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 Class Subclass
 ISSUE CLASSIFICATION

5749905

UTILITY SERIAL NUMBER 07/691755 PATENT DATE MAY 12 1998 PATENT NUMBER

SERIAL NUMBER FILING DATE CLASS SUBCLASS GROUP ART UNIT EXAMINER
 07/691755 05/12/98 607 007 3305 Schuetzle

APPLICANTS
 LINER, BELLEVUE, WA; THOMAS D. Lyster, BOTHELL, WA;
 COLE, KIRKLAND, WA; DANIEL J. POWERS, BAINBRIDGE ISLAND, WA;
 MORGAN, BAINBRIDGE ISLAND, WA.

SEARCHING DATA*****
 THIS APPLN IS A CON OF 08/103,837 08/06/93 A8N

RELATED APPLICATIONS***** none

NOTE-DISCLAIMER
 The term of this patent shall not extend beyond the expiration date of Pat. No. 5,601,612.

ISSUING LICENSE GRANTED 09/27/96 ***** SMALL ENTITY *****

Foreign priority claimed 35 USC 119 conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	AS FILED	STATE OR COUNTRY WA	SHEETS DRWGS. 7	TOTAL CLAIMS 1	INDEP. CLAIMS 1	FILING FEE RECEIVED \$375.00	ATTORNEY'S DOCKET NO. 93-003US1C1
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ADDRESS
 SHAY
 DEAN INC
 DEPARTMENT SUITE 300
 FOURTH AVENUE
 WA 98121

ISSUE FEE IN FILE

TITLE
 THERAPY METHOD AND APPARATUS utilizing Patient Dependent Electrical
 meters
 2-12-98 U.S. DEPT. OF COMM./PAT. & TM—PTO-436L (Rev.12-94)

PARTS OF APPLICATION FILED SEPARATELY		Applications Examiner 2/20	
NOTICE OF ALLOWANCE MAILED 218.98		Kennedy J. Schuetzle Assistant Examiner	
ISSUE FEE Amount Due 200 Date Paid 2/27/98		WILLIAM E. KAMM PRIMARY EXAMINER ART UNIT 335	
Label Area		Primary Examiner PREPARED FOR ISSUE	
		DRAWING Sheets Drwg. 7 Figs. Drwg. 11 Print Fig. 6	
		CLAIMS ALLOWED Total Claims 11 Print Claim 1	
		ISSUE BATCH NUMBER 664	

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Form PTO-436A Rev. 8/92

ISSUE FEE IN FILE

08/691755

PATENT APPLICATION



08691755

APPROVED FOR LICENSE

INITIALS SEP 09 96 45

Date Entered or Counted

CONTENTS

Date Received or Mailed

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Date Entered or Counted	Description	Date Received or Mailed
	1. Application <i>Prints</i> papers.	
	2. <i>Pre Amdt. A</i>	<i>8-2-96</i>
	3. <i>Pre Amdt. B</i>	<i>8-2-96</i>
	4. <i>T.D.S.</i>	<i>10-2-96</i>
	5. <i>Req 3 mo</i>	<i>12-30-96^{AS}</i>
	6. <i>T.D.S.</i>	<i>4-7-97</i>
<i>10/31</i>	7. <i>Final Req 3 mo</i>	<i>11-3-97</i>
	8. <i>T.D.S.</i>	<i>11-10-97</i>
<i>11/2/98</i>	9. <i>Amdt & cnc</i>	<i>11-17-97</i>
	10. <i>Petition Granted</i>	<i>1-13-98</i>
<i>11/29</i>	11. <i>Advisory Op.</i>	<i>1-29-98</i>
	12. <i>Term. Discl.</i>	<i>1/29/98</i>
	13. <i>Allow</i>	<i>2-18-98</i>
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SEARCHED

Class	Sub.	Date	Exmr.
607	4 5 6 7 8 2 39 40 42 43-46 48 50 58 62 74	12-18-96	<i>JA</i>
607	4-8 2 39 40 42-46 48 50 58 62 74	10-28-97	<i>JA</i>
607	4-8 2 39 40 42-46 48 50 58 62 74	2-12-98	<i>JA</i>

SEARCH NOTES

	Date	Exmr.
Search update of present case search	12-18-96	<i>JA</i>
Search update of 12-18-96 update	10-28-97	<i>JA</i>
Search update of 10-28-97 update	2-12-98	<i>JA</i>

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
607	4-8 2 39 40 42-46 48 50 58 62 74	2-12-98	<i>JA</i>

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POSITION	ID NO.	DATE
CLASSIFIER	45	9-8-96
EXAMINER	46/4	9-18-96
TYPIST	357	09/20/96
VERIFIER	851	9-27
CORPS CORR.		
SPEC. HAND		
FILE MAINT.		
DRAFTING		

INDEX OF CLAIMS

Claim	Date		
	Final	Original	
1		12-20-78	
2		1-27-79	
3		2-12-98	
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SYMBOLS
 ✓..... Rejected
 -..... Allowed
 - (Through numeral) Canceled
 +..... Restricted
 N..... Non-elected
 I..... Interference
 A..... Appeal
 O..... Objected

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US005749905A

United States Patent [19]
Gliner et al.

[11] **Patent Number:** **5,749,905**
[45] **Date of Patent:** ***May 12, 1998**

- [54] **ELECTROTHERAPY METHOD UTILIZING PATIENT DEPENDENT ELECTRICAL PARAMETERS**
- [75] **Inventors:** **Bradford E. Gliner, Bellevue; Thomas D. Lyster, Bothell; Clinton S. Cole, Kirkland; Daniel J. Powers; Carlton B. Morgan, both of Bainbridge Island, all of Wash.**
- [73] **Assignee:** **Heartstream, Inc., Seattle, Wash.**
- [*] **Notice:** The term of this patent shall not extend beyond the expiration date of Pat. No. 5,601,612.

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(List continued on next page.)

Primary Examiner—William E. Kamm
Assistant Examiner—Kennedy J. Schaetzle
Attorney, Agent, or Firm—James R. Shay; Cecily Anne Snyder

- [21] **Appl. No.:** **691,755**
- [22] **Filed:** **Aug. 2, 1996**

Related U.S. Application Data

- [63] **Continuation of Ser. No. 103,837, Aug. 6, 1993, abandoned.**
- [51] **Int. Cl.⁶** **A61N 1/39**
- [52] **U.S. Cl.** **607/7; 607/14**
- [58] **Field of Search** **607/4, 5, 6, 7, 607/8, 2, 39, 40, 42, 43-46, 48, 50, 58, 62, 74**

[57] **ABSTRACT**

This invention provides an external defibrillator and defibrillation method that automatically compensates for patient-to-patient impedance differences in the delivery of electrotherapeutic pulses for defibrillation and cardioversion. In a preferred embodiment, the defibrillator has an energy source that may be discharged through electrodes on the patient to provide a biphasic voltage or current pulse. In one aspect of the invention, the first and second phase duration and initial first phase amplitude are predetermined values. In a second aspect of the invention, the duration of the first phase of the pulse may be extended if the amplitude of the first phase of the pulse fails to fall to a threshold value by the end of the predetermined first phase duration, as might occur with a high impedance patient. In a third aspect of the invention, the first phase ends when the first phase amplitude drops below a threshold value or when the first phase duration reaches a threshold time value, whichever comes first, as might occur with a low to average impedance patient. This method and apparatus of altering the delivered biphasic pulse thereby compensates for patient impedance differences by changing the nature of the delivered electrotherapeutic pulse, resulting in a smaller, more efficient and less expensive defibrillator.

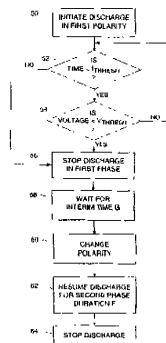
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11 Claims, 7 Drawing Sheets



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