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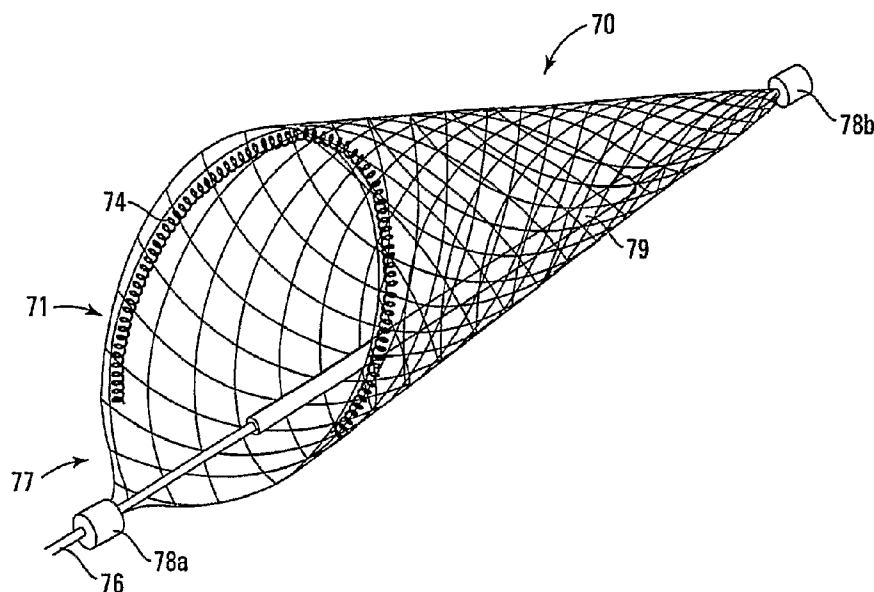
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[Continued on next page]

(54) Title: EMBOLIC PROTECTION DEVICES HAVING RADIOPAQUE MARKERS



(57) Abstract: A device for filtering emboli from blood flowing through a lumen defined by the walls of a vessel in a patient's body, comprising: a filter element being expandable from a collapsed configuration when the filter element is restrained to an expanded configuration when the filter element is unrestrained, and an elongate support member, the filter being carried on a portion of the elongate support member, wherein the filter element has proximal and distal portions and a central portion, the filter element having a shape in the expanded configuration which defines a cavity having a proximal facing opening, and wherein the proximal portion of the filter element comprises a radiopaque element in the form of a discontinuous loop extending around a portion of a perimeter of the proximal facing opening, the discontinuous loop having a gap and the gap being proximate to the elongate support member.

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INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. A61F2/01

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)

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, 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	US 2005/131449 A1 (SALAHIEH AMR [US] ET AL) 16 June 2005 (2005-06-16)	1-4, 6-17,22, 36-39, 41,43-45
Y	paragraphs [0059] - [0064], [0083] - [0085], [0101], [0102]; figures 1,9-12,29-32	5,40
Y	US 2004/167567 A1 (CANO GERALD G [US] ET AL) 26 August 2004 (2004-08-26) pages 1A-1C,2, paragraphs 57,58,66,83,84,86,88	5,40
X	WO 2004/030574 A (ADVANCED CARDIOVASCULAR SYSTEM [US]) 15 April 2004 (2004-04-15) page 23, line 10 - page 24, line 6; figures 13-16	1-4
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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
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- *&* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

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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.
X	US 2002/188314 A1 (ANDERSON KENT D [US] ET AL) 12 December 2002 (2002-12-12) paragraphs [0034] - [0037], [0040] - [0044], [0047] - [0051], [0055] - [0060]; figures 1-6 -----	1-4
A	US 2004/204737 A1 (BOISMIER DENNIS A [US] ET AL) 14 October 2004 (2004-10-14) paragraphs [0013] - [0016], [0019]; figures 1-3 -----	1-17, 22, 36-41, 43-45

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/007733

Box No. 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.: 48
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 No. 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 allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ 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: 1-17,22,36-41,43-45

An embolic filtering device comprising an expandable filter element carried on an elongate support member. The filter defines a cavity with a proximal facing opening. A radiopaque element in the form of a discontinuous loop segment extends around a portion of the perimeter of the proximal facing opening of the filter. The filter comprises a mesh and the radiopaque element is interwoven into the mesh.

2. claims: 18,19,23

An embolic filtering device comprising an expandable filter element carried on an elongate support member. The filter defines a cavity with a proximal facing opening. A radiopaque element in the form of a discontinuous loop segment extends around a portion of the perimeter of the proximal facing opening of the filter. The radiopaque element comprises a tang.

3. claims: 20, 21, 24-26, 28-30, 32, 33, 42

An embolic filtering device comprising an expandable filter element carried on an elongate support member. The filter defines a cavity with a proximal facing opening. A radiopaque element in the form of a discontinuous loop segment extends around a portion of the perimeter of the proximal facing opening of the filter. The filter comprises a mesh and the radiopaque element is attached to the mesh via securing elements, such as bands, wire loops and/or knotted strands, that pierce through and encircle a portion of the mesh.

4. claims: 27,31

An embolic filtering device comprising an expandable filter element carried on an elongate support member. The filter defines a cavity with a proximal facing opening. A radiopaque element in the form of a discontinuous loop segment extends around a portion of the perimeter of the proximal facing opening of the filter. An end portion of the radiopaque element is embedded in a protective mass.

5. claims: 34,35

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

An embolic filtering device comprising an expandable filter element carried on an elongate support member. The filter defines a cavity with a proximal facing opening. A plurality of radiopaque marker elements, such as beads or bands, are attached to the proximal portion of the filter.

6. claims: 46,47

An embolic filtering device comprising an expandable filter element carried on an elongate support member. The filter defines a cavity with a proximal facing opening. The filter is attached to proximal and distal slidable markers and the elongate support member comprises a connector that limits the movement of the markers and enhances the flexibility of the device.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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