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[Continued on next page]

(54) Title: COLLAPSIBLE/EXPANDABLE PROSTHETIC HEART VALVES WITH NON-EXPANDING STENT POSTS AND RETRIEVAL FEATURES

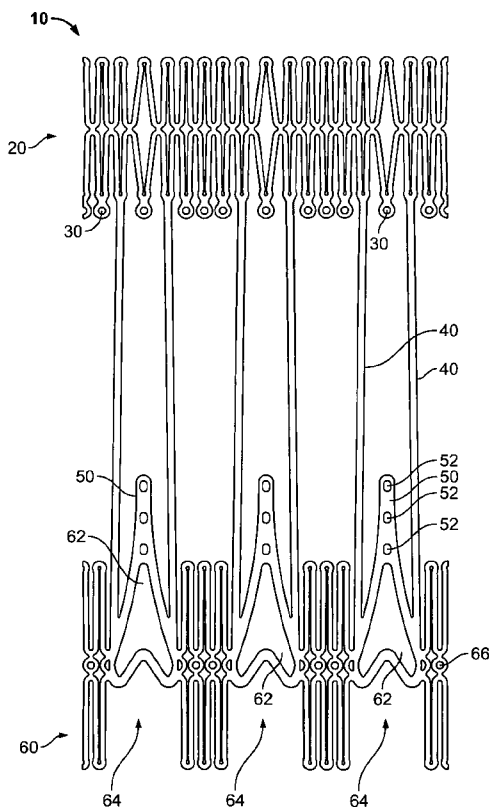


FIG. 1

(57) Abstract: A frame structure for a collapsible and re-expandable prosthetic heart valve. The frame structure includes an annular annulus portion that is configured for implanting in or near a patient's native heart valve annulus. This annulus portion of the frame structure may include a plurality of annularly spaced commissure post structures interconnected by connecting structures. The commissure post structures may be more resistant to annular collapse than the connecting structures. In the case of a prosthetic aortic valve, the frame structure may also include an annular aortic portion. The aortic portion may include a plurality of attachment points (for tethers) closest to the annulus portion. Such attachment points and tethers can facilitate re-collapse of a partly deployed valve in the event of a need to reposition or remove the valve.

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(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61F2/24

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 690 515 A (SORIN BIOMEDICA CARDIO S R L [IT]) 16 August 2006 (2006-08-16) paragraphs [0060], [0061]; figure 4	1-13
A	US 2006/122692 A1 (GILAD RAN [CA] ET AL) 8 June 2006 (2006-06-08) paragraph [0047]; figures 1-3,6	1
E	WO 2008/150529 A (ST JUDE MEDICAL [US]; BRAIDO PETER N [US]; ALKHATIB YOUSEF F [US]) 11 December 2008 (2008-12-11) paragraphs [0098], [0101]; claims 6,26,29,31; figures 25,26	1,11,12

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
- *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

30 March 2009

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16/07/2009

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.
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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:

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: 1-13

Claims 1-13 directed to a frame structure for a prosthetic heart valve as defined by the subject-matter of claim 1.

2. claims: 14-23

Claims 14-23 directed to a frame structure for a prosthetic heart valve as defined by the subject-matter of claim 14.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2008/012437

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1690515 A	16-08-2006	AT 402672 T WO 2006085225 A1 US 2008249619 A1 US 2006178740 A1	15-08-2008 17-08-2006 09-10-2008 10-08-2006
US 2006122692 A1	08-06-2006	US 2006095115 A1 US 2006122686 A1 US 2006122693 A1	04-05-2006 08-06-2006 08-06-2006
WO 2008150529 A	11-12-2008	NONE	