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(54) **Computer-implemented method for remote evaluation of ambulatory electrocardiographic monitoring**

(57) A computer-implemented method for evaluating ambulatory electrocardiographic (ECG) monitoring of cardiac rhythm disorders is provided. A patient (12) is registered online and medical records for the patient (12) are assembled. An ambulatory ECG monitor (15) that includes leadless integrated sensing electrodes independently suspended from a flexible housing, is registered to the patient (12). The monitor is sent to a referral center, e.g. using a pre-addressed sealable envelope (18). An electrocardiogram (25) is retrieved from the recording circuitry. The electrocardiogram (25) and the medical records are evaluated against diagnostic criteria.

Upon making a finding when the diagnostic criteria is met, the patient (12) is referred to a cardiac rhythm specialist online, which includes sending the cardiac rhythm abnormality finding. As a result, both physicians and patients enjoy an ease-of-use not found with conventional ambulatory ECG monitors (15). By bypassing determining whether a referral is needed and separately establishing the referral, patients (12) can be treated more completely and more rapidly than through conventional patient referral, especially for serious illness, with less cost and less delay.

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EUROPEAN SEARCH REPORT

Application Number  
EP 11 18 4156

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	US 2007/255153 A1 (KUMAR UDAY N [US] ET AL) 1 November 2007 (2007-11-01) * paragraphs [0044] - [0045], [0050], [0057] - [0062], [0070], [0106], [0118] - [0130]; figures 3A, 3B, 15,16 * -----	1-4,6,8,15 5	INV. A61B5/00 A61B5/0402 G06F19/00
X	LIEBERMAN JONATHON: "How telemedicine is aiding prompt ECG diagnosis in primary care", BRITISH JOURNAL OF COMMUNITY NURSING, vol. 13, no. 3, 1 March 2008 (2008-03-01), pages 123-126, XP009155082, ISSN: 1462-4753 * the whole document * -----	1	
X	WO 2010/066507 A1 (BOSCH GMBH ROBERT [DE]; HENKE SASCHA [DE]) 17 June 2010 (2010-06-17) * the whole document * -----	1	
A	US 2004/034284 A1 (AVERSANO THOMAS R [US] ET AL) 19 February 2004 (2004-02-19) * paragraphs [0029], [0031] - [0032], [0034], [0037], [0042], [0060], [0105]; figures * -----	1	TECHNICAL FIELDS SEARCHED (IPC) A61B G06F
A	US 2007/276270 A1 (TRAN BAO [US]) 29 November 2007 (2007-11-29) * paragraph [0215] * -----	5	
A	US 2003/083559 A1 (THOMPSON DAVID L [US]) 1 May 2003 (2003-05-01) * paragraph [0060] * -----	5	
-The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 December 2011	Examiner Küster, Gunilla
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	

3  
EPO FORM 1503 03.82 (P04C01)



Application Number

EP 11 18 4156

**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, 8, 15
- 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 11 18 4156

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, 8, 15

tracking / status determination; follow-up

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2. claims: 7, 14

details of the ambulatory monitor

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3. claim: 9

details of the diagnostic analysis

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4. claims: 10, 11

timing and corresponding triggering of time periods for  
follow-up

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5. claims: 12, 13

electronically-stored diary

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

EP 11 18 4156

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.

23-12-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007255153 A1	01-11-2007	CA 2651203 A1	16-08-2007
		EP 1981402 A2	22-10-2008
		JP 2009525816 A	16-07-2009
		US 2007225611 A1	27-09-2007
		US 2007249946 A1	25-10-2007
		US 2007255153 A1	01-11-2007
		WO 2007092543 A2	16-08-2007
WO 2010066507 A1	17-06-2010	CA 2743658 A1	12-05-2011
		CN 102245084 A	16-11-2011
		DE 102008054442 A1	17-06-2010
		EP 2375964 A1	19-10-2011
		US 2011301429 A1	08-12-2011
		WO 2010066507 A1	17-06-2010
US 2004034284 A1	19-02-2004	NONE	
US 2007276270 A1	29-11-2007	US 2007276270 A1	29-11-2007
		US 2009318779 A1	24-12-2009
US 2003083559 A1	01-05-2003	NONE	

专利名称(译)	计算机实现的动态心电图监测远程评估方法		
公开(公告)号	<a href="#">EP2438848A3</a>	公开(公告)日	2012-05-30
申请号	EP2011184156	申请日	2011-10-06
[标]申请(专利权)人(译)	心脏科学公司		
申请(专利权)人(译)	心脏科技股份有限公司		
当前申请(专利权)人(译)	心脏科技股份有限公司		
[标]发明人	BARDY GUST H BISHAY JON MIKALSON		
发明人	BARDY, GUST H. BISHAY, JON MIKALSON		
IPC分类号	A61B5/00 A61B5/0402 G06F19/00		
CPC分类号	A61B5/0006 A61B5/0402 A61B5/0432 A61B2562/08 G16H10/60 G16H40/20 G16H80/00		
优先权	12/901461 2010-10-08 US		
其他公开文献	EP2438848B1 EP2438848A2 EP2438848B8		
外部链接	<a href="#">Espacenet</a>		

摘要(译)

提供了一种用于评估心律紊乱的动态心电图 ( ECG ) 监测的计算机实现的方法。患者 ( 12 ) 在线注册并且组装患者 ( 12 ) 的医疗记录。包括独立悬挂在柔性外壳上的无引线集成感测电极的移动ECG监视器 ( 15 ) 被注册到患者 ( 12 ) 。监视器被发送到转诊中心, 例如使用预先设定的可密封信封 ( 18 ) 。从记录电路检索心电图 ( 25 ) 。根据诊断标准评估心电图 ( 25 ) 和医疗记录。在满足诊断标准时进行发现时, 患者 ( 12 ) 在线被称为心律专家, 其包括发送心律异常发现。因此, 医生和患者都享有传统动态心电监护仪所不具备的易用性 ( 15 ) 。通过绕过确定是否需要转诊并单独建立转诊, 患者 ( 12 ) 可以比通过常规患者转诊更完整和更快速地治疗, 特别是对于严重疾病, 患者成本更低且延迟更少。

DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X, D	US 2007/255153 A1 (KUMAR UDAY N [US] ET AL) 1 November 2007 [2007-11-01] * paragraphs [0044], [0045], [0050], [0057], [0062], [0070], [0106], [0118] - [0130]; figures 3A, 3B, 15-16	1-4, 6, 8, 15	INV. A61B5/00 A61B5/0402 G06F19/00
X	LIEBERMAN JONATHAN: "How telemedicine is aiding prompt ECG diagnosis in primary care"; BRITISH JOURNAL OF COMMUNITY NURSING, vol. 13, no. 3, 1 March 2008 (2008-03-01), pages 123-126, XP009155082, ISSN: 1465-4753 * the whole document	1	
X	WO 2010/065507 A1 (BOSCH GMBH ROBERT [DE]; HEINE SASCHA [DE]) 17 June 2010 (2010-06-17) * the whole document	1	
A	US 2004/034284 A1 (AVERASANO THOMAS R [US] ET AL) 19 February 2004 (2004-02-19) * paragraphs [0029], [0031], [0032], [0034], [0037], [0042], [0060]. [0105]; figures	1	TECHNICAL FIELDS SEARCHED (IPC) A61B G06F
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A	US 2003/083559 A1 (THOMPSON DAVID L [US]) 1 May 2003 (2003-05-01) * paragraph [0060]	5	
* The present search report has been drawn up for all claims			
Munich		23 December 2011	Kuster, Gunilla
CATEGORY OF CITED DOCUMENTS * of prior art X: particularly relevant if claim above * particularly relevant if combined with another document of the same category A: non-patent literature D: intermediate document			
I: prior art privilege underlying the invention G: general statements for prior art on or after the filing date D: document cited in the application A: member of the same family B: member of the same patent family, corresponding document			