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## (12) United States Patent

### Flowerdew et al.

### (54) INDUCTIVE CHARGING SYSTEM

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- (73) Assignee: Plantronics, Inc., Santa Cruz, CA (US)
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 106 days.
- (21) Appl. No.: 10/882,961
- (22) Filed: Jul. 1, 2004
- (51) Int. Cl. *H02J 7/00* (2006.01)

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## (10) Patent No.: US 7,211,986 B1

### (45) Date of Patent: May 1, 2007

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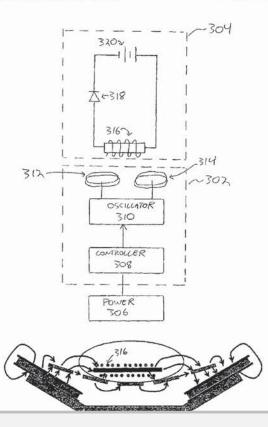
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### (57) ABSTRACT

An apparatus for inductive charging a battery. The apparatus includes a housing with a lower surface and a charging surface. A rechargeable device with a rechargeable battery may be placed on the charging surface. The apparatus further includes a controller for driving an oscillator, wherein the controller receives power from a power source. A first charger coil and second charger coil are disposed within the housing and are coupled to the oscillator. The first charger coil and second charger coil create a substantially horizontal magnetic field in the volume of space above the charging surface.

### 52 Claims, 12 Drawing Sheets



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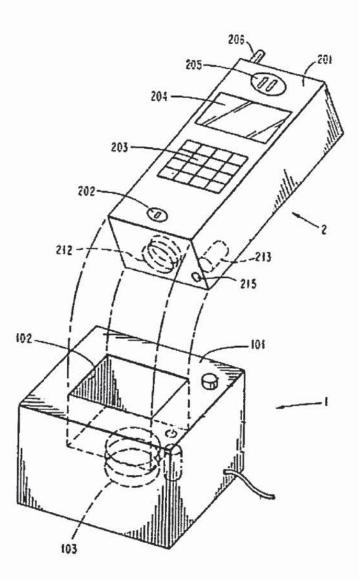


FIGURE I

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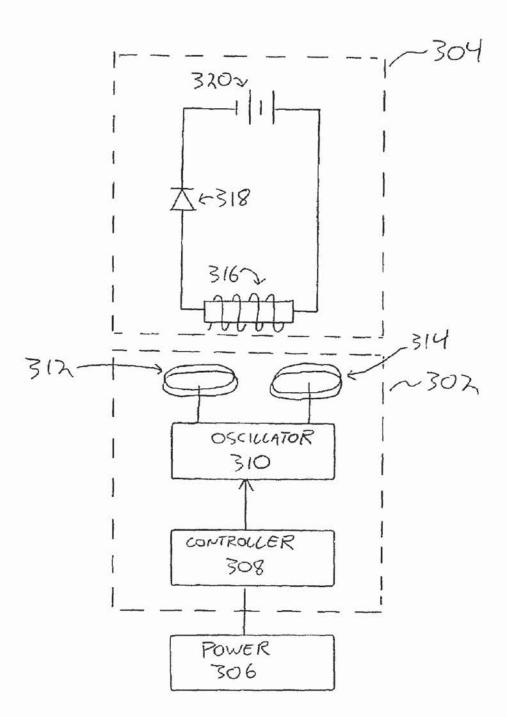


FIGURE Z

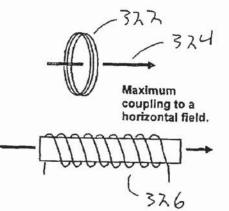
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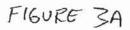
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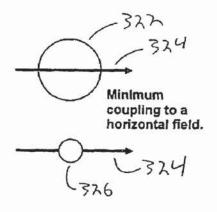
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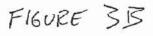
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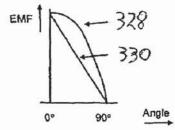


FIGURE 3C

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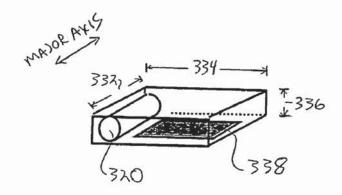


FIGURE 4A

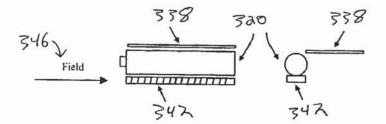


FIGURE 4B

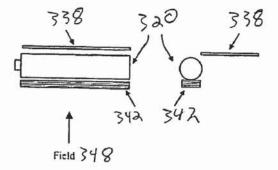


FIGURE 4C.

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