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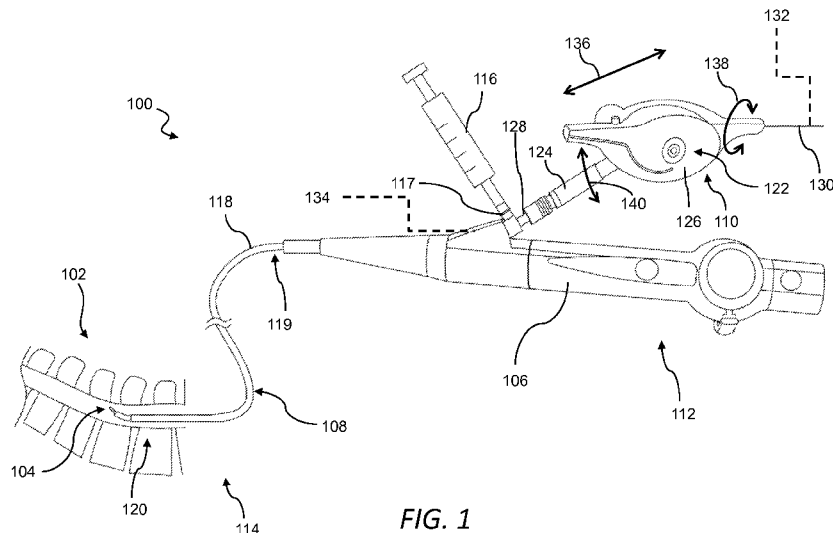
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(54) Title: STEERING TECHNIQUES FOR SURGICAL INSTRUMENTS



(57) Abstract: A steerable endoscopic tool uses concentric sleeves of varying curvature to steer a tool tip toward or in the direction of a location of surgical interest. By rotating and/or axially displacing such sleeves relative to one another the tool tip may be maneuvered within a current field of view with several degrees of freedom without any physical movement of an endoscope, thus facilitating improved surgical access and control without complex mechanical systems in the endoscope or at the surgical site.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/66861

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - A61M 25/01; A61M 25/092; A61B 17/00 (2014.01) CPC - A61M 2025/0004; A61B 2017/00331; A61B 2017/3417 According to International Patent Classification (IPC) or to both national classification and IPC</p>																													
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC: A61M 25/01, 25/092; A61B 17/00 (2014.01) CPC: A61M 2025/0004, 25/0043, 25/0067, 25/008, 24/0082, 25/01, 2025/0681, 2025/09183; A61B 1/005, 1/0051, 1/0055, 1/0056, 1/01</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, INPADOC Data; Google; Google Scholar; ProQuest; Search Terms: endoscope, catheter, cannula, tube, sleeve, steer, guide, control, prebent, preformed, precurved, curvature, bend, arcuate, stiffnes, flexibility, concentric, rotate, translate, telescope, tool, instrument, laser, illumination, fiber, camera, fluid, liquid, nitinol</p>																													
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 5,921,915 A (AZNOIAN, H. et al) 13 July 1999 (13.07.1999) figures 1, 3-7; column 2, lines 35-40; column 4, lines 60-65; column 5, lines 1-5, 50-67; column 6, lines 1-15; column 8, lines 1-5, 15-25, 40-45; column 9, lines 5-20</td> <td>1-6, 8-22</td> </tr> <tr> <td>---</td> <td></td> <td>---</td> </tr> <tr> <td>Y</td> <td>US 2010/0022824 A1 (CYBULSKI, J. et al) 28 January 2010 (28.01.2010) figure 6D; paragraphs [0065], [0066], [0071]</td> <td>7</td> </tr> <tr> <td>Y</td> <td>US 2010/0022824 A1 (CYBULSKI, J. et al) 28 January 2010 (28.01.2010) figure 6D; paragraphs [0065], [0066], [0071]</td> <td>7</td> </tr> <tr> <td>A</td> <td>US 5,607,435 A (SACHDEVA, R. et al) 4 March 1997 (04.03.1997) entire document</td> <td>1-22</td> </tr> <tr> <td>A</td> <td>US 7,914,517 B2 (BARAN, G. et al) 29 March 2011 (29.03.2011) entire document</td> <td>1-22</td> </tr> <tr> <td>A</td> <td>US 6,572,593 B1 (DAUM, W.) 3 June 2003 (03.06.2003) entire document</td> <td>1-22</td> </tr> <tr> <td>A</td> <td>US 5,318,528 A (HEAVEN, M. et al) 7 June 1994 (07.06.1994) entire document</td> <td>1-22</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 5,921,915 A (AZNOIAN, H. et al) 13 July 1999 (13.07.1999) figures 1, 3-7; column 2, lines 35-40; column 4, lines 60-65; column 5, lines 1-5, 50-67; column 6, lines 1-15; column 8, lines 1-5, 15-25, 40-45; column 9, lines 5-20	1-6, 8-22	---		---	Y	US 2010/0022824 A1 (CYBULSKI, J. et al) 28 January 2010 (28.01.2010) figure 6D; paragraphs [0065], [0066], [0071]	7	Y	US 2010/0022824 A1 (CYBULSKI, J. et al) 28 January 2010 (28.01.2010) figure 6D; paragraphs [0065], [0066], [0071]	7	A	US 5,607,435 A (SACHDEVA, R. et al) 4 March 1997 (04.03.1997) entire document	1-22	A	US 7,914,517 B2 (BARAN, G. et al) 29 March 2011 (29.03.2011) entire document	1-22	A	US 6,572,593 B1 (DAUM, W.) 3 June 2003 (03.06.2003) entire document	1-22	A	US 5,318,528 A (HEAVEN, M. et al) 7 June 1994 (07.06.1994) entire document	1-22
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<p>Date of the actual completion of the international search</p> <p>26 February 2015 (26.02.2015)</p>		<p>Date of mailing of the international search report</p> <p>22 MAY 2015</p>																											
<p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201</p>		<p>Authorized officer:</p> <p>Shane Thomas</p> <p>PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</p>																											