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Boys et al.

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(54) MULTI POWER SOURCED ELECTRIC VEHICLE

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(2006.01)

(52) U.S. Cl.

USPC 336/84 C

(58) Field of Classification Search See application file for complete search history.

(56)References Cited

U.S. PATENT DOCUMENTS

| 4,873,677 | A | 10/1989 | Sakamoto et al. |
|-----------|----|---------|-----------------|
| 5,469,036 | A | 11/1995 | Eto |
| 5,528,113 | A | 6/1996 | Boys et al. |
| 5,710,502 | A | | Poumey |
| 5,821,638 | A | 10/1998 | Boys et al. |
| 6,501,364 | B1 | 12/2002 | Hui et al. |
| 6,906,495 | B2 | 6/2005 | Cheng et al. |
| 6,934,167 | B2 | 8/2005 | Jang et al. |
| | | | |

FOREIGN PATENT DOCUMENTS

| JР | 03-239136 | 10/1991 |
|----|-----------|---------|
| JР | 06-64393 | 9/1994 |
| JP | 6-66206 | 9/1994 |
| JP | 06-277358 | 10/1994 |
| JP | 6-86321 | 12/1994 |
| JР | 8-238326 | 9/1996 |
| | | |

(Continued)

OTHER PUBLICATIONS

Notice of Reasons for Rejection in corresponding Japanese application p2010-507347 (Original and English Translation).

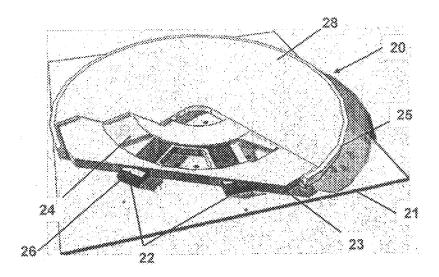
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(57)**ABSTRACT**

An inductive power transfer (IPT) pad and system for the charging of electric and hybid electric vehicles. The batter of such a vehicle can be selectively coupled to a high power electrical supply for fast charging or a lower power electrical supply for charging using IPT. The batteries of the vehicles are used in a system to control the load demand in an electricity network through variations of the frequency of power supplied.

35 Claims, 5 Drawing Sheets





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| (56) | References Cited FOREIGN PATENT DOCUMENTS | | JP JP | 2002-231545 2002-343655 | 8/2002 11/2002 | |
|----------|---|------------------|----------------|--|----------------------------|--|
| | | | JР JР WO | 2004-47701 T2007-505480 | 2/2004 3/2007 | |
| JP JP | 11-097263 2000-200725 | 4/1999 7/2000 | WO WO WO | WO2005024865 WO2006101285 WO2008051611 | 3/2005 9/2006 5/2008 | |



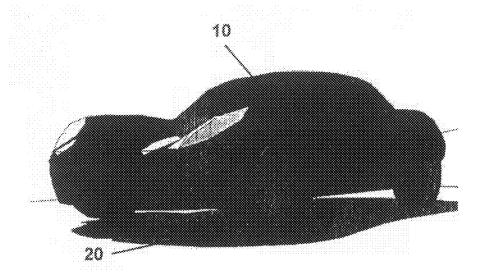


FIGURE 1

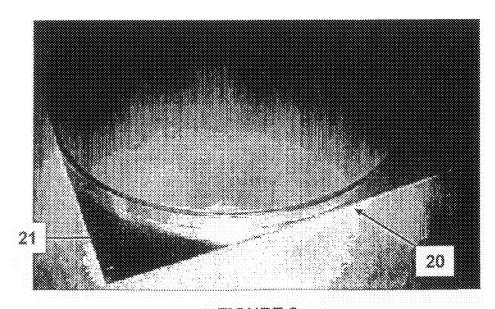
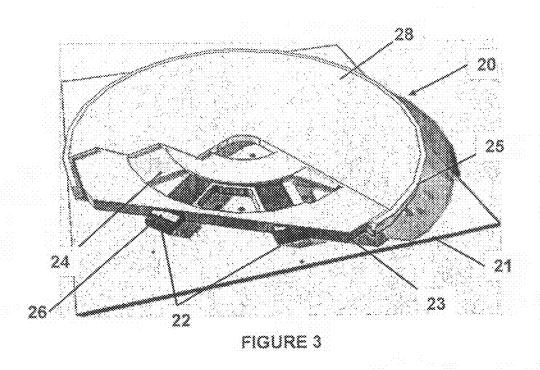
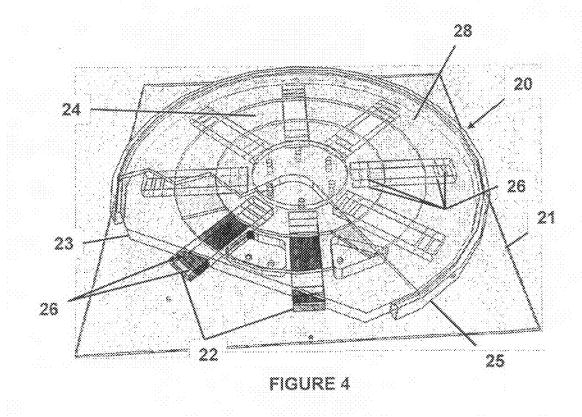


FIGURE 2









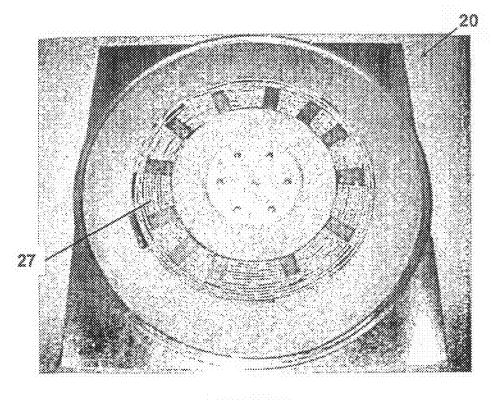


FIGURE 5



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