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(72) Inventor: **Landesberg, Amir
Haifa (IL)**

(74) Representative: **Molnia, David
Dörries Frank-Molnia Pohlman,
Triftstrasse 13
80538 München (DE)**

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(71) Applicant: **Levram Medical Devices, Ltd.
Nesher 36601 (IL)**

(54) **Single cannula ventricular-assist apparatus**

(57) A system for assisting the failing ventricle, which utilizes a single blood displacement chamber and a single cannula. The cannula is inserted into the failing ventricle cavity and is connected to a blood displacement actuator. The device produces blood displacement at a critical time for a critical duration and with blood flow time course such that it improves the systolic function of the heart: augments the cardiac output and increases the generated pressure. The device also improves the

diastolic function by increasing the ventricle compliance and imposing rapid relaxation of the ventricle wall. The device provides additional external work without deteriorating the mechanical function of the failing ventricular, moreover it decreases the energy consumption of the failing heart and improves the coronary perfusion. Consequently, the device improves the balance between the energy supply (coronary perfusion) to the ventricle wall and the mechanical demands, and allows recovery of the failing heart.

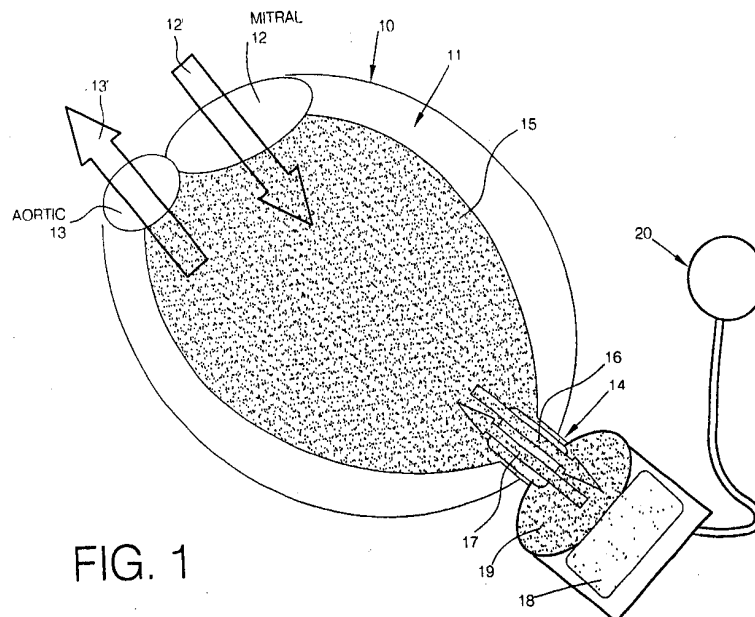


FIG. 1



European Patent Office

PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention EP 02 01 0964 shall be considered, for the purposes of subsequent proceedings, as the European search report

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 305 745 A (ZACOUTO FRED) 26 April 1994 (1994-04-26) * column 39, line 22 - line 41; figure 13 *	1,11	A61M1/10 A61M1/12
A	GB 2 347 085 A (VASCOR INC) 30 August 2000 (2000-08-30) * claims 16-19 *	1,11	
A	FR 1 437 458 A (ZACOUTO FRED) 6 May 1966 (1966-05-06) * the whole document *	11-26	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A61M
INCOMPLETE SEARCH			
<p>The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.</p> <p>Claims searched completely : 1, 11-26</p> <p>Claims searched incompletely :</p> <p>Claims not searched : 2-10</p> <p>Reason for the limitation of the search: Article 52 (4) EPC - Method for treatment of the human or animal body by surgery</p>			
Place of search		Date of completion of the search	Examiner
THE HAGUE		7 October 2003	Villeneuve, J-M
CATEGORY OF CITED DOCUMENTS			
<p>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</p> <p>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</p>			

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

EP 02 01 0964

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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[标]申请(专利权)人(译)	LEVRAM医疗器械		
申请(专利权)人(译)	LEVRAM医疗器械, LTD.		
当前申请(专利权)人(译)	LEVRAM医疗器械, LTD.		
[标]发明人	LANDESBERG AMIR		
发明人	LANDESBERG, AMIR		
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优先权	09/858343 2001-05-16 US		
其他公开文献	EP1258259A2		
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摘要(译)

一种用于辅助失败的心室的系统，其利用单个血液置换室和单个套管。将插管插入发生故障的心室腔并连接到血液置换致动器。该装置在临界持续时间和血流时间过程的临界时间产生血液置换，从而改善心脏的收缩功能：增加心输出量并增加产生的压力。该装置还通过增加心室顺应性和强制心室壁的快速松弛来改善舒张功能。该装置提供额外的外部工作而不会使衰竭的心室的机械功能恶化，而且它降低了衰竭心脏的能量消耗并改善了冠状动脉灌注。因此，该装置改善了能量供应（冠状动脉灌注）与心室壁之间的平衡和机械需求，并且允许恢复衰竭的心脏。

