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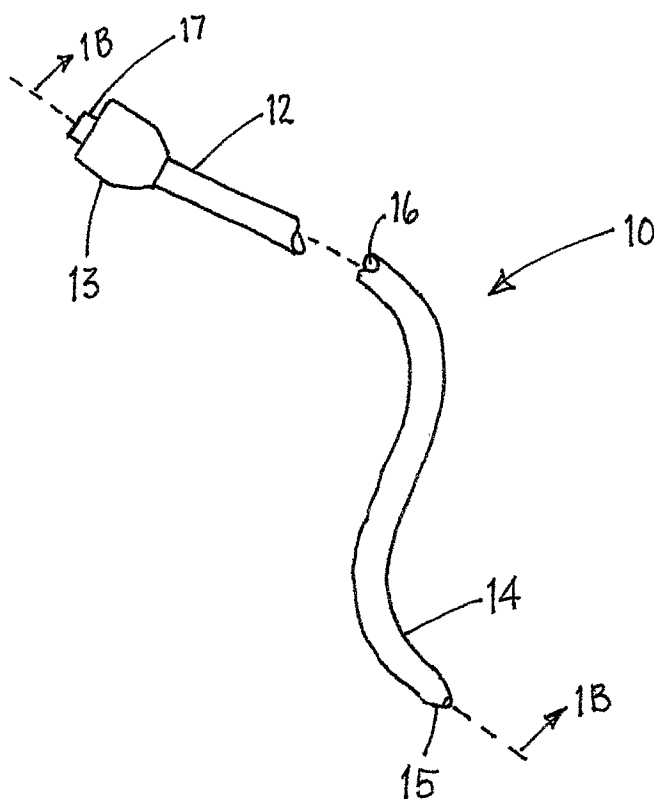
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[Continued on next page]

(54) Title: CATHETERS WITH LUBRICIOUS LININGS AND METHODS FOR THEM



(57) Abstract: A method for making a tubular device includes coating a first surface of a thin sheet, rolling the sheet such that side edges of the sheet are disposed adjacent one another with the coating disposed inwardly, creating a longitudinal seam along the side edges to create a sleeve, and attaching a tubular structure around the sleeve. In another embodiment, the method includes coating a first surface of a thin sheet, wrapping the sheet partially around a mandrel with the coating disposed inwardly, positioning a slotted tube around the sheet and mandrel, attaching the tube to the thin, and trimming any excess material of the sheet. In another embodiment, the method includes coating an outer surface of a thin sleeve, inverting the sleeve, and attaching a tubular structure around the inverted sleeve, thereby providing a tubular device including a lubricious, hydrophilic, and/or otherwise coated inner surface.

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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*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M25/00 A61N1/04 B29C63/00 B29C53/38

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)
A61M B29C A61N A61L

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 practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/51370 A (RTC INC [US]; BIGONZI JAKER ANNA MARIA [US]; JAKER MARC L [US]) 19 November 1998 (1998-11-19)	1, 3, 5, 9, 25, 28-32, 37, 39-41, 44-46
Y	the whole document	4, 8, 10-12, 26, 27, 35, 36, 47, 48
A	----- US 5 217 440 A (FRASSICA JAMES J [US]) 8 June 1993 (1993-06-08) cited in the application	1, 25, 29
Y	column 5, line 7 - column 8, line 33; figures 3-11 -----	8, 26, 27, 35, 36, 47, 48
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *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)
- *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

- *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
- *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
- *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.
- *&* document member of the same patent family

Date of the actual completion of the international search

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23/05/2007

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01/07101 A (TFX MEDICAL EXTRUSION PRODUCTS [US]) 1 February 2001 (2001-02-01)	4,10-12
A	page 10, line 25 - page 11, line 16	1,3,5
A	US 6 837 890 B1 (CHLUDZINSKI MATT [US] ET AL) 4 January 2005 (2005-01-04) cited in the application column 6, lines 46-66; figures 1,2	1,4,5, 10-12, 25,28,29
A	WO 2004/075961 A (MEDTRONIC INC [US]; TUOMINEN SCOTT N [US]) 10 September 2004 (2004-09-10) the whole document	1,3,5,6, 25,29,39
A	WO 91/13648 A (GORE & ASS [US]) 19 September 1991 (1991-09-19) the whole document	1,25,29
A	US 5 735 809 A (GORSUCH REYNOLDS [US]) 7 April 1998 (1998-04-07) column 4, line 66 - column 5, line 59; figures 8,9	1,25,29

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/039074

Box 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.: 2
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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 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 additional 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 an additional fee, this Authority did not invite payment of any additional fee.

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.:

see annex

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 2

Claim 2 refers to first and second layers but there are no layers defined in independent claim 1.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 3-12, 25-48

A method for making a tubular device sized for introduction into a body lumen, comprising providing a thin sheet comprising first and second side edges; coating a first surface of the thin sheet with a coating having one or more desired properties, rolling the thin sheet such that the first and second side edges are disposed adjacent one another and the coating is disposed inwardly; creating a longitudinal seam along the first and second side edge to create a sleeve and attaching a tubular structure around the sleeve;
and other methods.

2. claims: 13-24

A method for making a tubular device sized for introduction into a body lumen, comprising;
coating a first surface of a thin sheet with a coating imparting one or more desired properties to the surface;
wrapping the thin sheet at least partially around a mandrel with the first surface disposed inwardly;
positioning a slotted tube around the thin sheet and mandrel;
attaching the slotted tube to the thin sheet to form a tubular structure;
and removing the tubular structure from the mandrel.

3. claims: 49-63

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A tubular device, comprising a proximal end, a distal end sized for introduction into a body lumen, and a lumen extending between the proximal and distal ends, the tubular device comprising:

an inner polyurethane liner comprising a coating on an inner surface thereof, the coating imparting one or more predetermined properties to a wall of the lumen, the liner having a thickness between about 0.0001-0.01 inch (0.0025-0.25 mm);

a braid surrounding at least a portion of the liner; and

an outer layer surrounding the braid and liner;

and a tubular device, comprising a proximal end, a distal end sized for introduction into a body lumen, and a lumen extending between the proximal and distal ends, the tubular device comprising:

an inner polyurethane liner comprising a coating on an inner surface thereof, the coating imparting one or more predetermined properties to a wall of the lumen, the liner having a thickness between about 0.0001-0.01 inch (0.0025-0.25 mm); and an outer layer comprising at least one of nylon, urethane, and PEBAX.

4. claims: 64-72

A lead comprising a proximal end, a distal end sized for introduction into a body lumen and at least one electrode on the distal end, the lead comprising:

a lead body comprising at least one of silicone and polyurethane and including an outer surface extending between the proximal and distal ends; and

a polyurethane cover surrounding at least a portion of the outer surface, the cover comprising a coating imparting one or more predetermined properties to the portion of the outer surface.

5. claims: 73-75

A tubular structure for lining an interior of an elongate medical device, comprising at least one polyurethane sheet formed into a tube comprising a proximal end, a distal end, a lumen extending between the proximal and distal ends, and at least one longitudinal seam extending between the proximal and distal ends, the tube having a wall thickness between about 0.0001-0.003 inch, the lumen having a diameter between about 0.40-5 millimeters; and a coating on an interior of the lumen, the coating comprising at least one of a lubricious material and a hydrophilic material; and an elongate medical device.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2006/039074

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