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(54) Title: **HYPERTHERMIA DEVICES AND THEIR USES WITH NANOPARTICLES**

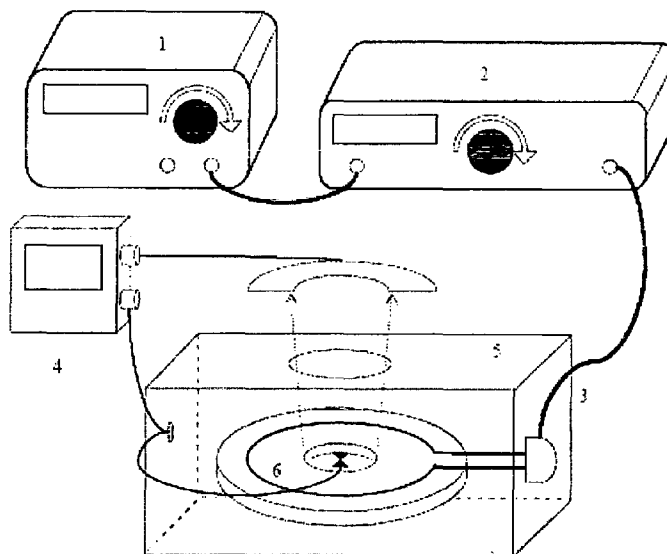


Figure 2

(57) Abstract: A hyperthermia device comprising a generator of radio-frequency electromagnetic fields, an amplifier of this signal, a transmitter of the electromagnetic field generated, and a direct temperature measurement system is disclosed for use with one or more nanoparticles capable of dissipating the energy of the applied electromagnetic field in the form of heat and it being possible to directly control the temperature of said nanoparticles.

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FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,
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A. CLASSIFICATION OF SUBJECT MATTER INV. A61N1/40 A61K41/00 A61K9/51		
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) A61N A61K		
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) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2007/027620 A (THERM MED LLC [US]; KANZIUS JOHN [US]) 8 March 2007 (2007-03-08) paragraphs [0032], [0033], [0050], [0063], [0099], [0101] - [0107], [0114]	1-8,10, 12-14,20
X	US 2006/171894 A1 (TAKEYAMA TOSHIHISA [JP]) 3 August 2006 (2006-08-03) paragraphs [0008], [0010], [0032] - [0035], [0044], [0054], [0058], [0068], [0115], [0140], [0146], [0147], [0156]	1,4, 7-14,20
X	US 5 411 730 A (KIRPOTIN DMITRI [US] ET AL) 2 May 1995 (1995-05-02) column 15, line 24 - column 16, line 16 -/--	1,2,4,7, 8,12-14, 20
<input checked="" type="checkbox"/>	Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> 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	*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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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)	*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.	
O document referring to an oral disclosure, use, exhibition or other means	*Z* document member of the same patent family	
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 20 February 2009	Date of mailing of the international search report 27/02/2009	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Link, Tatiana	

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/090732 A1 (IVKOV ROBERT [US] ET AL) 28 April 2005 (2005-04-28)	1-4, 7, 8, 12-14, 20
Y	paragraphs [0019], [0024], [0041], [0053], [0072], [0078], [0101], [0119] - [0121], [0133], [0144], [0146], [0169]; claim 24	11
X	US 2007/168001 A1 (XIANG XIAO-DONG [US] ET AL) 19 July 2007 (2007-07-19)	1, 3-7, 13, 14
Y	paragraphs [0024], [0069] - [0072]	6
Y	US 2006/015159 A1 (FLORES GLEN P [US] ET AL FLORES GLEN PATRICK [US] ET AL) 19 January 2006 (2006-01-19)	6
	paragraphs [0013], [0030], [0045]	
Y	WO 03/022360 A (TRITON BIOSYSTEMS INC [US]) 20 March 2003 (2003-03-20)	11
	page 37, lines 24, 25 page 58, line 17 - page 59, line 20	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2008/002780

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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.: 15-19, 21-24
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007027620	A	08-03-2007	AU 2006284974 A1 08-03-2007
			CA 2620795 A1 08-03-2007
			EP 1933940 A1 25-06-2008
			US 2007250139 A1 25-10-2007
US 2006171894	A1	03-08-2006	AU 2006209654 A1 03-08-2006
			EP 1842554 A1 10-10-2007
			WO 2006080243 A1 03-08-2006
US 5411730	A	02-05-1995	NONE
US 2005090732	A1	28-04-2005	CA 2543923 A1 19-05-2005
			EP 1682212 A2 26-07-2006
			JP 2007521109 T 02-08-2007
			WO 2005044365 A2 19-05-2005
US 2007168001	A1	19-07-2007	WO 2007061843 A2 31-05-2007
US 2006015159	A1	19-01-2006	US 2006293729 A1 28-12-2006
WO 03022360	A	20-03-2003	CA 2453676 A1 20-03-2003
			EP 1409077 A2 21-04-2004
			JP 2005523736 T 11-08-2005
			US 2003032995 A1 13-02-2003