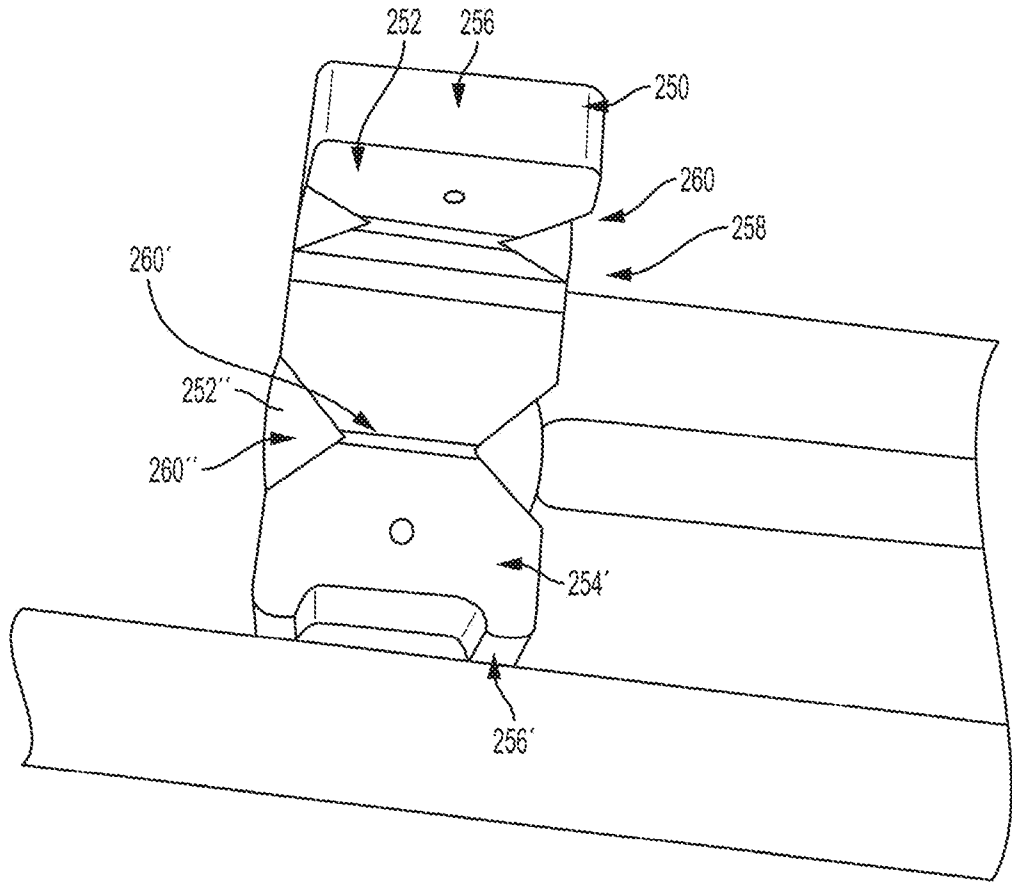


FIG. 2B

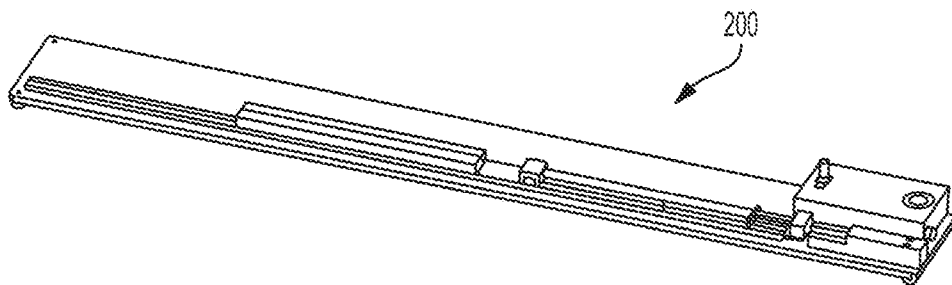


FIG. 2C

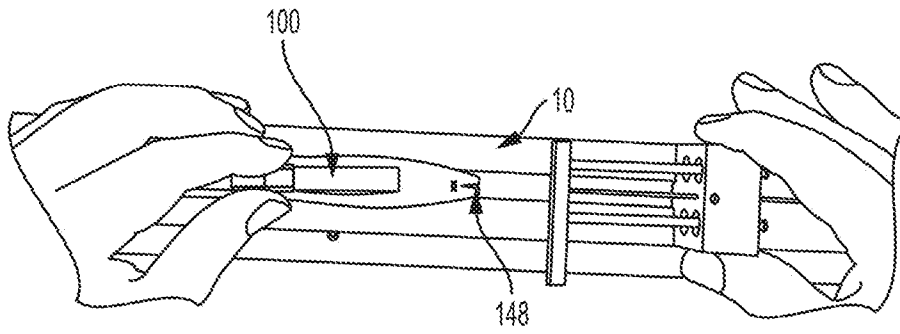


FIG. 3A

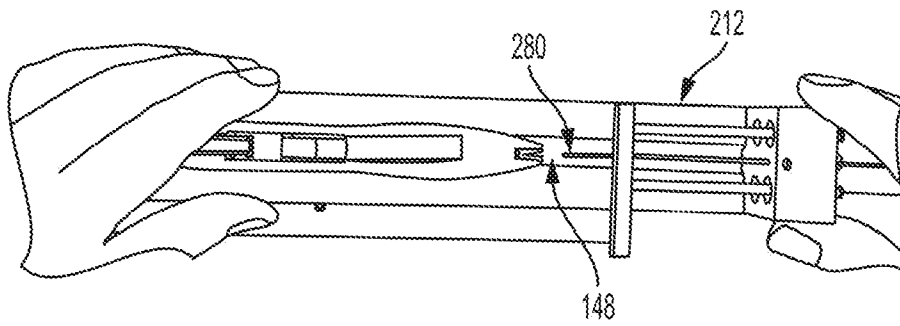


FIG. 3B

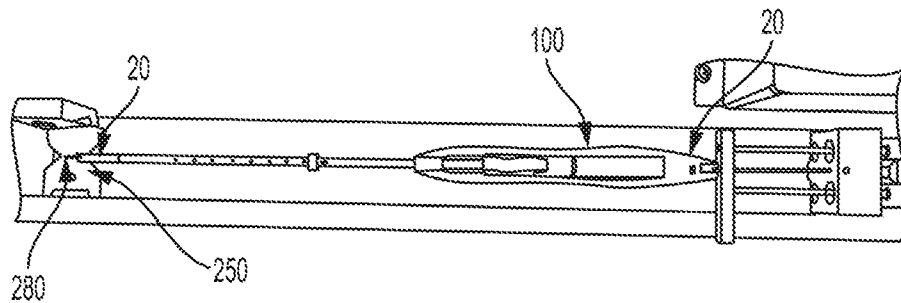


FIG. 3C

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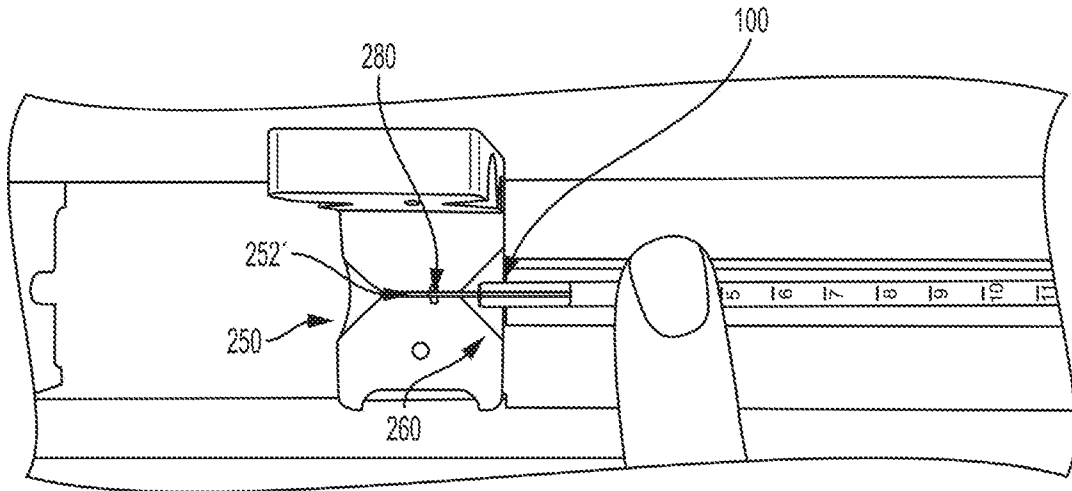


FIG. 3D

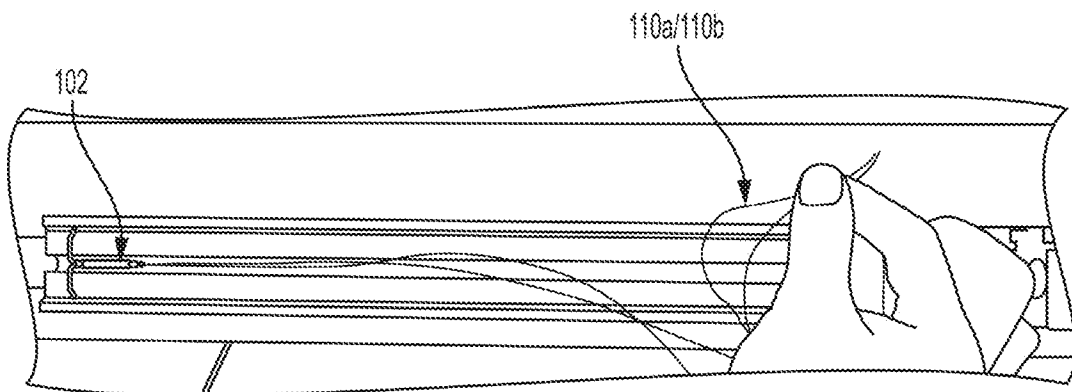


FIG. 3E

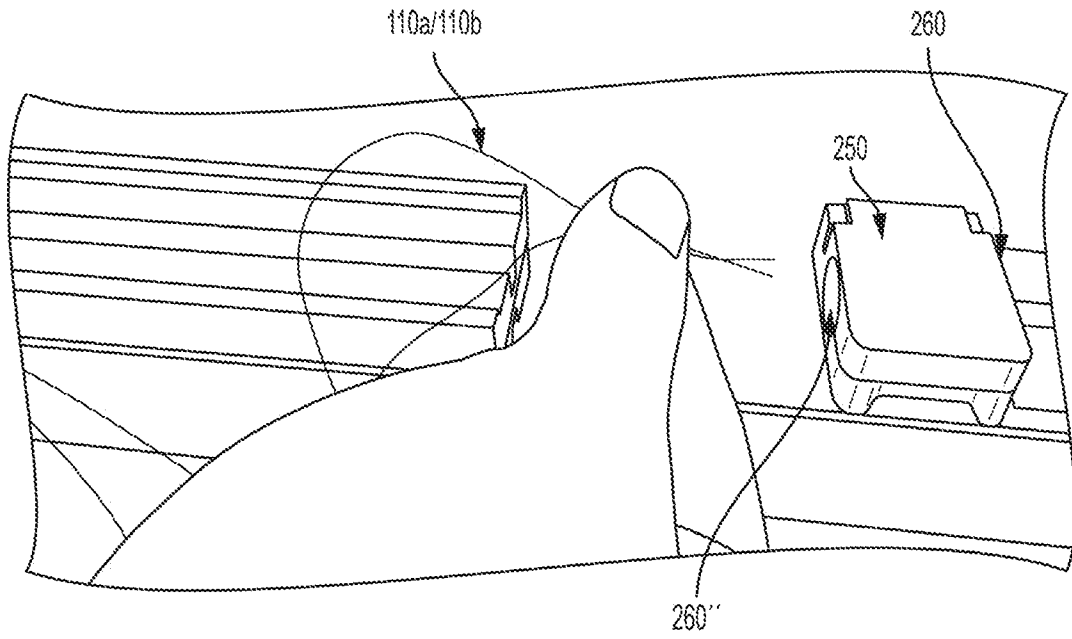


FIG. 3F

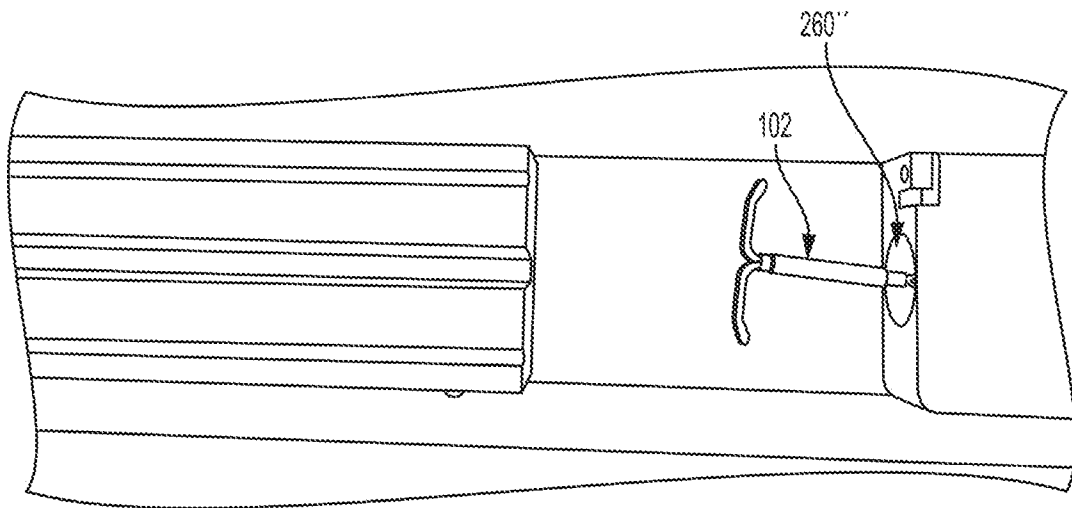


FIG. 3G

**A. CLASSIFICATION OF SUBJECT MATTER****A61F 6/18(2006.01)i**

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)  
A61F 6/18; A61F 6/06; A61K 33/34; A61F 5/46; A61F 6/14Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Korean utility models and applications for utility models  
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKOMPASS(KIPO internal) & keywords: intrauterine, IUD, slider, clamp, knot**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5370129 A (DIAZ, JUAN et al.) 6 December 1994 See abstract; column 1, line 7 - column 6, line 68; and figures 1-11.	1-23
A	US 2014-0041667 A1 (CAMMACK, SCOTT) 13 February 2014 See the whole document.	1-23
A	US 2013-0068234 A1 (PANDIT, NISHMA) 21 March 2013 See the whole document.	1-23
A	US 5842474 A (BLYSKAL, PHILIP J. et al) 1 December 1998 See the whole document.	1-23
A	US 4249525 A (KRZEMINSKI, MELVIN L.) 10 February 1981 See the whole document.	1-23
A	US 4708134 A (WILDEMEERSCH, DIRK A. A.) 24 November 1987 See the whole document.	1-23

 Further documents are listed in the continuation of Box C. See patent family annex.

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"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

24 October 2016 (24.10.2016)

Date of mailing of the international search report

**24 October 2016 (24.10.2016)**

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2016/043072**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5370129 A	06/12/1994	EP 0584628 A1	02/03/1994
US 2014-0041667 A1	13/02/2014	None	
US 2013-0068234 A1	21/03/2013	US 9265651 B2 WO 2013-042134 A1	23/02/2016 28/03/2013
US 5842474 A	01/12/1998	None	
US 4249525 A	10/02/1981	DE 3104440 A1 FR 2499404 A1 FR 2499404 B1 GB 2092449 A GB 2092449 B NL 8100616 A	21/10/1982 13/08/1982 25/04/1986 18/08/1982 07/11/1984 01/09/1982
US 4708134 A	24/11/1987	EP 0191747 A1 EP 0191747 B1 JP 61-240955 A KR 10-1992-0005718 B1	20/08/1986 18/05/1988 27/10/1986 16/07/1992