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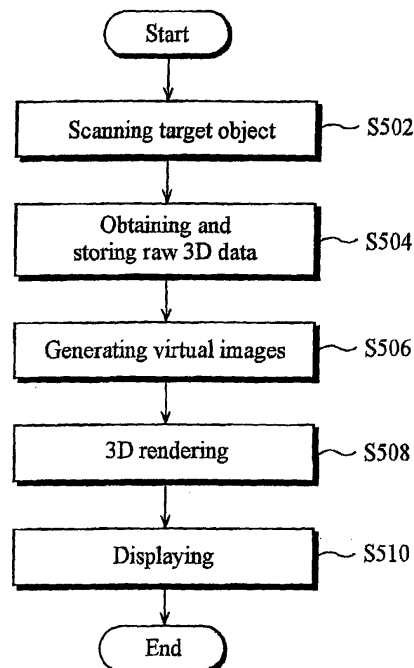
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(54) **Method and apparatus for producing three-dimensional ultrasonic images in quasi real time**

(57) Disclosed is an apparatus and method for producing a three-dimensional (3D) moving image of a moving target object. The method comprises the steps of transmitting and receiving ultrasound signals to / from the moving target object (S202), obtaining raw data (S204); generating image frame data based on the obtained raw data; generating virtual image frame data based on the generated image frame data; and rendering (S206) a 3D moving image of the moving target object using the image and virtual image frame data. The apparatus comprises a probe, a raw 3D data obtaining unit, and an enhanced live 3D imaging unit for producing a 3D image of the moving target object.

Fig. 5





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EUROPEAN SEARCH REPORT

Application Number
EP 03 07 6809

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 944 026 A (ALOKA CO LTD) 22 September 1999 (1999-09-22) * abstract; figures 1,6,7 * * column 1, line 7 - column 3, line 48 * * column 6, line 38 - column 7, line 33 * * column 10, line 49 - column 11, line 15 * * column 13, line 3 - column 14, line 44 * * column 19, lines 8-23 * * column 19, line 43 - column 20, line 34 *	1-6	G01S15/89 G01S15/89 G01S7/52
X	US 6 162 174 A (FRIEMEL BARRY H) 19 December 2000 (2000-12-19) * abstract; figure 8 * * column 1, lines 7-67 * * column 3, lines 26-31 * * column 4, line 53 - column 6, line 26 *	1-6	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G01S
Y	US 2002/045822 A1 (AVERKIOU MICHALAKIS ET AL) 18 April 2002 (2002-04-18) * paragraph [0067] *	1-6	
Y	RIBAS-CORBERA J ET AL: "Interpolation of cinematic sequences" APPLICATIONS OF COMPUTER VISION, PROCEEDINGS, 1992., IEEE WORKSHOP ON PALM SPRINGS, CA, USA 30 NOV.-2 DEC. 1992, LOS ALAMITOS, CA, USA, IEEE COMPUT. SOC, US, 30 November 1992 (1992-11-30), pages 36-44, XP010029164 ISBN: 0-8186-2840-5 * abstract; figures 1-5 * * page 36, left-hand column, paragraph 1 - page 40, left-hand column, paragraph 2 *	1-6	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 December 2004	Examiner Reuss, T
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			

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EUROPEAN SEARCH REPORT

Application Number
EP 03 07 6809

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 5 966 178 A (EDANAMI TAKAFUMI ET AL) 12 October 1999 (1999-10-12) * abstract; figures 1-3 * * column 1, line 6 - column 5, line 19 * -----	1-6	
A	BASOGLU C ET AL: "Computing requirements of modern medical diagnostic ultrasound machines" PARALLEL COMPUTING, ELSEVIER PUBLISHERS, AMSTERDAM, NL, vol. 24, no. 9-10, September 1998 (1998-09), pages 1407-1431, XP004148103 ISSN: 0167-8191 * the whole document * -----	1-6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 December 2004	Examiner Reuss, T
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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

EP 03 07 6809

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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20-12-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0944026	A	22-09-1999	JP 3218216 B2	15-10-2001
			JP 11267126 A	05-10-1999
			EP 0944026 A2	22-09-1999
			US 6263093 B1	17-07-2001

US 6162174	A	19-12-2000	NONE	

US 2002045822	A1	18-04-2002	US 6468216 B1	22-10-2002
			WO 0217296 A1	28-02-2002
			WO 0217297 A1	28-02-2002
			WO 0215775 A2	28-02-2002
			WO 0217298 A1	28-02-2002
			EP 1242991 A1	25-09-2002
			EP 1216472 A1	26-06-2002
			EP 1216473 A1	26-06-2002
			EP 1312074 A2	21-05-2003
			JP 2004506466 T	04-03-2004
			JP 2004506496 T	04-03-2004
			JP 2004506497 T	04-03-2004
			JP 2004506498 T	04-03-2004
			US 2002045820 A1	18-04-2002
			US 2002045823 A1	18-04-2002
			US 2002045830 A1	18-04-2002
			US 2002045824 A1	18-04-2002
			US 2002045826 A1	18-04-2002
			US 2002045827 A1	18-04-2002

US 5966178	A	12-10-1999	JP 10336599 A	18-12-1998

专利名称(译)	用于准实时地产生三维超声图像的方法和设备		
公开(公告)号	EP1372001A3	公开(公告)日	2005-02-09
申请号	EP2003076809	申请日	2003-06-11
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当前申请(专利权)人(译)	MEDISON CO. , LTD.		
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IPC分类号	A61B8/00 G01S7/52 G01S15/89 G06T1/00 G06T13/20		
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优先权	1020020032756 2002-06-12 KR		
其他公开文献	EP1372001B1 EP1372001A2		
外部链接	Espacenet		

摘要(译)

公开了一种用于产生移动目标对象的三维 (3D) 运动图像的装置和方法。该方法包括以下步骤：向/从移动目标对象发送和接收超声信号 (S202)，获得原始数据 (S204)；基于所获得的原始数据生成图像帧数据；基于所生成的图像帧数据生成虚拟图像帧数据；以及使用图像和虚拟图像帧数据渲染 (S206) 移动目标对象的3D运动图像。该装置包括探头，原始3D数据获得单元和增强活3D成像单元，用于产生移动目标对象的3D图像。

Fig. 5

