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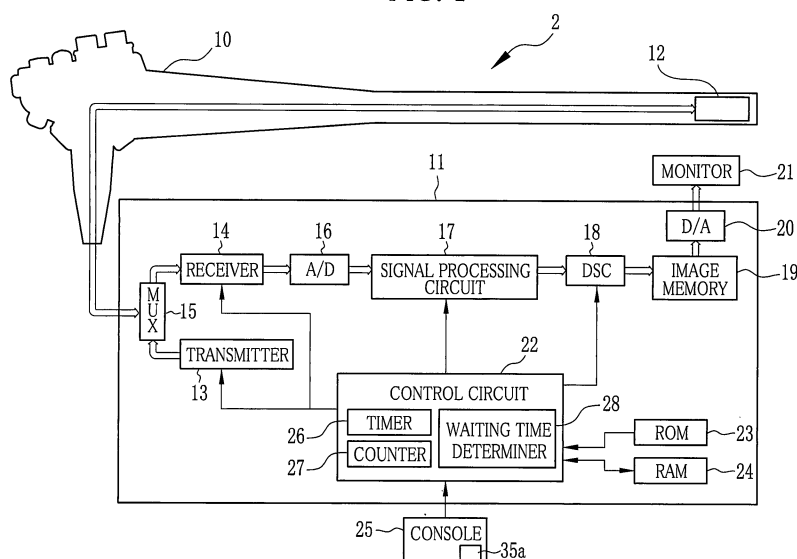
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(54) **Ultrasound observation device and method for controlling operation thereof**

(57) An ultrasound observation device (11) includes a depth knob (35, 40) and a pulse generator (35a, 40a). The depth knob (35, 40) is operated to switch the display depth of an ultrasound image on a monitor (21). Upon every rotation of the depth knob (35, 40) by a predetermined angle, the pulse generator (35a, 40a) generates a switching pulse. A control circuit (22) has a waiting time determiner (28), which determines a waiting time to start signal processing every time the switching pulse is generated.

erated. When a subsequent switching pulse is generated within the waiting time, the waiting time determiner (28) calculates an average generation interval of the switching pulses, and determines a new waiting time based on the average generation interval. When the waiting time elapsed without the generation of a subsequent switching pulse, the control circuit (22) recognizes the end of switching operation, and starts a display switching process under the conditions corresponding to the number of the switching pulses generated.

FIG. 1





EUROPEAN SEARCH REPORT

Application Number
EP 09 00 8293

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,D A	JP 2002 315753 A (OLYMPUS OPTICAL CO) 29 October 2002 (2002-10-29) * abstract *	1,10,16 11,17	INV. A61B8/00 G06F3/03
X,D A	JP 2007 313202 A (FUJIFILM CORP; FUJINON CORP) 6 December 2007 (2007-12-06) * abstract *	1,10,16 11,17	
A	JP 2002 238892 A (SHIMADZU CORP) 27 August 2002 (2002-08-27) * abstract *	1,11,16, 17	
A	JP 04 336050 A (TOKYO SHIBAURA ELECTRIC CO) 24 November 1992 (1992-11-24) * abstract *	1,11,16, 17	
A	US 2006/111634 A1 (WU TONY [US]) 25 May 2006 (2006-05-25) * paragraphs [0004] - [0006] * * paragraphs [0019] - [0021] * * claim 1 * * figures 1,2 *	1,11,16, 17	TECHNICAL FIELDS SEARCHED (IPC) A61B G06F
A	US 2005/240103 A1 (BYRD CHARLES B [US] ET AL) 27 October 2005 (2005-10-27) * paragraphs [0017] - [0019] * * figures 1-5 *	1,11,16, 17	
A	JP 04 281511 A (MATSUSHITA ELECTRIC IND CO LTD) 7 October 1992 (1992-10-07) * abstract *	1,11,16, 17	
4 The present search report has been drawn up for all claims			
Place of search Berlin		Date of completion of the search 7 September 2009	Examiner Völlinger, Martin
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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Application Number

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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:

see annex

☐ 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).

**LACK OF UNITY OF INVENTION
SHEET B**Application Number
EP 09 00 8293

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: 1-6,10-13,16,17

An ultrasound observation device and method for controlling operation of an ultrasound observation device which determines the waiting time to start a display switching process based on measured generation intervals of the switching pulses or on the basis of the operation history of the operating member.

2. claims: 7,14

An ultrasound observation device which terminates an ongoing display switching process when said switching pulse is generated during said display switching process.

3. claims: 8,9,15

An ultrasound observation device comprising means to detect operation of the operating member.

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

EP 09 00 8293

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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07-09-2009

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专利名称(译)	超声波观察装置及其控制操作的方法		
公开(公告)号	EP2138099A3	公开(公告)日	2010-01-06
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[标]申请(专利权)人(译)	富士胶片株式会社		
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当前申请(专利权)人(译)	富士胶片株式会社		
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优先权	2008165930 2008-06-25 JP 2008165815 2008-06-25 JP		
其他公开文献	EP2138099A2		
外部链接	Espacenet		

摘要(译)

超声波观察装置 (11) 包括深度旋钮 (35,40) 和脉冲发生器 (35a , 40a) 。操作深度旋钮 (35,40) 以在监视器 (21) 上切换超声图像的显示深度。在每次旋转深度旋钮 (35,40) 预定角度时, 脉冲发生器 (35a , 40a) 产生切换脉冲。控制电路 (22) 具有等待时间确定器 (28) , 其确定每次产生切换脉冲时开始信号处理的等待时间。当在等待时间内产生后续切换脉冲时, 等待时间确定器 (28) 计算切换脉冲的平均产生间隔, 并基于平均产生间隔确定新的等待时间。当在没有产生后续切换脉冲的情况下经过等待时间时, 控制电路 (22) 识别切换操作的结束, 并在与产生的切换脉冲的数量相对应的条件下开始显示切换处理。

