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[Continued on next page]

(54) Title: SHEATH FOR HAND-HELD AND ROBOTIC LAPAROSCOPES

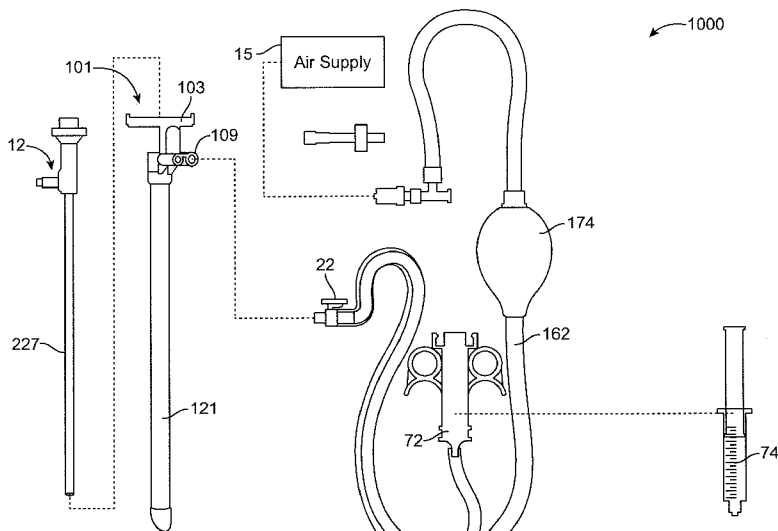


FIG. 1

(57) Abstract: A sheath for providing a dynamic air shield relative to a distal portion of a laparoscope disposed within the sheath includes a sheath elongate body having an inner surface and an outer surface, a plurality of lumens, and a distal portion configured to deflect air from the lumens across the surface of a laparoscope. The sheath can include a registration and alignment feature configured to align the sheath with a laparoscope. Further, the sheath can be configured to work with robotic laparoscope systems.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 14/43044

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61B 1/00 (2014.01)
CPC - A61B 1/126; A61B 1/127
 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)
 IPC(8) - A61B 1/00 (2014.01)
 CPC - A61B 1/126; A61B 1/127

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 USPC- 600/157, 169
 (Search term limited; see below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 PubWest (PGPB, USPT, EPAB, JPAB); Google; PatBase (All);
 Search Terms: Camera, endoscop*, laparoscop*, *scope, *scopy, clean*, clear*, debris, imager, imaging, window, lens, distal, tip, end, deflect*, redirect*, lumens, conduits, channels, passages, passageways, fluid, cleaner, air, gas, cleaning, sheath, spring, rubber band, se

C. DOCUMENTS CONSIDERED TO BE RELEVANT


Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 5,339,800 A (WIITA et al.) 23 August 1994 (23.08.1994) Entire document, especially Abstract, col 1, ln 12-17, col 1, ln 20-65, col 6, ln 44- col 7, ln 5, col 7, ln 16-36 and FIGS. 1, 9-17.	1-2, 4-15 ----- 3
Y	US 7,803,144 B1 (VOLLRATH) 28 September 2010 (28.09.2010) col 4, ln 59-63.	3
A	US 2012/0197084 A1 (DRACH et al.) 02 August 2012 (02.08.2012) Entire document.	1-15
A	US 5,464,008 A (KIM) 07 November 1995 (07.11.1995) Entire document.	1-15
A	US 5,207,213 A (AUHLL et al.) 04 May 1993 (04.05.1993) Entire document.	1-15
A	US 6,354,992 B1 (KATO) 12 March 2002 (12.03.2002) Entire document.	1-15

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"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 30 September 2014 (30.09.2014)	Date of mailing of the international search report 02 JAN 2015
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young  PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 14/43044

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.:
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:

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:

--- see continuation sheet ---

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.:
1-15

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.

---- Continuation of Box III: Observations where unity of invention is lacking (Continuation of item 3 of first sheet) -----

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-15, drawn to sheath connected to a surgical instrument, comprising an elongate sheath with plurality of lumens within the sheath wall, a deflector, stand-offs, resilient member and a connector piece, when coupled distends the resilient member to form the connection.

Group II: Claims 16-24, drawn to sheath connected to a robotically controlled surgical instrument, comprising an elongate sheath with plurality of lumens within the sheath wall, a deflector, stand-offs, and a resilient member, when coupled moves from the contracted position to an extended configuration to form the connection.

Group III: claims 25-41, drawn to sheath connected to a surgical instrument with two lenses and one or more light elements, comprising an elongate sheath with plurality of lumens within the sheath wall, a deflector, stand-offs, and an elongate window configured to expose both lenses of the surgical instrument.

Group IV: Claims 42-46, drawn a sheath system connected to a surgical instrument, comprising an elongate sheath with plurality of lumens within the sheath wall, a deflector, an attachment mechanism, gas connection port, fluid connection portion, an activation element.

Group V: Claims 47-66, drawn to methods of operating a generic dynamic air shield adjacent to surgical devices.

The inventions listed as Groups I - V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Group V describes the use of a general air shield with surgical instruments, and is not limited to any specific device. Air shields used with surgical instruments are well known in the art as exemplified by US 5,464,008 A to Kim (see Abstract, FIG. 5). Group V shares no special technical features with groups I-IV.

Groups I-IV share at least some of the following coming elements, which are known in the art to US 5,339,800 A to Wiita et al. (hereinafter: Wiita), who describes:

a sheath elongate body (200, FIG. 14) having an inner surface (wall 202, FIGS. 14-17) and an outer surface (wall 204, FIGS. 14-17) and a plurality of lumens extending between the inner surface and the outer surface (slotted passages 206, FIG. 16), the inner surface having an interior dimension selected to receive the surgical instrument (FIG. 17, col 7, ln 16-36); a distal portion of the sheath elongate body having a deflector (lens cleaning member 208, FIGS. 14-17) extending from the outer surface towards and beyond the inner surface, the deflector extending at least partially around the perimeter of the sheath elongate body (FIGS. 15, 17; col 7, ln 16-36); a deflector assembly attached to a distal end of the sheath configured to deflect fluid from the lumens over a distal end of the surgical instrument (lens cleaning member 208, FIGS. 14-17; col 7, ln 16-36); a plurality of stand-offs on the deflector sized to space a distal most portion of the surgical instrument apart from the deflector (FIG. 15, 17); an attachment mechanism (FIG. 9-12; col 6, ln 44- col 7, ln 5); and a resilient member to maintain apposition between the distal most portion of the surgical instrument and the plurality of stand-offs (flexible and resilient cam, FIG. 9-12; col 6, ln 44- col 7, ln 5).

Consequently, the groups comprise:

Group I: drawn to a connection mechanism for a sheath connected to a surgical instrument, comprising a resilient member and a connector piece, when coupled distends the resilient member to form the connection.

Group II: drawn to a connection mechanism for a sheath connected to a robotically controlled surgical instrument, comprising a resilient member, when coupled moves from the contracted position to an extended configuration to form the connection.

Group III: drawn to a surgical instrument with two lenses and one or more light elements and an elongate window configured to expose both lenses of the surgical instrument.

Group IV: drawn to a sheath system connected to a surgical instrument, comprising a gas connection port, fluid connection portion and an activation element.

Group V: Claims 47-66, drawn to methods of operating a dynamic air shield adjacent to surgical devices.

None of the groups share a technical feature with another group. Thus, unity is lacking because the groups do not share a same or corresponding special technical feature.