



(11) **EP 2 306 185 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
21.03.2012 Bulletin 2012/12

(51) Int Cl.:
G01N 29/44 (2006.01) **G01N 29/06** (2006.01)
A61B 8/13 (2006.01)

(43) Date of publication A2:
06.04.2011 Bulletin 2011/14

(21) Application number: **10180923.4**

(22) Date of filing: **28.09.2010**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO SE SI SK SM TR**
Designated Extension States:
BA ME RS

(71) Applicant: **Fujifilm Corporation**
Minato-ku
Tokyo 106-8620 (JP)

(72) Inventor: **Katsuyama, Kimito**
Kanagawa 258-8538 (JP)

(30) Priority: **30.09.2009 JP 2009227225**
31.03.2010 JP 2010081053

(74) Representative: **Klunker . Schmitt-Nilson . Hirsch**
Patentanwälte
Destouchesstrasse 68
80796 München (DE)

(54) **Ultrasound diagnostic apparatus and signal processing method thereof**

(57) The presently disclosed subject matter is intended to correctly determine an ambient sound velocity at each level of pixels or line images constituting an ultrasound image, and construct a high-precision ultrasound image. A region-of-interest setting unit sets a region of interest on an ultrasound image. A transmission focus control unit gives a transmission focus instruction, so that a transmitting circuit performs transmission focusing on the region of interest. A set sound velocity specification

unit specifies a set sound velocity used to perform reception focusing on RF data. A focus index calculation unit performs reception focusing on the RF data for each of a plurality of set sound velocities to calculate the focus index of the RF data. An ambient sound velocity determination unit determines the ambient sound velocity of the region of interest on the basis of the focus index for each of the plurality of set sound velocities.

EP 2 306 185 A3



EUROPEAN SEARCH REPORT

Application Number
EP 10 18 0923

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	NAPOLITANO D ET AL: "Sound speed correction in ultrasound imaging", ULTRASONICS, IPC SCIENCE AND TECHNOLOGY PRESS LTD. GUILDFORD, GB, vol. 44, 22 December 2006 (2006-12-22), pages E43-E46, XP025009137, ISSN: 0041-624X, DOI: 10.1016/J.ULTRAS.2006.06.061 [retrieved on 2006-12-22] * abstract * * page e44, paragraphs 1,2 * * figures 2,3,6 *	1-4, 14-16	INV. G01N29/44 G01N29/06 A61B8/13
X	US 5 415 173 A (MIWA YUICHI [US] ET AL) 16 May 1995 (1995-05-16) * column 1, lines 5-11 * * column 9, lines 18-50 * * figures 1,4 *	1-4, 14-16	
X	US 2006/235302 A1 (GROSSMAN JEFFREY [CA] ET AL DAVIES TIMOTHY J [CA] ET AL) 19 October 2006 (2006-10-19) * paragraphs [0289] - [0293], [0303] - [0301] * * figures 32-34 *	1,14	TECHNICAL FIELDS SEARCHED (IPC) G01N A61B G01S G01F
A	US 2007/083110 A1 (LIN SHENG TZ [US] ET AL) 12 April 2007 (2007-04-12) * paragraphs [0011], [0032], [0036] - [0040] * * figures 3,5 *	1-16	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 February 2012	Examiner Couteau, Olivier
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 L : document cited for other reasons & : member of the same patent family, corresponding document	

 1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 18 0923

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-02-2012

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5415173	A	16-05-1995	NONE	
US 2006235302	A1	19-10-2006	NONE	
US 2007083110	A1	12-04-2007	NONE	

专利名称(译)	超声波诊断装置及其信号处理方法		
公开(公告)号	EP2306185A3	公开(公告)日	2012-03-21
申请号	EP2010180923	申请日	2010-09-28
[标]申请(专利权)人(译)	富士胶片株式会社		
申请(专利权)人(译)	富士胶片株式会社		
当前申请(专利权)人(译)	富士胶片株式会社		
[标]发明人	KATSUYAMA KIMITO		
发明人	KATSUYAMA, KIMITO		
IPC分类号	G01N29/44 G01N29/06 A61B8/13		
CPC分类号	A61B8/08 G01N29/0654 G01N29/4463 G01N2291/02475 G01N2291/0289 A61B8/145 A61B8/4444 A61B8/4488 A61B8/5207		
优先权	2009227225 2009-09-30 JP 2010081053 2010-03-31 JP		
其他公开文献	EP2306185A2		
外部链接	Espacenet		

摘要(译)

当前公开的主题旨在正确地确定构成超声图像的每个级别的像素或线图像的环境声速，并构建高精度超声图像。感兴趣区域设置单元在超声图像上设置感兴趣区域。发送聚焦控制单元给出发送聚焦指令，使得发送电路执行聚焦在感兴趣区域上的发送。设定声速指定单元指定用于执行关注RF数据的接收的设定声速。聚焦指标计算单元针对多个设定声速中的每一个执行聚焦于RF数据的接收，以计算RF数据的聚焦指标。环境声速确定单元基于多个设定声速中的每一个的焦点指数来确定感兴趣区域的环境声速。

 European Patent Office Rue de la Loi 200 1049 Luxembourg Tel. +352 4401-311 Fax +352 4401-3199 E-mail: epo@epo.org		EUROPEAN SEARCH REPORT		Application Number EP 10 18 0923
DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of documents with indication, where appropriate, of relevant passages	Relevant to priority	CLASSIFICATION OF THE APPLICATION (IPC)	
X	NAPOLITANO D ET AL: "Sound speed correction in ultrasound imaging", ULTRASONICS, IPC SCIENCE AND TECHNOLOGY PRESS LTD, GUILDFORD, GB, vol. 46, 28 december 2006 (2006-12-22), pages E43-E46, XP02509137, ISSN: 0041-624X, DOI: 10.1016/J.ULTRAS.2006.06.061 [retrieved on 2006-12-22] * abstract * page 44, paragraphs 1.2 * * figures 2.3,6 *	1-4, 14-16	INV. G01N29/44 G01N29/06 A61B8/13	
X	US 5 415 173 A (MIWA YUICHI [US] ET AL) 16 May 1995 (1995-05-16) * column 1, lines 9-13 * * column 9, lines 18-50 * * figures 1,4	1-4, 14-16		
X	US 2006/235302 A1 (GROSSMAN JEFFREY [CA] ET AL DAVIES TIMOTHY J [CA] ET AL) 19 October 2006 (2006-10-19) * paragraphs [0289] - [0293], [0303] - [0301] * figures 32-34 *	1, 14	TECHNICAL FIELD OF INVENTION G01N A61B G01S G01F	
A	US 2007/083110 A1 (LIN SHENG TZ [US] ET AL) 12 April 2007 (2007-04-12) * paragraphs [0011], [0032], [0036] - [0040] * figures 3,5 *	1-16		
The present search report has been drawn up for all claims				
Place of search The Hague		Date of completion of the search 8 February 2012		Examiner Couteau, Olivier
CATEGORY OF CITED DOCUMENTS		1. priority or comparable underlying the invention 2. citing or cited document, but published on, or after, the filing date of the application 3. document cited for other reasons 4. remainder of the same patent family, corresponding document		
X	particularly relevant of nature above			
A	particularly relevant of nature above			
W	document of the same category			
Q	intermediate document			