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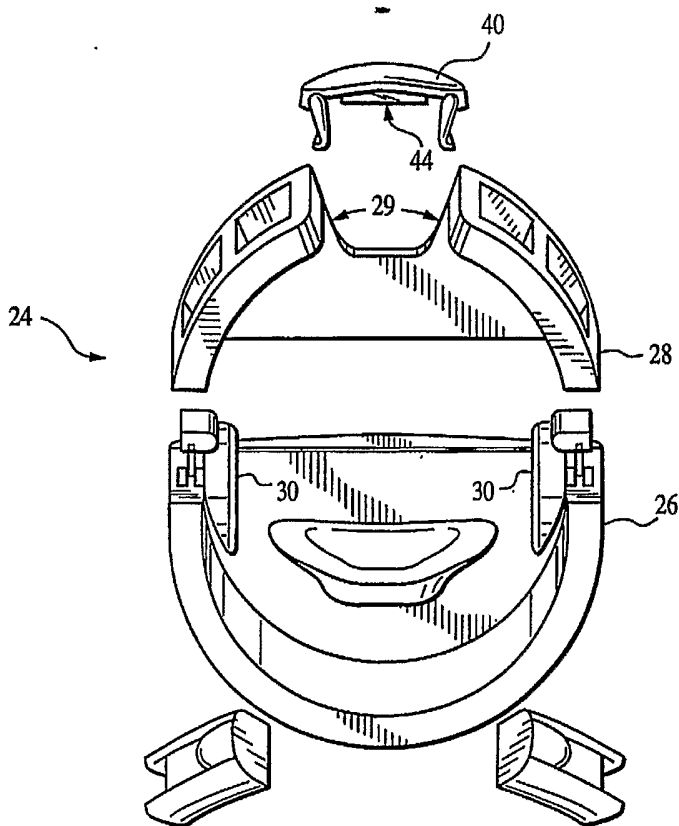
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[Continued on next page]

(54) Title: A CAVITY RESONATOR FOR MR SYSTEMS



(57) Abstract: An magnetic resonance apparatus in embodiments of the invention may include one or more of the following features: a) a coil (#24) having at least two sections (#26 and #28), (b) the at least two sections (#26 and #28) having a resonant circuit, (c) the at least two sections being wirelessly coupled or decoupled, (d) the at least two sections being separable, (e) several openings allowing a subject to see and be accessed through the coil (#29), (f) at least one cushioned head restraint (#31), and (g) a subject input/output device (#40) providing visual data from in front and behind of the coil respectively; wherein the input-output device is selected from a group consisting of mirrors, prisms, video monitors, LCD devices, and optical motion trackers.



**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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27 May 2004

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/15880

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>																	
IPC(7) : G01V 3/00																	
US CL : 324/318																	
According to International Patent Classification (IPC) or to both national classification and IPC																	
<b>B. FIELDS SEARCHED</b>																	
Minimum documentation searched (classification system followed by classification symbols) U.S. : 324/318, 324/307, 324, 309, 324/322																	
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE																	
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) US, EPO, JPO and DERWENT																	
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																	
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.															
X	US 5,892,359 A (YUI et al) 6 April 1999 (06.04.1999) columns from 6-9, lines from 44-67 to 1-10 respectively.	25-32															
X	US 6,316,941 B1 (FUJITA et al) 13 November 2001 (13.11.2001) from column 5 lines 57-67 to column 6, lines 1-13.	25-32															
Y	US 5,134,373 A (TSURUNO et al) 28 July 1992 (28.07.1992) from column 3, lines 5-68 to column 4, lines 1-67.	25-32															
Y	US 5,877,732 A (ZIARATI) 2 March 1999 (02.03.1999) from column 14, lines 47-67 to column 15, lines 1-30.	25-32															
Y,E	US 6,591,128 B1 (WU et al) 8 July 2003 (08.07.2003), from column 5, lines 15-67 to column 10, lines 1-29.	25-32															
X	US 6,433,548 B1 (FURUTA et al) 13 August 2002 (13.08.2002) from column 6, lines 36-67 to column 8, lines 1-34.	25-32															
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.																	
* Special categories of cited documents: <table style="width: 100%; border: none;"> <tr> <td style="width: 40%; border: none;">"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td style="width: 10%; border: none;">"T"</td> <td style="border: none;">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</td> </tr> <tr> <td style="border: none;">"E" earlier application or patent published on or after the international filing date</td> <td style="border: none;">"X"</td> <td style="border: none;">document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td style="border: none;">"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)</td> <td style="border: none;">"Y"</td> <td style="border: none;">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</td> </tr> <tr> <td style="border: none;">"O" document referring to an oral disclosure, use, exhibition or other means</td> <td style="border: none;">"&amp;"</td> <td style="border: none;">document member of the same patent family</td> </tr> <tr> <td style="border: none;">"P" document published prior to the international filing date but later than the priority date claimed</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> </table>			"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	"E" earlier application or patent published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"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	"&"	document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed		
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"P" document published prior to the international filing date but later than the priority date claimed																	
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230		Authorized officer Diego Gutierrez <i>Shawn S. Hyspe</i> Telephone No. (703) 305-0956															

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/15880

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

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

1.  Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claim 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.  Claim 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:  
Please See Continuation Sheet

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.: 25-32

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING**

1. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:
  - a. Group I does not require a head restraint and means for audio communications as required on Group II, an input/output device as required on group III.
  - b. Group II does not require an input/output device as required on group III.
2. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.
  - a. Group I, claim(s) 1-14, 33-45 and 46-48, drawn to a MR apparatus comprising a coil with at least two sections being wirelessly coupled and having an electrical circuit.
  - b. Group II, claim(s) 15-24, drawn to a MR apparatus comprising a coil having at least a head restraint and means for audio communications.
    - c. Group III, claim(s) 25-32, drawn to a MR apparatus comprising an input/output device.