



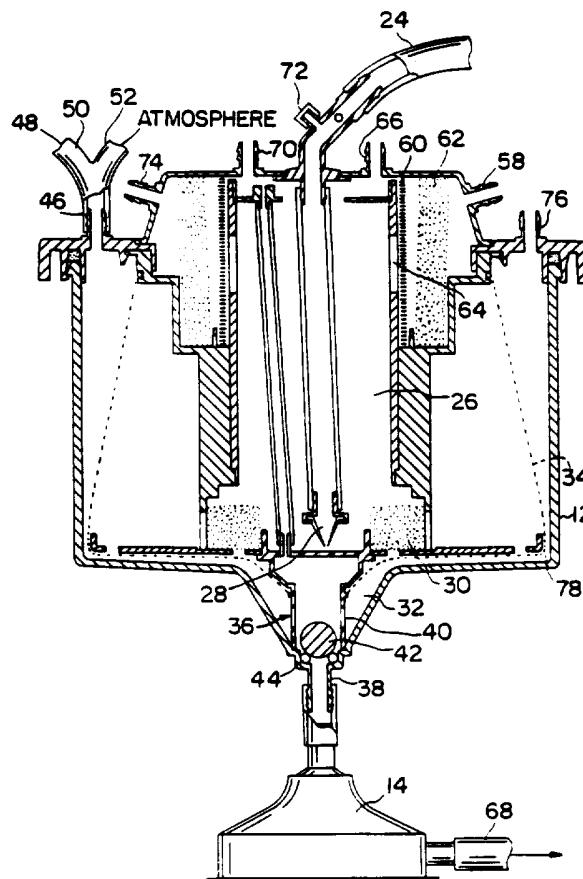
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification⁶ : A61M 1/36</p>	<p>A3</p>	<p>(11) International Publication Number: WO 96/24397</p> <p>(43) International Publication Date: 15 August 1996 (15.08.96)</p>
<p>(21) International Application Number: PCT/US96/01673</p> <p>(22) International Filing Date: 8 February 1996 (08.02.96)</p> <p>(30) Priority Data: 08/385,264 8 February 1995 (08.02.95) US</p> <p>(71) Applicant: MEDTRONIC, INC. [US/US]; 7000 Central Avenue N.E., Minneapolis, MN 55432 (US).</p> <p>(72) Inventor: DONOVAN, D., Peterson; 2715 Silver View Drive, Long Lake, MN 55356 (US).</p> <p>(74) Agents: KINGHORN, Curtis, D. et al.; Medtronic, Inc., 7000 Central Avenue N.E., Minneapolis, MN 55432 (US).</p>		<p>(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p>(88) Date of publication of the international search report: 10 October 1996 (10.10.96)</p>

(54) Title: PERFUSION SYSTEM

(57) Abstract

A perfusion system incorporating a sealed reservoir in communication with a pump which allows any negative pressure at the suction inlet of the pump to be communicated into the reservoir and thereby communicated to any lines connected to the sealed reservoir. The sealed reservoir provides filtration and defoaming elements. An oxygenator and a heat exchanger may be connected to the outlet of the pump to prepare the blood for return to the patient. A control system which operates clamps and displays pressure, temperature, fluid level, and other information measured at various points in the perfusion system, is utilized with a perfusion system. In another embodiment, a hard-shell reservoir utilizing an outlet located at the bottom of the reservoir, said outlet having integral to that outlet a floating ball valve, to where the valve will be opened if there is fluid in the reservoir and closed if no fluid exists in the reservoir.



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INTERNATIONAL SEARCH REPORT

Inter national Application No
PCT/US 96/01673

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61M1/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61M

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,5 158 533 (STRAUSS ET AL.) 27 October 1992	1-3,7-9, 13,14, 17,18
Y	see column 8, line 62 - column 10, line 49; figures	4,5,10, 11,15, 16,19
X	---	
X	EP,A,0 583 148 (COBE LABORATORIES INC.) 16 February 1994 see page 3, line 20 - line 48; figure 1	1-3,12, 13
X,P	---	
X,P	DE,A,43 26 886 (BOCK) 16 February 1995 see claims 1,2,5,7; figure 1	1,7-9, 12-14

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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- * '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.
- * '&' document member of the same patent family

Date of the actual completion of the international search

13 August 1996

Date of mailing of the international search report

21. 08. 96

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 96/01673

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US,A,5 411 706 (HUBBARD ET AL.) 2 May 1995 see column 2, line 40 - column 3, line 1; figure 1	1-3,11, 17,18
X	--- EP,A,0 320 815 (DIDECO SPA) 21 June 1989 see claim 11; figure	19
Y	--- US,A,5 270 005 (RAIBLE) 14 December 1993 see abstract; figure 6	11,15,16
Y	--- US,A,4 131 431 (SIPOSS GEORGE G) 26 December 1978 see claim 1; figure 1	10,19
Y	--- US,A,3 896 733 (ROSENBERG) 29 July 1975 see column 6, line 28 - line 32; claim 13; figure 2	4,5,23 10,19
X	see column 5, line 26 - column 6, line 15	20,21,24
A	--- US,A,4 490 331 (STEG) 25 December 1984	1-3, 7-10,14, 15,17-19
X	--- US,A,5 188 604 (ORTH JEFFREY L) 23 February 1993 see column 8, line 16 - line 56; figure 1	20,25, 26,29
Y	--- US,A,3 890 969 (FISCHEL HALBERT) 24 June 1975 see column 4, line 11 - line 14; figure 1	23
X	--- US,A,5 039 482 (PANZANI IVO ET AL) 13 August 1991 see column 3, line 11 - line 20; figure	20,22
X	--- US,A,5 382 227 (RIQUIER JEAN-CLAUDE) 17 January 1995 see column 4, line 6 - column 5, line 2; figure 2	20,27,28

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 96/01673

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Subject No.1 : Claims 1-18 Perfusion system with sealed reservoir
Subject No.2 : Claims 19 Perfusion system with low level valve
Subject No.3 : Claims 20-29 Control system for perfusion system

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

...information on patent family members

International Application No

PCT/US 96/01673

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 96/01673

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