

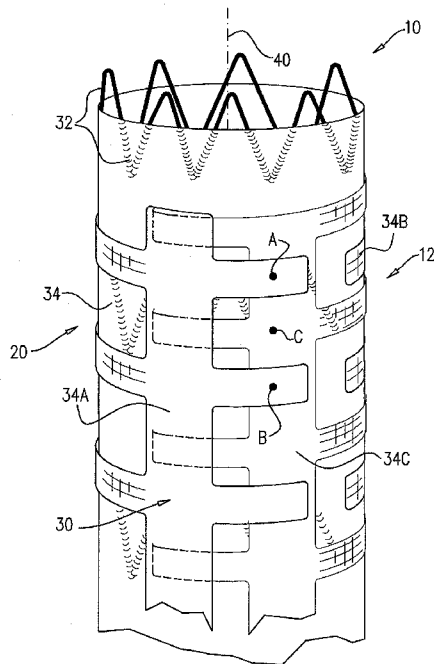


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[Continued on next page]

- (54) Title: IMPLANTABLE MEDICAL DEVICES CONSTRUCTED OF SHAPE MEMORY MATERIAL

FIG. 1A



(57) Abstract: Medical apparatus (100) is provided for insertion into a mammalian body. The apparatus (100) includes structural stent elements (110), at least a portion of which are shaped so as to define (a) at least one generally circumferential band (112), and (b) a plurality of engagement members (114) that are joined to and extend radially inwardly from the band (112). The apparatus (100) further includes an elongated latch member (118) which is threaded through the engagement members (114), thereby physically latching the engagement members (114). The band (112) and the engagement members (114) are configured such that (a) when the latch member (118) is threaded through and thus physically latches the engagement members (114), the engagement members (114) retain the band (112) in a radially-compressed state, and (b) when the latch member (118) is removed from the engagement members (114), the band (112) assumes a radially-expanded state. Other embodiments are also described.

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22 November 2012

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL12/00060

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61F 2/06 (2012.01)

USPC - 623/1.17, 1.12, 1.27

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(8): A61F 2/06 (2012.01)

USPC: 623/1.17, 1.12, 1.27

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 practicable, search terms used)

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); DialogPRO; IEEE; Google; Google Scholar; Medline: stent*, ring*, loop*, hoop*, engag*, member*, guid*, wir*, blood, filter*, extend, extends, extending, expand, expands, expanding, inward*

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5549662 A1 (FORDENBACHER, PJ) August 27, 1996, column 5, lines 26-67; figures 1-3	1-35
A	US 7803178 B2 (WHIRLEY, RG et al.) September 28, 2010, figure 1; column 8, lines 6-37; column 10, lines 35-59.	1-35
P, Y	US 8080053 B2 (SATASIYA, P et al.) December 20, 2011, figure 1; column 4, lines 30-53	1-35
A	US 2001/0044651 A1 (STEINKE, TA et al.) November 22, 2001, figure 10; paragraph [0067]	1-35
A	US 2002/0040236 A1 (LAU, L et al.) April 4, 2002, figure 2; paragraph [0093]	1-35
A	US 2003/0040791 A1 (OKTAY, H) February 27, 2003, figure 1; paragraph [0057]	1-35
A	US 2005/0154448 A1 (CULLY, E et al.) July 14, 2005, figure 1; paragraph [0025]	1-35
A	US 2008/0300665 A1 (LOOTZ, D et al.) December 4, 2008, figures 1-5; paragraphs [0040]-[0043]	1-35
A	US 2009/0227997 A1 (WANG, X et al.) September 10, 2009, figure 1; paragraph [0042]	1-35

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

* 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 application or patent 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

24 July 2012 (24.07.2012)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL12/00060

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.:
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 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:

Group I: Claims 1-35 are directed toward a medical apparatus for insertion into a mammalian body, the apparatus comprising: structural stent elements, at least a portion of which are shaped so as to define: at least one generally circumferential band, and a plurality of engagement members that are joined to and extend radially inwardly from the band; and an elongated latch member which is threaded through the engagement members, thereby physically latching the engagement members, wherein the band and the engagement members are configured such that: when the latch member is threaded through and thus physically latches the engagement members, the engagement members retain the band in a radially-compressed state, and when the latch member is removed from the engagement members, the band assumes a radially-expanded state.

Group II: Claims 36-70 are directed toward a medical apparatus for insertion into a mammalian body, the apparatus comprising: structural stent elements, at least a portion of which define a stent body that is configured to assume radially-compressed and radially-expanded states; and a restraining member, in which at least a portion of the stent body is disposed in the radially-compressed state, and which restraining member is configured to assume at least: a first rotational state, in which the restraining member restrains at least a portion of the stent body in the radially-compressed state, and a second rotational state.

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 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.:
Claims 1-35

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.