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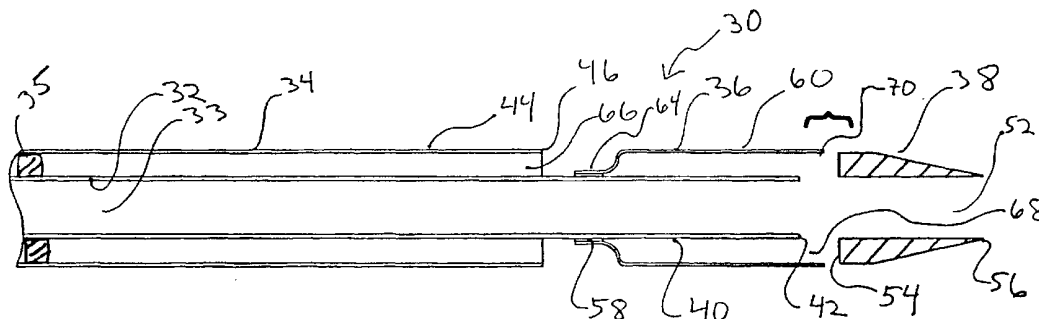
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A61M 25/00
- (21) International Application Number: PCT/US00/28657 (74) Agents: **CROMPTON, David, M.** et al.: Crompton, Seager & Tuft, LLC, Suite 895, 331 Second Avenue South, Minneapolis, MN 55401-2246 (US).
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- (30) Priority Data:  
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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: METHOD FOR LOADING A STENT ONTO A CATHETER, CATHETER TIP DESIGNS AND METHOD OF MANUFACTURE



(57) Abstract: Methods for making a loaded catheter assembly for delivering a self-expanding stent where the self-expanding stent is carried in a compressed state and the compressed stent has an inside diameter smaller than the outside diameter of the catheter distal tip. The methods can utilize catheter sub-assemblies lacking already attached tips or having partially formed distal tips. A stent can be proximally and co-axially slid over the distal end of the catheter shaft and constrained by a retractable sheath disposed co-axially about the compressed stent. The catheter distal tip can be added or more fully formed after the loading of the stent. Some catheters include a preformed distal conical tip held in position by a heat-shrink film. Other catheters have an elastomeric distal tip waist for slipping over and engaging an outward projection on the catheter shaft distal region. Some catheters are adapted to engage catheter shaft distal threaded regions.



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**INTERNATIONAL SEARCH REPORT**

International Application No  
PCT/US 00/28657

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61F2/06 A61M25/00

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 A61M A61F

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	EP 0 941 713 A (SCHNEIDER EUROPA GMBH) 15 September 1999 (1999-09-15) abstract; figure 4	1,2
X	US 5 919 204 A (HOFMANN ET AL.) 6 July 1999 (1999-07-06) abstract; figures 1-3	1,2

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

Date of the actual completion of the international search

16 January 2001

Date of mailing of the international search report

27.04.2001

Name and mailing address of the ISA

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Authorized officer

Michels, N

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 00/28657

## 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.:

1,2

### 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: 1,2

A method for assembling a catheter having a shaft, a tip, a self-expandable stent, a retractable sheath and means for securing the tip to the shaft

1.1. Claims: 3-10,24-27,44

Method for assembling a catheter and a catheter having a shaft, a self-expandable stent, a retractable sheath, a tip, a shrinkable film for securing the tip to the shaft

1.2. Claims: 12-23,44

Method for assembling a catheter and acatheter having a tip, a self-expandable stent, a retractable sheath and a shaft with at least one protrusion at the distal end for securing the tip to the shaft

1.3. Claims: 30-35

Method for assembling a catheter and a catheter having a tip, a self-expandable stent, a retractable sheath and a shaft with a tread at the distal end for securing the tip to the shaft

1.4. Claims: 36-38

Method for assembling a catheter and a catheter having a self-expandable stent, a retractable sheath, a shaft and a radially compressible tip for securing the tip to the shaft

1.5. Claims: 39-43,46

Method for assembling a catheter and a catheter having a self-expandable stent, a retractable sheath, a shaft and a swollen tip for securing the top to the shaft

2. Claims: 3-10,24-27,44Independent Claims

A method for assembling a catheter and a catheter having a self-expandable stent, a retractable sheath, a shaft, a tip and a shrinkable film for securing the tip to the shaft

3. Claims: 12-23,45

A method for assembling a catheter and a catheter having a self-expandable stent, a retractable sheath, a tip and a

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

shaft with at least one projection at the distal end for securing the tip to the shaft

4. Claims: 30-35

A method for assembling a catheter and a catheter having a self-expandable stent, a retractable sheath, a tip and a shaft with a threaded distal end for securing the tip to the shaft

5. Claims: 36-38

A method for assembling a catheter and a catheter having a self-expandable stent, a retractable sheath, a shaft and a radially compressible tip for securing the tip to the shaft

6. Claims: 11,28,29

A catheter having a self-expandable stent, a retractable sheath, a tip and shaft, wherein the diameters of the distal portions are determined

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.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/28657

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