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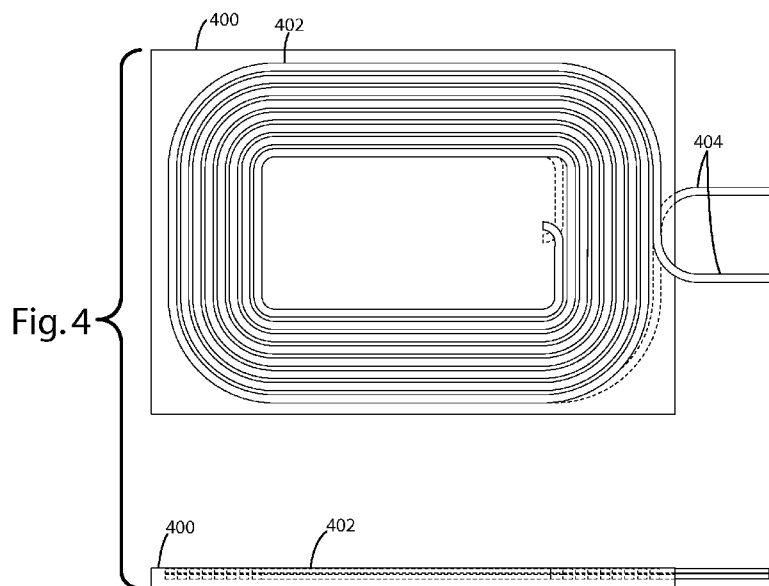
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[Continued on next page]

(54) Title: FLUX CONCENTRATOR AND METHOD OF MAKING A MAGNETIC FLUX CONCENTRATOR



(57) Abstract: A flux concentrator and method for manufacturing a flux concentrator is provided. The method can include combining powdered soft magnetic material, a binder, a solvent, an internal lubricant; mixing the materials to create a mixture, evaporating the solvent from the mixture, molding the mixture to form a flux concentrator, and curing the flux concentrator. The flux concentrator may be laminated and broken into multiple pieces, which makes the flux concentrator more flexible. Breaking the flux concentrator does not significantly affect the magnetic properties. Since the permeability of the binder is very similar to that of air, adding tiny air gaps between the fractions is not significantly different than adding more binder.

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ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No PCT/US2010/046611

A. CLASSIFICATION OF SUBJECT MATTER
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 ADD.
 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)
 H01F

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	EP 1 947 660 A2 (SONY ERICSSON MOBILE COMM JP [JP]; SEIKO EPSON CORP [JP]) 23 July 2008 (2008-07-23) page 9, paragraph 53 page 10, paragraph 61 page 12, paragraph 70 - page 13, paragraph 77 -----	1-6,8
X	US 2008/061733 A1 (TOYA SHOICHI [JP]) 13 March 2008 (2008-03-13) page 3, paragraphs 26,28 page 6, paragraph 60 - page 7, paragraph 63 -----	1-8
A	GB 1 480 134 A (HITACHI METALS LTD) 20 July 1977 (1977-07-20) page 1, lines 10-31,52-57 page 4, lines 46-52 -----	7

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	"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 document but 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	

Date of the actual completion of the international search 7 February 2011	Date of mailing of the international search report 28/04/2011
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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 Gols, Jan
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/046611

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.:
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 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:

see additional 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 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.:

1-8

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8

A flux concentrator assembly including including a permanent magnet, wherein said flux concentrator assembly includes an insulator between said magnet and said flux concentrator for minimizing effects of AC field saturation caused by said permanent magnet.

2. claims: 9-16

A flexible flux concentrator assembly a flux concentrator wherein in response to bending said flux concentrator, said flux concentrator is capable of being broken into a plurality of pieces with air gaps therebetween.

3. claims: 17-20

A flux concentrator, wherein said flux concentrator has a saturation 500 mT or greater.

4. claims: 21-24

A wireless power module comprising: a flux concentrator and wireless power circuitry surface mounted to said flux concentrator surface, wherein said coil is electrically connected to said wireless power circuitry through traces embedded in said flux concentrator.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2010/046611

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
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