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(54) Three-dimensional image reconstruction using doppler ultrasound

(57) A method for imaging of an anatomical structure includes acquiring a plurality of ultrasonic images of the anatomical structure. At least one of the images includes Doppler information. One or more contours of the anatomical structure are generated from the Doppler information. A three-dimensional image of the anatomical structure is reconstructed from the plurality of ultrasonic images, using the one or more contours.

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EUROPEAN SEARCH REPORT

Application Number
EP 09 25 0003

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 717 759 A1 (BIOSENSE WEBSTER INC [US]) 2 November 2006 (2006-11-02) * abstract * * paragraphs [0027], [0082] - [0085], [0089] * -----	1,4-6, 9-12,17, 19	INV. G06T7/00 A61B8/14
A	WO 2005/072617 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; AVERKIOU MICHALAKIS [US]; BRUCE M) 11 August 2005 (2005-08-11) * abstract * * page 11, lines 9-24 * -----	1-6, 9-12,17, 19	
A	US 5 800 357 A (WITT JEROME F [US] ET AL) 1 September 1998 (1998-09-01) * abstract * * column 3, lines 41-58 * -----	1-6, 9-12,17, 19	
A	KALKER A A C M ET AL: "Cardiac Image Segmentation for Contrast Agent Videodensitometry", IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, IEEE SERVICE CENTER, PISCATAWAY, NJ, USA, vol. 52, no. 2, February 2005 (2005-02), pages 277-286, XP011125713, ISSN: 0018-9294, DOI: 10.1109/TBME.2004.840500 * abstract * * section I. * -----	1-6, 9-12,17, 19	TECHNICAL FIELDS SEARCHED (IPC) G06T

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
Berlin	16 June 2015	Gao, Miao

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-6, 9-12, 17, 19

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 09 25 0003

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-6, 9-12, 17, 19

   Determination of the contours of the anatomical structure

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2. claims: 7, 8

   Taking into account the velocity of movement of the ultrasound sensor

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3. claims: 13-16, 18

   Modelling of the blood flow in the heart

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 25 0003

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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16-06-2015

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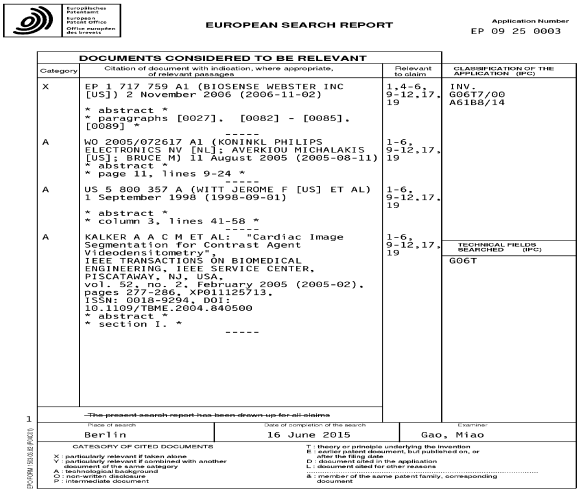
EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	使用多普勒超声进行三维图像重建		
公开(公告)号	EP2077526A3	公开(公告)日	2015-11-18
申请号	EP2009250003	申请日	2009-01-02
[标]申请(专利权)人(译)	韦伯斯特生物官能公司		
申请(专利权)人(译)	生物传感韦伯斯特，INC.		
当前申请(专利权)人(译)	生物传感韦伯斯特，INC.		
[标]发明人	GOVARI ASSAF ALTMANN ANDRES CLAUDIO EPHRATH YARON SCHWARTZ YITZHACK		
发明人	GOVARI, ASSAF ALTMANN, ANDRES CLAUDIO EPHRATH, YARON SCHWARTZ, YITZHACK		
IPC分类号	G06T7/00 A61B8/14		
CPC分类号	A61B8/543 A61B6/541 A61B8/12 A61B8/14 G06T7/13 G06T7/564 G06T2207/10012 G06T2207/10132 G06T2207/30048		
审查员(译)	高，苗		
优先权	12/969504 2008-01-04 US		
其他公开文献	EP2077526A2		
外部链接	Espacenet		

摘要(译)

用于成像解剖结构的方法包括获取解剖结构的多个超声图像。至少一个图像包括多普勒信息。从多普勒信息生成解剖结构的一个或多个轮廓。使用一个或多个轮廓从多个超声图像重建解剖结构的三维图像。



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& : member of the same patent family, corresponding document