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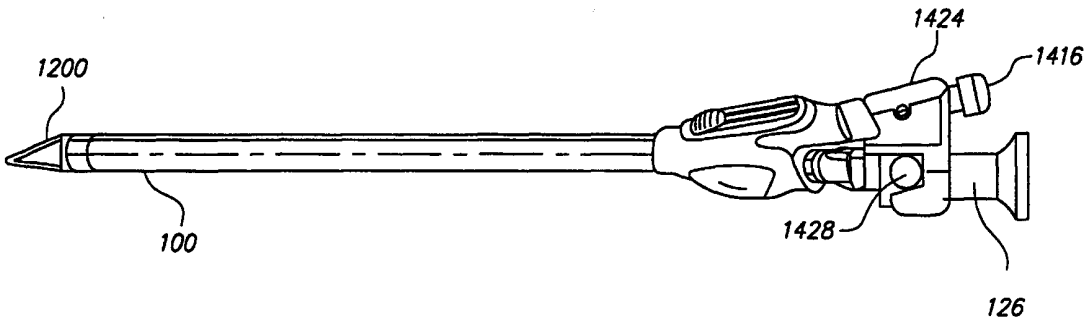
(54) Title: COMBINED VESSEL DISSECTION AND TRANSECTION DEVICE AND METHOD



(57) Abstract

A retractor and a surgical tool are positioned within a cannula, and a dissection cradle of the retractor is positioned at the distal end of the cannula. The retractor includes a first portion with an axis approximately parallel to the axis of the cannula and a second portion with an axis skewed relative to the axis of the cannula. The dissection cradle is located at the distal end of the second portion of the retractor, and may include two substantially parallel, spaced legs with the retractor shaped in a loop between and in a plane skewed relative to the axes of the legs, and with the loop directed away from the surgical tool. Thus, in operation, when the surgeon locates a vessel and side branch of interest, the surgeon extends the retractor to cradle the vessel in the dissection cradle. Once cradled, the retractor may be fully extended to urge the vessel away from the axis of the cannula to isolate the side branch for exposure to the surgical tool. Removable, transparent tips are selectively positioned at the distal end of the cannula for performing dissection and transection via a single cannula. Additionally, the tips are configured to align the apices of the tips with the central axis of the endoscope to maximize the visual field through the tips via the endoscope. Wing–like protrusions on an alternate tip for the cannula facilitate tissue dissection in forming a tunnel in tissue along a target vessel. Swept back forward edges on the wing–like protrusions promote easy tissue dissection using reduced force to advance the cannula and alternate tip through tissue surrounding the target vessel.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/31242

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/32

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 A61B

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 761 171 A (OLYMPUS) 12 March 1997 (1997-03-12) column 49, last paragraph; figures 4,80,81	1-8
A	WO 97 26831 A (ORIGIN) 31 July 1997 (1997-07-31) figure 1	1
A	US 5 569 183 A (KIETURAKIS) 29 October 1996 (1996-10-29) column 4, paragraphs 1-4; figure 1	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

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"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	Date of mailing of the international search report
10 May 2000	22. 08. 2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	BARTON, S

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int tional application No.
PCT/US 99/31242

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. [X] Claims Nos.: 13-16
because they relate to subject matter not required to be searched by this Authority, namely:

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery

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. [X] 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.:

1-8

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

1. Claims: 1-8

Excentric transparent dissecting tip

2. Claims: 9-12

Dilating tip with wing-like protrusions

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 99/31242

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