



(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
15.12.2004 Bulletin 2004/51

(51) Int Cl.7: A61B 8/12, A61B 8/08

(43) Date of publication A2:  
10.11.2004 Bulletin 2004/46

(21) Application number: 04010560.3

(22) Date of filing: 04.05.2004

(84) Designated Contracting States:  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IT LI LU MC NL PL PT RO SE SI SK TR  
Designated Extension States:  
AL HR LT LV MK

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(30) Priority: 07.05.2003 JP 2003129173

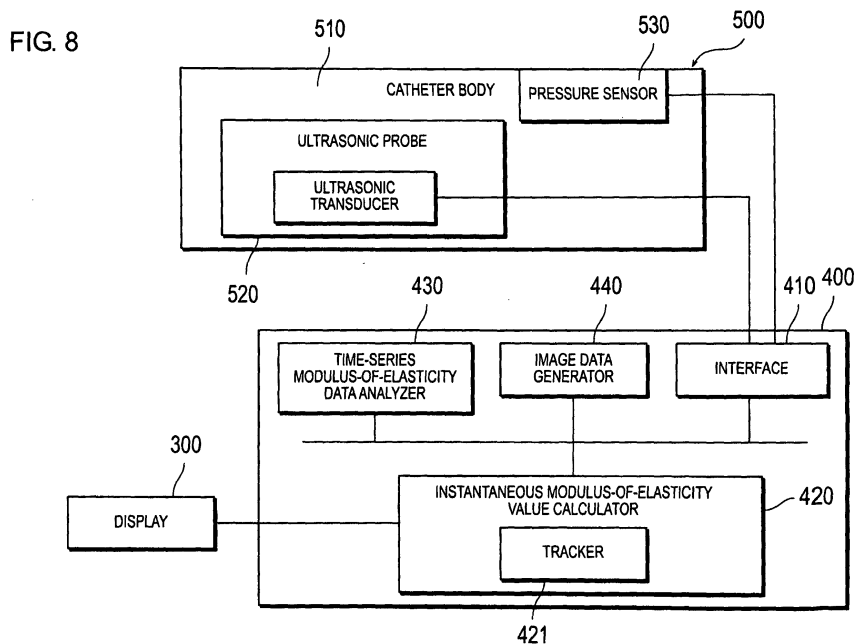
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(54) Device to measure the elasticity of a blood vessel by intravascular ultrasound

(57) An ultrasonic diagnostic system according to the present invention has an ultrasonic transducer(520) mounted on a catheter(510), an instantaneous distortion value calculator(420) which calculates an instantaneous distortion value at the location to be evaluated in the blood vessel based on received signal representative of received reflection by the ultrasonic transducer

(520), an analyzer(430) which analyzes a state of the location to be evaluated using time-series data of instantaneous distortion values which are calculated at a plurality of times in a chronological sequence by the distortion value calculator(510), and a display(300) which displays an analyzed result produced by the analyzer(430).





European Patent  
Office

EUROPEAN SEARCH REPORT

Application Number  
EP 04 01 0560

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 Y A	US 5 125 410 A (MISONO KAZUHIRO ET AL) 30 June 1992 (1992-06-30)  * column 6, line 35 - column 12, line 49 * -----	1,9,13, 21,25,26 12,24 2-5, 14-17	A61B8/12 A61B8/08
Y	VARGHESE T ET AL: "Noise reduction in elastograms using temporal stretching with multicompression averaging" ULTRASOUND IN MEDICINE AND BIOLOGY ELSEVIER USA, vol. 22, no. 8, 1996, pages 1043-1052, XP002299612 ISSN: 0301-5629 * Introduction p. 1043-1044 *	12,24	
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X Y	WO 03/017845 A (SCHAAR JOHANNES ANTONIUS ; DE KORTE CHRISTOFFEL LEENDERT (NL); MASTIK) 6 March 2003 (2003-03-06)  * page 6, line 9 - page 7, line 12 * * page 8, line 26 - page 9, line 5 * ----- -/--	1,9,13, 21  6-8, 18-20	
The present search report has been drawn up for all claims			
Place of search <b>Berlin</b>		Date of completion of the search <b>7 October 2004</b>	Examiner <b>Trachterna, M</b>
<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 ..... &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/02 (P04C01)



European Patent Office

EUROPEAN SEARCH REPORT

Application Number  
EP 04 01 0560

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	NITTA N ET AL: "Tissue elasticity reconstruction based on three-dimensional displacement data estimated by the weighted phase gradient method" 1999 IEEE ULTRASONICS SYMPOSIUM. PROCEEDINGS. INTERNATIONAL SYMPOSIUM (CAT. NO.99CH37027) IEEE PISCATAWAY, NJ, USA, vol. 2, 1999, pages 1665-1668 vol., XP002299613 ISBN: 0-7803-5722-1 * page 1665, left-hand column, line 1 - page 1667, left-hand column, line 15 *	6-8, 18-20	
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A	US 6 270 459 B1 (KONOFAGOU ELISA ET AL) 7 August 2001 (2001-08-07) * column 7, line 44 - column 8, line 15 *	6-8, 18-20	
P,A	WO 2004/010872 A (NITTA NAOTAKA ; SHIINA TSUYOSHI (JP); YAMAKAWA MAKOTO (JP); HITACHI ME) 5 February 2004 (2004-02-05) * the whole document *	1,13	
The present search report has been drawn up for all claims			
Place of search Berlin		Date of completion of the search 7 October 2004	Examiner Trachterna, M
<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 &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04C01)



European Patent  
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Application Number  
EP 04 01 0560

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims 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 the first ten claims.

**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:



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: 1-3,9,13-15,21,25,26

A ultrasonic diagnostic apparatus wherein the analyser divides time-series data into a plurality of frequency components

1.1. claims: 4,5,16,17

A ultrasonic diagnostic apparatus wherein the analyser calculates a phase lag of time-series data  
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2. claims: 6-8,10,11,18-20,22,23

A ultrasonic diagnostic apparatus wherein the distortion value calculator tracks the position of the location to be evaluated in the blood vessel according to an autocorrelation process or a composite autocorrelation process.  
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3. claims: 12,24

A ultrasonic diagnostic apparatus wherein the distortion value calculator performs a spatial local smoothing process, a bandpass filtering process or a stabilizing process based on synchronous addition in order to reduce noise  
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Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

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

EP 04 01 0560

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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07-10-2004

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专利名称(译)	通过血管内超声测量血管弹性的装置		
公开(公告)号	<a href="#">EP1475040A3</a>	公开(公告)日	2004-12-15
申请号	EP2004010560	申请日	2004-05-04
[标]申请(专利权)人(译)	泰尔茂株式会社		
申请(专利权)人(译)	泰尔茂株式会社		
当前申请(专利权)人(译)	泰尔茂株式会社		
[标]发明人	SHIINA TSUYOSHI NITTA NAOTAKA YAGAMI HIROYUKI		
发明人	SHIINA, TSUYOSHI NITTA, NAOTAKA YAGAMI, HIROYUKI		
IPC分类号	A61B8/08 A61B8/12 G01S7/52		
CPC分类号	A61B5/02007 A61B8/08 A61B8/12 A61B8/485 G01S7/52036		
代理机构(译)	CASALONGA , AXEL		
优先权	2003129173 2003-05-07 JP		
其他公开文献	EP1475040A2		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

根据本发明的超声波诊断系统具有安装在导管 ( 510 ) 上的超声波换能器 ( 520 ) , 瞬时失真值计算器 ( 420 ) , 其基于计算血管中要评估的位置处的瞬时失真值。接收信号表示超声换能器 ( 520 ) 接收到的反射, 分析器 ( 430 ) 使用按时间顺序多次计算的瞬时失真值的时间序列数据分析待评估位置的状态通过失真值计算器 ( 510 ) 和显示由分析器 ( 430 ) 产生的分析结果的显示器 ( 300 ) 。

FIG. 8

