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- (72) Inventor; and
- (71) Applicant: PARTOVI, Afshin [US/US]; 1063 Morse Avenue, #5-100, Sunnyvale, CA 94089 (US).
- (74) Agents: KENNA, Karl, F. et al.; Fliesler Meyer LLP, 650 California Street, Fourteenth Floor, San Francisco, CA 94108 (US).
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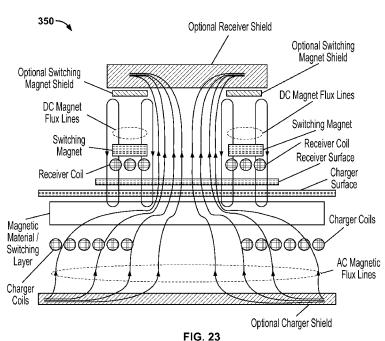
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(54) Title: SYSTEMS AND METHODS FOR PROVIDING POSITIONING FREEDOM, AND SUPPORT OF DIFFERENT VOLTAGES, PROTOCOLS, AND POWER LEVELS IN A WIRELESS POWER SYSTEM



multiple devices with a wireless power charger system are also described. Applications include beam shaping, beam forming, phase array radar, beam steering, etc. and inductive charging and power, and particularly usage in mobile, electronic, electric, lighting, or other devices, batteries, power tools, kitchen, industrial applications, vehicles, and other usages. Embodiments of the invention can also be applied generally to power supplies and other power sources and chargers, including systems and methods for improved ease of use and compatibility and transfer of wireless power to mobile, electronic, electric, lighting, or other devices, batteries, power tools, kitchen, milit-

ary, industrial applications and/or vehicles.

(57) Abstract: Systems and methods for modi-

fying the magnitude and/or phase of an electromagnetic field in one or multiple dimensions.

Applications for use in charging or powering

International application No. **PCT/US2012/021729**

A. CLASSIFICATION OF SUBJECT MATTER

H02J 17/00(2006.01)i

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)

H02J 17/00; H01F 38/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & Keywords: wireless power, magnet, modify, magnitude, phase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2000-341885 A (MATSUSHITA ELECTRIC WORKS LTD) 08 December 2000 See the abstract; paragraph [0020]; figure 7.	1-18,20-24,26-39 19,25
Y A	US 2010-0244584 A1 (AZANCOT YOSSI et al.) 30 September 2010 See the abstract; claims 1,11; figures 11,12a,12b.	19,25 1-18,20-24,26-39
A	JP 2003-045731 A (NEC TOKIN CORP) 14 February 2003 See the abstract; paragraphs [0002]-[0010]; claim 1; figures 1,2.	1-39
A	JP 2009-200174 A (PANASONIC ELECTRIC WORKS CO LTD) 03 September 2009 See the abstract; claim 1; figure 1.	1-39

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See patent family annex.

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- "P" document published prior to the international filing date but later than the priority date claimed
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Date of the actual completion of the international search

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Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea

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Authorized officer

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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JP 2000-341885 A 08.1	Patent family member(s) 2.2000 None 9.2010 AU 2008–30	Publicat date	ion
US 2010-0244584 A1 30.0	9.2010 AU 2008-30		
	CA 2702164 CN 1020170 EP 2206129 JP 2011-00 JP 2011-50 KR 10-2010	4 A1 16.04. 031 A 13.04. 0 A2 14.07. 30418 A 10.02. 01633 A 06.01. 0-0082008 A 15.07. 0-0087712 A 05.08. 179424 A1 16.07. 219183 A1 02.09. 219693 A1 02.09. 259401 A1 14.10. 147768 A2 16.04.	2009 2011 2010 2011 2011 2010 2010 2009 2010 2010
JP 2003-045731 A 14.0	2.2003 None		
JP 2009-200174 A 03.0	9.2009 EP 2246864 KR 10-2010 TW 2009374 US 2010-03 WO 2009-10	0-0121644 A 18.11. 466 A 01.09. 320843 A1 23.12.	2010 2009 2010