



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) <b>International Patent Classification</b> <sup>7</sup> : <b>A61H 31/00</b></p>	<p><b>A3</b></p>	<p>(11) <b>International Publication Number:</b> <b>WO 00/27464</b></p> <p>(43) <b>International Publication Date:</b> 18 May 2000 (18.05.00)</p>
<p>(21) <b>International Application Number:</b> PCT/US99/26388</p> <p>(22) <b>International Filing Date:</b> 8 November 1999 (08.11.99)</p> <p>(30) <b>Priority Data:</b> 09/188,211 9 November 1998 (09.11.98) US</p> <p>(71) <b>Applicant:</b> EMERGENCY MEDICAL SYSTEMS, INC. [US/US]; 775 Palomar Avenue, Sunnyvale, CA 94086 (US).</p> <p>(72) <b>Inventors:</b> HALPERIN, Henry, R.; Johns Hopkins Hospital, Traylor 905, 720 Rutland Avenue, Baltimore, MD 21287 (US). BERGER, Ronald; Johns Hopkins Hospital, Traylor 905, 720 Rutland Avenue, Baltimore, MD 21287 (US).</p> <p>(74) <b>Agent:</b> CROCKETT, K., David; Crockett &amp; Fish, 22362 Rosebriar, Mission Viejo, CA 92962 (US).</p>		<p>(81) <b>Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report.</i></p> <p>(88) <b>Date of publication of the international search report:</b> 10 August 2000 (10.08.00)</p>
<p>(54) <b>Title:</b> CPR CHEST COMPRESSION MONITOR</p>		
<p>(57) <b>Abstract</b></p>		
<p>Chest compressions are measured and prompted to facilitate the effective administration of CPR. A displacement detector (12) produces a displacement indicative signal indicative of the displacement of the CPR recipient's chest toward the recipient's spine. A signaling mechanism (18) provides chest compression indication signals directing a chest compression force being applied to the chest and a frequency of such compressions. An automated controller (28) and an automated constricting device (59) may be provided for applying CPR to the recipient in an automated fashion. The automated controller (28) receives the chest compression indication signals from the signaling mechanism (18). In accordance with the chest compression indication signals, it controls the force and frequency of constrictions. The system (10) may be provided with a tilt compensator (16) comprising a tilt sensor mechanism (24, 25) outputting a tilt compensation signal indicative of the extent of tilt of the device, and may be further provided with an adjuster (S10) for adjusting the distance value in accordance with the tilt compensation signal. An ECG signal processor may be provided which removes the CPR-induced artifact from a measured ECG signal obtained during the administration of CPR.</p>		

*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakistan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/26388

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(7) :A61H 31/00 US CL :601/41 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 600/495, 496, 587; 601/41, 44, 107, 108, 134; 607/5, 124, 133		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Extra Sheet.		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,496,257 A (KELLY) 05 March 1996, entire document.	1, 6-9, 12.
---		-----
Y		2-5, 10, 11, 13-18
Y	US 4,424,806 A (NEWMAN et al.) 10 January 1984, entire document.	10, 11, 17, 18
Y	US 4,928,674 A (HALPERIN et al.) 29 May 1990, Fig. 1.	2, 13
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 07 MAY 2000	Date of mailing of the international search report <b>09 JUN 2000</b>	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer <i>Justin Yu</i> JUSTINE YU Telephone No. (703) 308-2675	

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US99/26388

**B. FIELDS SEARCHED**

Electronic data bases consulted (Name of data base and where practicable terms used):

EAST

Search Terms: displacement and tilt\$ and (sensor or detector) and (cpr or cardiopulmonary adj1 resuscitat\$),  
displacement with converter and accelerometer.