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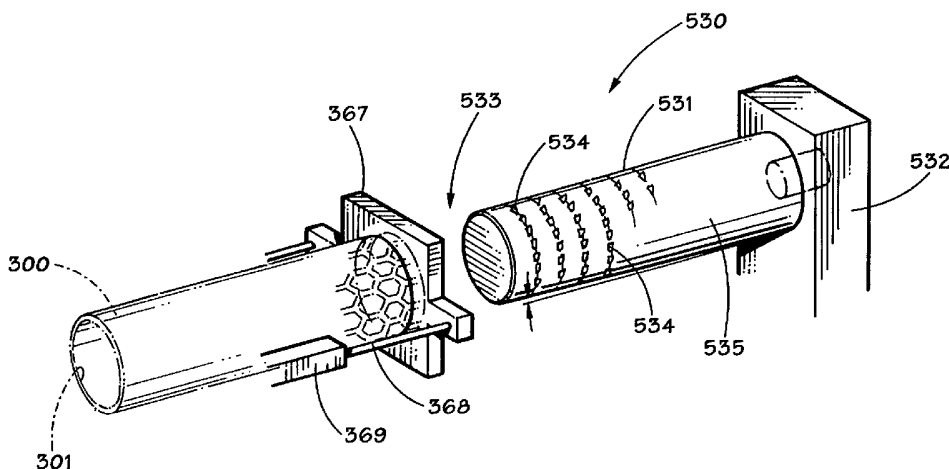
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- (74) Agent: **TOBOR, Ben, D.**; Bracewell & Patterson, L.L.P., P.O. Box 61389, Houston, TX 77208-1389 (US).
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHODS AND APPARATUS FOR MANUFACTURING AN INTRAVASCULAR STENT



(57) Abstract: The invention relates to methods and apparatus for manufacturing intravascular stents wherein the intravascular stent has its inner surface treated to promote the migration of endothelial cells onto the inner surface of the intravascular stent. In particular, the inner surface of the intravascular stent has at least one groove formed therein.



WO 01/089420 A3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/16374

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 A61F2/06 C23F1/04 B23H9/00

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 7 A61F C23F B21D B23H

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 23977 A (EXPANDABLE GRAFTS PARTNERSHIP) 20 May 1999 (1999-05-20) page 6, line 26 -page 8, line 20; claims; figures	15
A	---	1,23
P,X	WO 01 00112 A (ADVANCED CARDIOVASCULAR SYSTEM) 4 January 2001 (2001-01-04) page 16, line 14 - line 26; figures 20,21B	15
A	US 5 772 864 A (MOLLER PER ET AL) 30 June 1998 (1998-06-30) the whole document	1,3,23, 25
A	WO 00 10623 A (TRICARDIA L L C) 2 March 2000 (2000-03-02) page 11, line 4 - line 13; claims 1-11; figures	1

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Further documents are listed in the continuation of box C.



Patent family members are listed in 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.
- *Z* document member of the same patent family

Date of the actual completion of the international search

5 February 2003

Date of mailing of the international search report

13. 02. 2003

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/16374

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 425 696 A (TORNIAINEN MATTI J) 17 January 1984 (1984-01-17) claims; figures ---	1,4,7, 25,26
A	US 4 437 327 A (MADDEN JAMES A) 20 March 1984 (1984-03-20) claims; figures ---	1,8,9, 25,31,32
A	US 5 855 802 A (HALL RICHARD RONALD ET AL) 5 January 1999 (1999-01-05) the whole document ---	15,16, 19-22
A	EP 0 734 699 A (ADVANCED CARDIOVASCULAR SYSTEM) 2 October 1996 (1996-10-02) claims; figures ---	15,16,19
A	WO 99 61261 A (BMC IND INC) 2 December 1999 (1999-12-02) the whole document ---	15,16,19
A	EP 0 850 604 A (SORIN BIOMEDICA SPA) 1 July 1998 (1998-07-01) column 5, line 47 - line 58; figure 6 ---	15,16
A	EP 0 974 314 A (ADVANCED CARDIOVASCULAR SYSTEM) 26 January 2000 (2000-01-26) paragraph '0041! - paragraph '0042!; figures ---	15,23
A	US 4 100 388 A (MEYER GILBERT) 11 July 1978 (1978-07-11) column 1, line 6 - line 49; figure 2 -----	23,24

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/16374

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

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

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

1. Claims: 1-14,25-36

A method of forming a groove in the inner surface of a metallic intravascular stent by disposing a mandrel having a raised pattern on its outer surface into the stent and using mechanical force to impart the groove

1.1. Claims: 1,4,25,26

the mechanical force is provided by a calendaring roller against the outer surface of the stent

1.2. Claims: 1,5,6,25,27,28

the mechanical force is provided by a stamping apparatus which is forced against the outer surface of the stent

1.3. Claims: 1,7,25,29,30

the mechanical force is provided by an impression roller rotating inside the stent to impart a groove from a pattern from the outer surface of the roller to the inner surface of the stent

2. Claims: 15-22

A method of forming a groove in the inner surface of a metallic intravascular stent by etching the inner surface with a chemical process

3. Claims: 23,24

A method of forming a groove in the inner surface of a metallic intravascular stent by electric discharge machining

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

Information on patent family members

International Application No

PCT/US 01/16374

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/16374

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