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(71) Applicant (for all designated States except US): **BOSTON SCIENTIFIC SCIMED, INC.** [US/US]; One Scimed Place, Maple Grove, MN 55311-1566 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **EIDENSCHINK, Tracee, E.j.** [US/US]; 2232 Pinton Drive, Wayzata, MN 55391 (US). **TOMASCHKO, Daniel** [US/US]; 9400 Creek Ridge Lane, Savage, MN 55378 (US). **JAGGER, Karl, A.** [US/US]; 19510 Vine Street, Deephaven, MN 55331 (US).

(74) Agents: **CAMERON, Jeffery, L.** et al.; Brooks, Cameron, & Huebsch, PLLC, 1221 Nicollet Avenue, Suite 500, Minneapolis, MN 55403 (US).

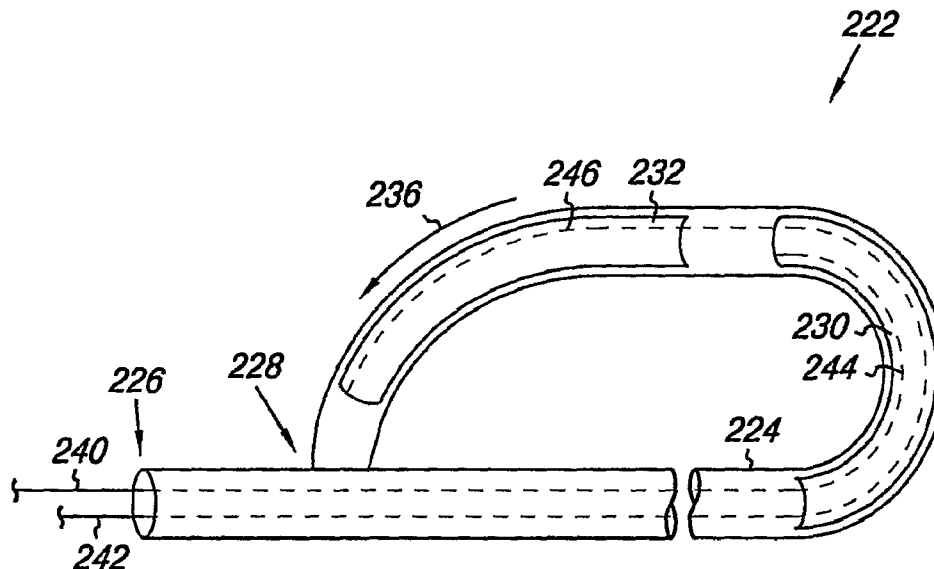
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(54) Title: SEPTAL DEFECT CLOSURE DEVICE, SYSTEM, AND METHOD



(57) Abstract: The present disclosure relates generally to devices, systems and methods for use with cardiac defects. A closure device includes an elongate body with a first actuator segment and a second actuator segment associated with the elongate body that can be bent into a first predetermined position and then to a second predetermined position where the distal end and the proximal end of the elongate body are more closely positioned than when in the first predetermined position.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER INV. A61B17/00		
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) 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) 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 Y	US 2006/069408 A1 (KATO YUKITOSHI [JP]) 30 March 2006 (2006-03-30) abstract; figures 11-18 paragraphs [0044], [0056], [0101], [0102]	1,7,10, 11 2-6
X	US 4 485 816 A (KRUMME JOHN F [US]) 4 December 1984 (1984-12-04) abstract; figures 1-3 column 3, lines 45-57 column 6, lines 30-36	1-3,7, 10,11
Y	US 6 323 459 B1 (MAYNARD RONALD S [US]) 27 November 2001 (2001-11-27) abstract; figures 24A-C,28-33 column 3, lines 4-12	2,3
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> 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 11 January 2008	Date of mailing of the international search report 16/04/2008	
Name and mailing address of the ISA/ 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	Authorized officer Dennler, Samuel	

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.
Y	US 2004/054322 A1 (VARGAS JAIME SALVADOR [US]) 18 March 2004 (2004-03-18) abstract; figure 20A paragraph [0074]	4-6

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 17-22.

As it is supported by the description, claims 17-22 are related to a method of delivering a closure device in the heart of a patient, in order to treat a septal defect. This subject-matter is considered to be covered by the provisions of Rule 39.1(iv) PCT (methods for treatment of the human or animal body by surgery). Consequently, the subject-matter of these claims was not searched (Article 17(2)(a)(i) PCT).

INTERNATIONAL SEARCH REPORT

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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.: 17-22
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210

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 additional sheet(s)

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: 1-7, 10-11

a closure device comprising an elongate body with actuator segments for controlling the shape of said elongate body, wherein the actuator segments comprise a shape memory polymer or an electroactive polymer as well as appropriate energy-supplying elements, so that the shape control can be performed more easily.

2. claims: 8-9, 14-15

a closure device comprising an elongate body with actuator segments for controlling the shape of said elongate body, wherein the elongate body can adopt specific shapes allowing a better closure effect of a septal defect.

3. claim: 12

a remotely-controllable connection socket for releasably coupling a closure device to the distal end of a delivery catheter, wherein the socket includes a shape memory polymer and can be enlarged if heated for releasing the closure device.

4. claim: 13

a closure device comprising an elongate body with actuator segments for controlling the shape of said elongate body, wherein the actuator segments restrain the elongate body from bending and hold it in a constrained straight configuration, so that it can be delivered easily through a delivery catheter.

5. claim: 16

a closure device comprising an elongate body defining a slit adjacent to the proximal end which can receive the distal end of said elongate body, so that a closed loop shape, and therefore a safer closure of a septal defect, can be achieved.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/018777

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006069408 A1	30-03-2006	JP 2006122668 A	18-05-2006
US 4485816 A	04-12-1984	NONE	
US 6323459 B1	27-11-2001	NONE	
US 2004054322 A1	18-03-2004	NONE	