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**Liu et al.**

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(54) **LOCALIZED CHARGING, LOAD IDENTIFICATION AND BI-DIRECTIONAL COMMUNICATION METHODS FOR A PLANAR INDUCTIVE BATTERY CHARGING SYSTEM**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 585 days.

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(51) **Int. Cl.**  
**H01M 10/46** (2006.01)

(52) **U.S. Cl.** ..... **320/108**

(58) **Field of Classification Search** ..... **320/107, 320/108, 112, 114, 115, 116**  
See application file for complete search history.

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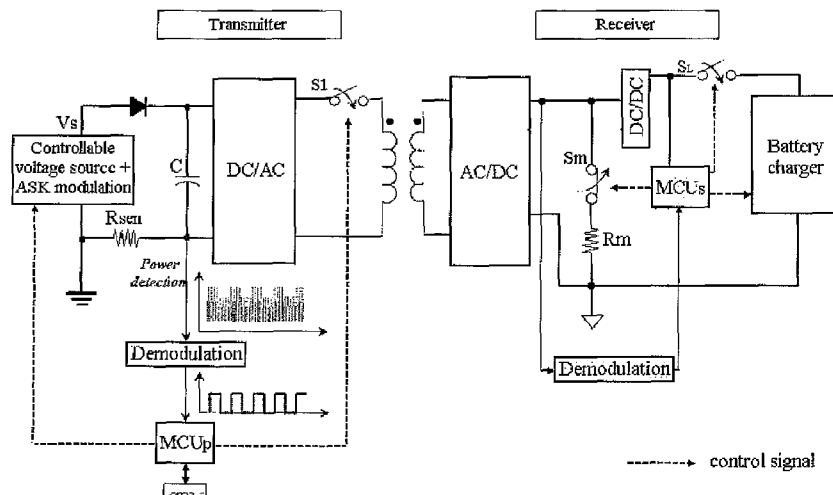
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(57) **ABSTRACT**

Methods and principles are described for systematizing localized charging, load identification and bi-directional communication in a planar battery charging system. Also described is control circuitry for selectively energizing a primary winding when a load is placed on the platform. The optimization of the size of the receiver winding compared to the transmitter winding is discussed, while the associated communication methods include techniques for load identification, compatibility checks, hand-shaking and communication of charging status.

**25 Claims, 7 Drawing Sheets**



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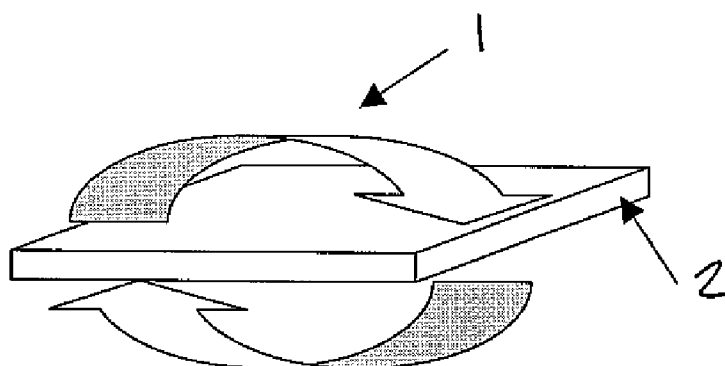


FIG. 1(a)

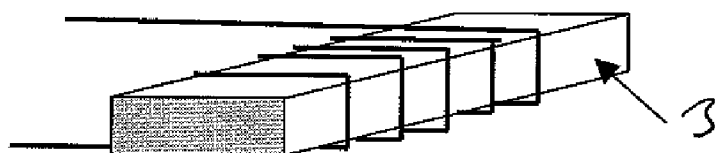


FIG. 1(b)

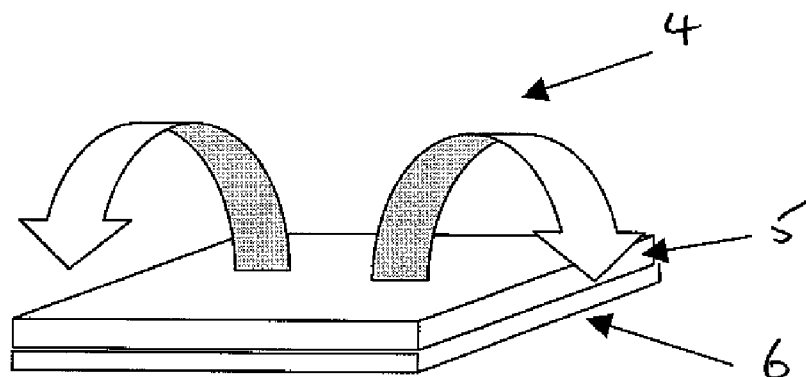


FIG. 2(a)

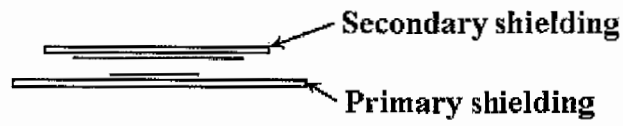


FIG.2(b)

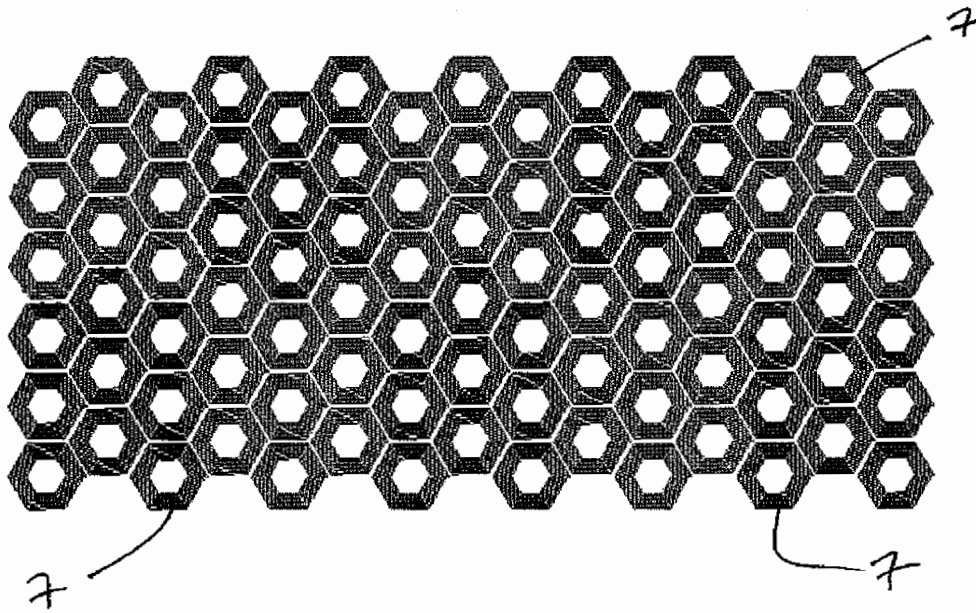


FIG.3

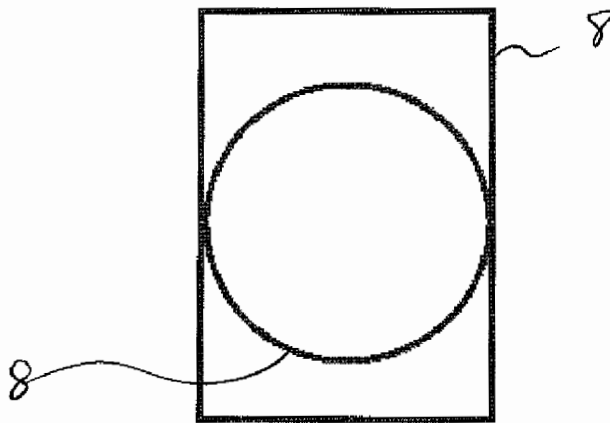


FIG.4

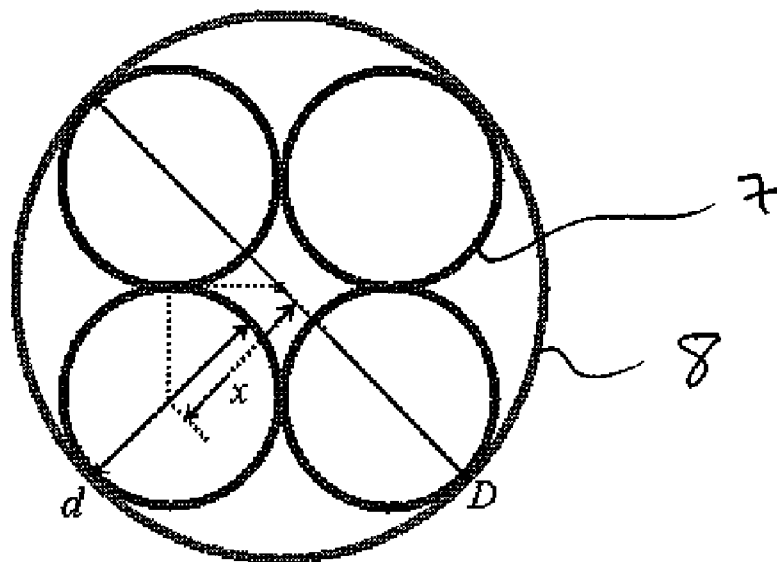


FIG. 5

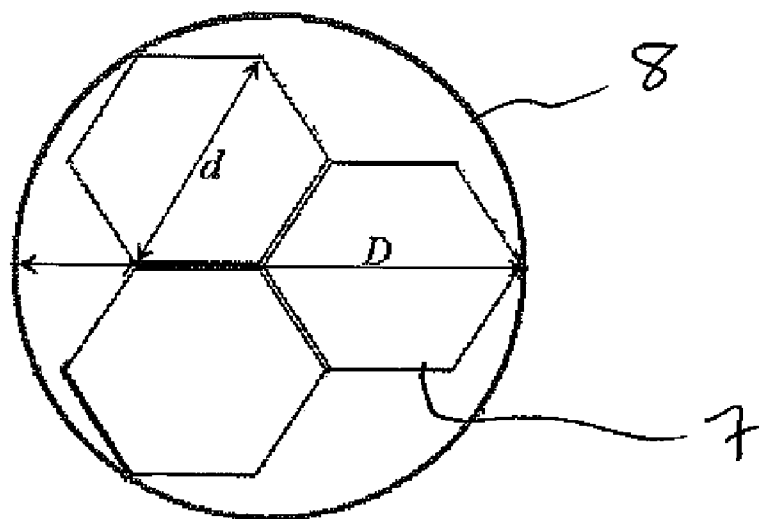


FIG. 6

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