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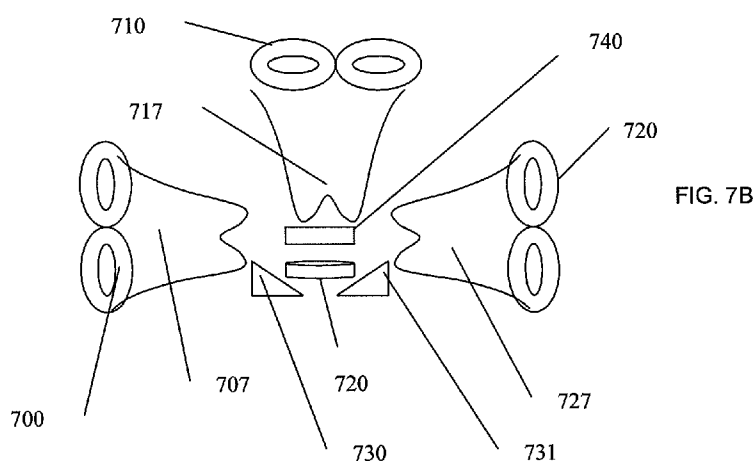
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(54) Title: FOCUSING MAGNETIC FIELDS WITH ATTRACTOR MAGNETS AND CONCENTRATOR DEVICES



(57) Abstract: Described herein are Transcranial Magnetic Stimulation (TMS) systems and methods configured to focus the applied magnetic fields generated by one or more primary TMS electromagnets using attractor magnets and/or magnetic concentrators having high-permeability regions. An attractor magnet is typically a secondary, phase-complimentary magnet that is configured to shape the field of the primary TMS electromagnet. A magnetic concentrator typically includes a region of high magnetic permeability that may shape a TMS magnetic field. Attractor magnets and concentrator devices can be used independently or in combination. The profile of the TMS field can be made narrower or wider than for an unfocused field using these devices, systems and methods.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61N2/02 A61N2/00

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

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 , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	GB 2 271 931 A (SACKS BENJAMIN ISRAEL [GB]; RUDOLF NOEL [GB]) 4 May 1994 (1994-05-04) page 2, paragraph 2 - page 3, paragraph 4; figures 3,4 -----	1-11,13, 16
X	US 4 889 526 A (RAUSCHER ELIZABETH A [US] ET AL) 26 December 1989 (1989-12-26) column 30, lines 36-52; figures 3,5 -----	1,2, 4-10,13, 16
X	WO 00/78267 A (MEDICAL BRACING SYSTEMS LTD [IL]; OSTROW ALVIN S [IL]; TANNENBAUM JOSE) 28 December 2000 (2000-12-28) page 11, paragraph 1; claims 1,8,9; figure 3B ----- -/-	1,2,4,5, 8-10,13



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents

¹A¹ document defining the general state of the art which is not considered to be of particular relevance

¹E⁻ earlier document but published on or after the international filing date

"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)

¹O^{*} document referring to all oral disclosure use, exhibition or other means

"P¹" document published prior to the international filing date but later than the priority date claimed

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"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

¹Y⁻ 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

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International application No

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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	EP 0 501 048 A (LTI IMD USA INC [US]) 2 September 1992 (1992-09-02)	9, 12-16
Y	page 3, lines 5-16 page 7, line 50 - page 8, line 2; figure 20	10, 11
X	US 5 441 495 A (LIBOFF ABRAHAM R [US] ET AL) 15 August 1995 (1995-08-15)	1, 2, 4, 5, 8
Y	column 3, lines 47-62; figure 6 column 6, lines 35-37 column 9, lines 18-27	10
Y--	US 5 707 334 A (YOUNG ROBERT B [US]) 13 January 1998 (1998-01-13) figure 1	11
X	wo 2004/087255 A (MO SEUNG-KEE [KR]) 14 October 2004 (2004-10-14) page 31, line 20 - page 34, line 1; figures 4B, 4C	9, 13-15
X	EP 0 788 813 A (NIHON KOHDEN CORP [JP]) 13 August 1997 (1997-08-13) column 7, lines 40-55; figure 5A	9, 12, 13
X	wo 2007/050592 A (NEURONETICS INC [US]) 3 May 2007 (2007-05-03) paragraphs [0081] , [0082] ; figure 6	9, 12, 13
X	US 6 042 531 A (HOLCOMB ROBERT R [US]) 28 March 2000 (2000-03-28) column 21, line 44 - column 22, line 37; figure 2	1, 2, 4, 5, 8
A	wo 98/56302 A (LIGHT SCIENCES LP [US]) 17 December 1998 (1998-12-17) the whole document	9, 14, 15

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.: 17-26
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

PCT/US2008/075575

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2271931	A	04-05-1994	NONE	
US 4889526	A	26-12-1989	NONE	
WO 0078267	A	28-12-2000	AU 5099100 A CA 2377962 A1 EP 1194185 A2 JP 2003518959 T	09-01-2001 28-12-2000 10-04-2002 17-06-2003
EP 0501048	A	02-09-1992	NONE	
US 5441495	A	15-08-1995	AU 645511 B2 AU 5978990 A CA 2021506 A1 DE 4026173 A1	20-01-1994 21-02-1991 18-02-1991 21-02-1991
US 5707334	A	13-01-1998	US 5833600 A	10-11-1998
WO 2004087255	A	14-10-2004	AU 2003235315 A1	25-10-2004
EP 0788813	A	13-08-1997	DE 69725484 D1 DE 69725484 T2 US 5984854 A	20-11-2003 15-07-2004 16-11-1999
WO 2007050592	A	03-05-2007	AU 2006306352 A1 CA 2627513 A1 EP 1948307 A2	03-05-2007 03-05-2007 30-07-2008
US 6042531	A	28-03-2000	US 6280376 B1	28-08-2001
WO 9856302	A	17-12-1998	AU 7166698 A US 5921244 A	30-12-1998 13-07-1999