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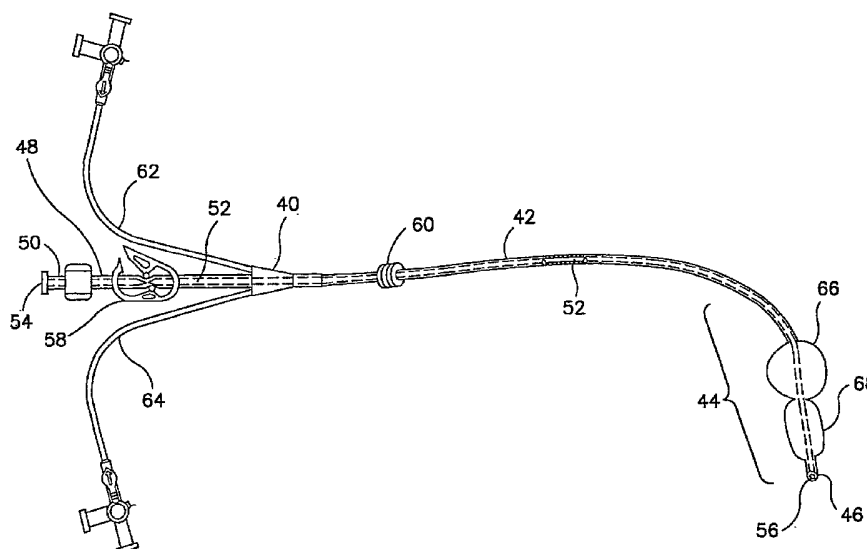
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[Continued on next page]

(54) Title: GLOBAL MYOCARDIAL PERFUSION CATHETER



(57) Abstract: A catheter (40, 40A, 40B) and method for retrograde perfusion of the heart through the coronary sinus is provided. In one embodiment, the catheter (40, 40A, 40B) has a pair of separate balloons (66, 66A, 66B, 68, 68A, 68B) that are located side-by-side on its distal end (44, 44A, 44B) and that can be positioned and expanded on opposite sides of the coronary sinus ostium. to anchor the catheter to the coronary sinus and to form an occlusive seal of the coronary sinus adjacent its ostium. Alternatively, a single asymmetric "dumbbell" or "hourglass" shaped balloon can be used such that one portion of the balloon inflates in the right atrium, and thereafter, the other portion of the balloon is inflated at a location crossing the ostium. and extends into the coronary sinus to occlude the ostium through radial expansion against the sinus at the ostium. The catheter and its method of use provide a tighter seal and improve distribution of cardioplegia and/or other substances, such as drugs or gene therapy vectors, to the myocardium.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/30463

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61M 29/00

US CL : 604/96.01

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)

U.S. : Please See Continuation Sheet

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)
EAST (catheter, cannula, sinus. balloon, cardioplegia)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,648,384 A (SCHMUKLER) 10 March 1987, Figs. 6-6A	1-3, 6, 7, 9, 10, 15-18, 21-25, 27-31, 33-35
Y	US 6,500,145 A (BICAKCI et al) 31 December 2002, see specification	20

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

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"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

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Continuation of B. FIELDS SEARCHED Item 1:

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