(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 210 555 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
17.11.2010 Bulletin 2010/46

(43) Date of publication A2:
28.07.2010 Bulletin 2010/30

(21) Application number: **09006039.3**

(22) Date of filing: **23.06.2004**

(51) Int Cl.:
A61B 5/04 *(2006.01)* ***A61H 31/00*** *(2006.01)*

(84) Designated Contracting States:
DE FR GB

(30) Priority: **27.06.2003 US 609001**
06.11.2003 US 704366

(60) Divisional application:
10075412.6
10075413.4
10075414.2
10075415.9
10075416.7

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
04253737.3 / 1 491 176

(71) Applicant: **Zoll Medical Corporation**
Chelmsford
Massachusetts 01824-4105 (US)

(72) Inventors:
- **Geheb, Frederick**
  Danvers
  Massachusetts 01923 (US)
- **Boucher, Donald R.**
  Andover
  Massachusetts 01810 (US)
- **Freeman, Gary A.**
  Newton Center
  Massachusetts 02159 (US)

(74) Representative: **Charig, Raymond Julian et al**
Potter Clarkson LLP
Park View House
58 The Ropewalk
Nottingham
NG1 5DD (GB)

(54) Method and apparatus for enhancement of chest compressions during CPR

(57) An apparatus for assisting a rescuer in performing chest compressions during CPR on a victim, the apparatus comprising a pad or other structure configured to be applied to the chest near or at the location at which the rescuer applies force to produce the chest compressions, at least one sensor connected to the pad, the sensor being configured to sense movement of the chest or force applied to the chest, processing circuitry for processing the output of the sensor to determine whether the rescuer is substantially releasing the chest following chest compressions, and at least one prompting element connected to the processing circuitry for providing the rescuer with information as to whether the chest is being substantially released following chest compressions. A method of analyzing ECG signals during application of CPR, the method reducing artifacts in said ECG signal resulting from CPR chest compressions.

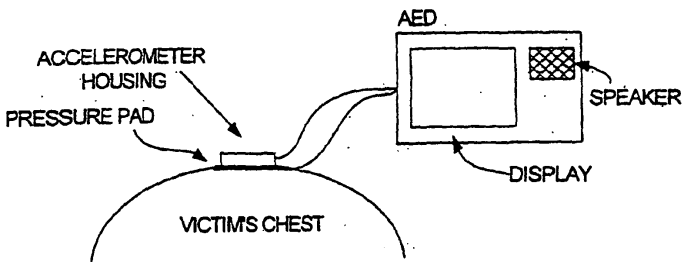

FIG. 1

EP 2 210 555 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 00 6039

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	US 6 390 996 B1 (HALPERIN HENRY R [US] ET AL) 21 May 2002 (2002-05-21) * column 6, line 11 - line 19 * * column 9, line 37 - column 13, line 4 * * figures 9-16 * -----	1-5	INV. A61B5/04 A61H31/00
A	EP 1 079 310 A2 (LAERDAL MEDICAL AS [NO]) 28 February 2001 (2001-02-28) * paragraph [0007] * * paragraph [0012] - paragraph [0027] * * figures 1-6 * * claims 1-3 * -----	1-7	
			TECHNICAL FIELDS SEARCHED (IPC) A61B

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
Munich	28 May 2010	Gärtner, Andreas

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

EPO FORM 1503 03.82 (P04C01)

2

Europäisches Patentamt
European Patent Office
Office européen des brevets

Application Number
EP 09 00 6039

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:

1-7

☐ 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).

Europäisches Patentamt
European Patent Office
Office européen des brevets

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 09 00 6039

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: 1-7

   Claim 1 is directed to a method of analysing ECG signals during application of CPR, comprising the steps of detecting ECG signals during application of CPR, detecting the output of a sensor related to the velocity of the chest movement, and using the information on the velocity to reduce a signal artifact in the ECG signal.

   ---

2. claims: 8-11

   Claim 8 is directed to an apparatus for assisting a rescuer in performing CPR with a pad and a bistable mechanical element that when depressed provides tactile feedback to the hand of the rescuer upon start of compression and at the end thereof.

   ---

3. claims: 12-15

   Claim 12 is directed to an apparatus and method for assisting a rescuer in performing chest compression during CPR having a velocity sensor.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 00 6039

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.

28-05-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6390996 B1	21-05-2002	AU 2146500 A	29-05-2000
		EP 1128795 A2	05-09-2001
		JP 2002529157 T	10-09-2002
		JP 2009285475 A	10-12-2009
		US 2002165471 A1	07-11-2002
		WO 0027464 A2	18-05-2000
		US 2002193711 A1	19-12-2002
		US 2002055694 A1	09-05-2002
EP 1079310 A2	28-02-2001	AU 772132 B2	08-04-2004
		AU 5335100 A	01-03-2001
		JP 2001104259 A	17-04-2001
		NO 994153 A	28-02-2001
		US 6807442 B1	19-10-2004

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	用于在CPR期间增强胸部按压的方法和设备		
公开(公告)号	EP2210555A3	公开(公告)日	2010-11-17
申请号	EP2009006039	申请日	2004-06-23
[标]申请(专利权)人(译)	卓尔医学产品公司		
申请(专利权)人(译)	ZOLL医疗公司		
当前申请(专利权)人(译)	ZOLL医疗公司		
[标]发明人	GEHEB FREDERICK BOUCHER DONALD R FREEMAN GARY A		
发明人	GEHEB, FREDERICK BOUCHER, DONALD R. FREEMAN, GARY A.		
IPC分类号	A61B5/04 A61H31/00 A61B5/0402 A61B5/00 A61B5/024 A61B5/0245 A61B5/11 A61B5/145 A61N1/39 A62B9/00 A62B33/00		
CPC分类号	A61B5/024 A61B5/0402 A61B5/11 A61B5/1102 A61B5/145 A61B5/6823 A61B5/6833 A61B5/7455 A61B2562/0219 A61B2562/0247 A61H31/005 A61H31/007 A61H2031/002 A61H2201/5007 A61H2201/5043 A61H2201/5048 A61H2201/5061 A61H2201/5071 A61H2201/5079 A61H2201/5084 A61H2230/04 A61H2230/06 A61H2230/207 A61N1/39044 A61N1/3925 G16H15/00 G16H40/63 H01H2215/004		
优先权	10/609001 2003-06-27 US 10/704366 2003-11-06 US		
其他公开文献	EP2210555A2 EP2210555B1		
外部链接	Espacenet		

摘要(译)

一种用于辅助救助者在受害者的CPR期间执行胸部按压的装置，该装置包括垫或其他结构，该垫或其他结构被配置成施加到救护者施加力以产生胸部按压的位置附近或位置处的胸部，至少一个传感器连接到垫，传感器被配置为感测胸部的运动或施加到胸部的力，处理电路用于处理传感器的输出以确定救助者是否在胸部按压之后基本上释放胸部，并且至少一个提示元件连接到处理电路，用于向救助者提供关于胸部按压后胸部是否基本上被释放的信息。一种在应用CPR期间分析ECG信号的方法，该方法减少了由CPR胸部按压引起的所述ECG信号中的伪像。

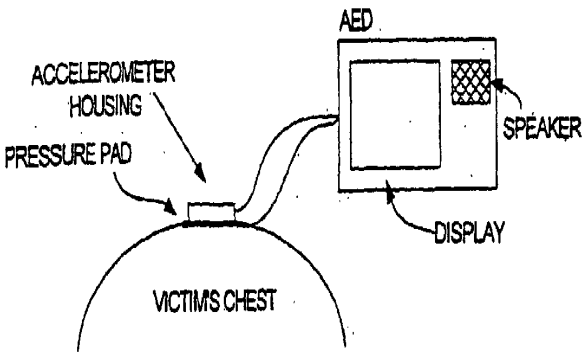

FIG. 1