

(12) **United States Patent**  
**Flowerdew et al.**

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(54) **INDUCTIVE 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 106 days.

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(51) **Int. Cl.**  
**H02J 7/00** (2006.01)

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

(58) **Field of Classification Search** ..... 320/107,  
320/108, 110, 112, 113, 114, 115, 116  
See application file for complete search history.

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*Primary Examiner*—Karl Easthom

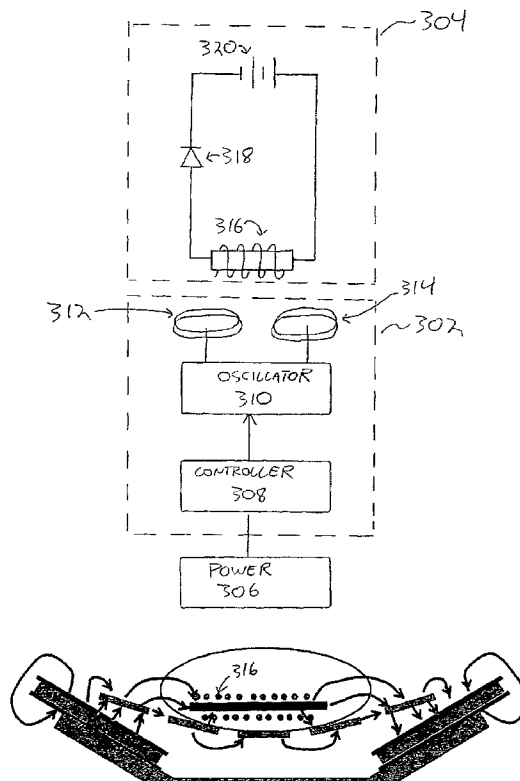
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(57) **ABSTRACT**

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**



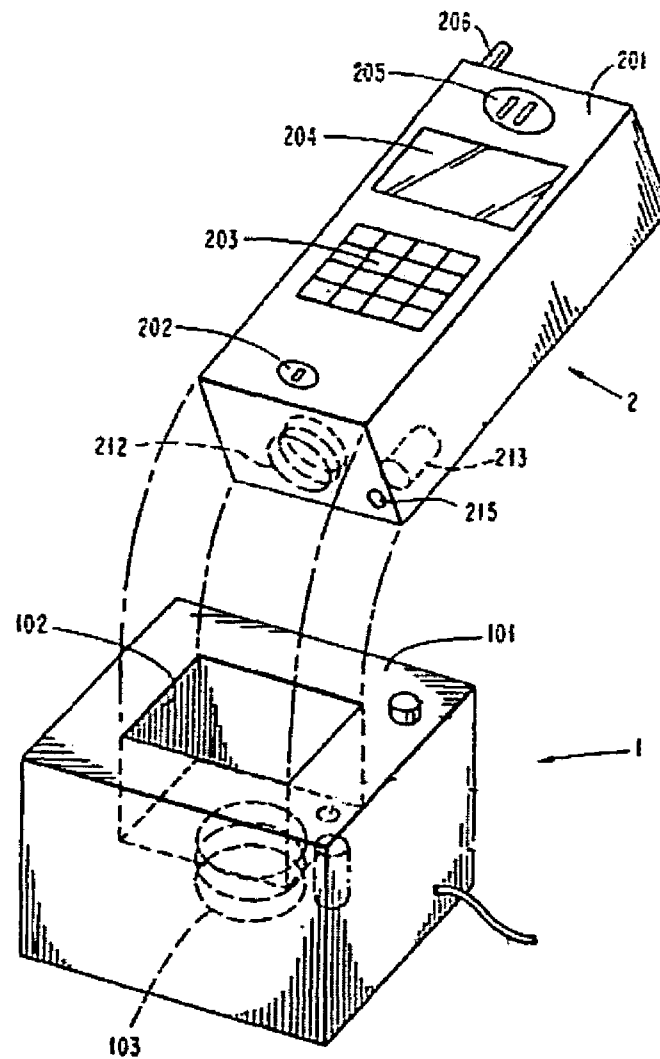


FIGURE 1

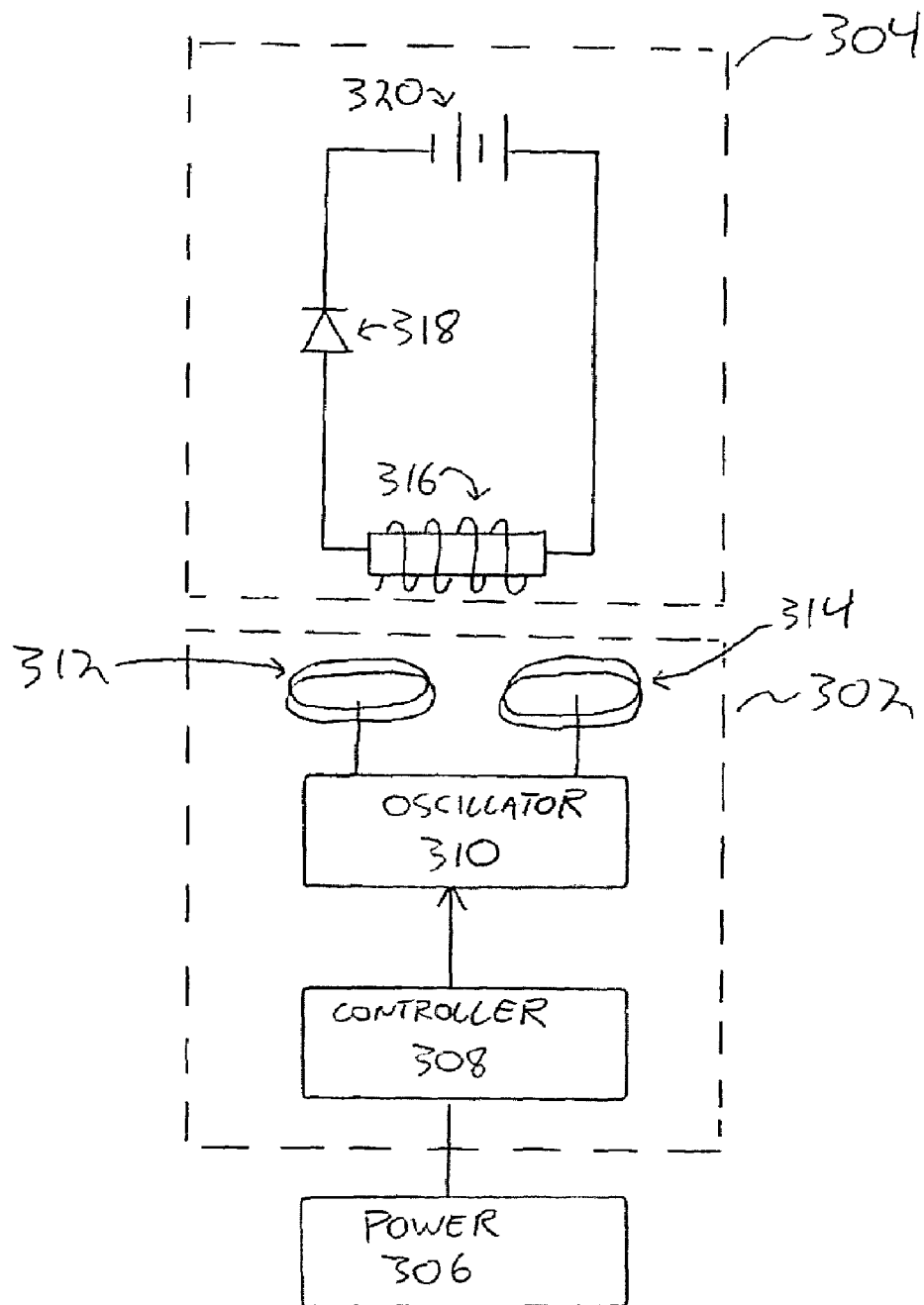


FIGURE 2

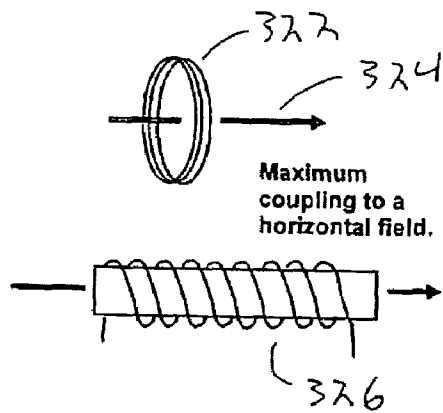


FIGURE 3A

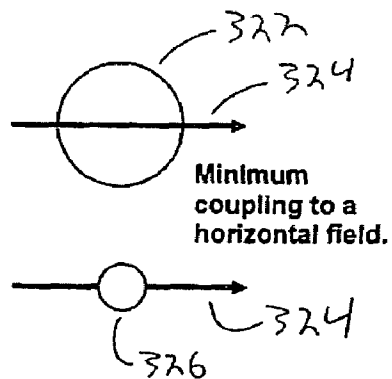


FIGURE 3B

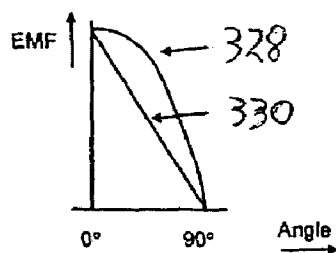


FIGURE 3C

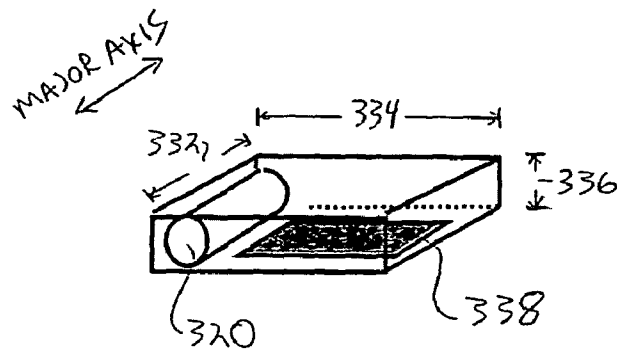


FIGURE 4A

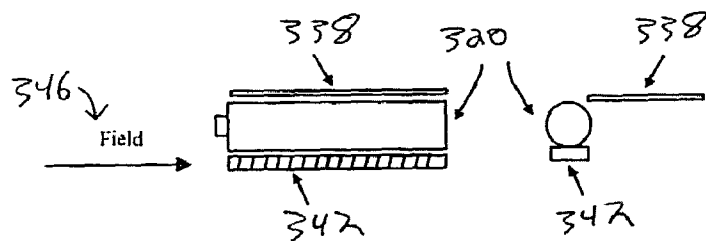


FIGURE 4B

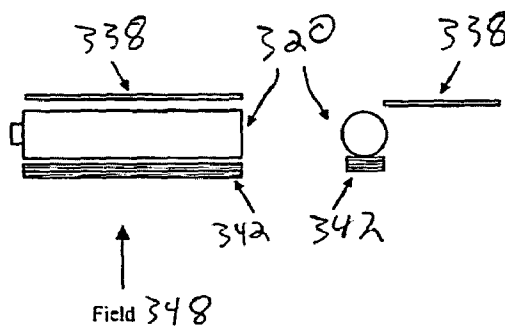


FIGURE 4C

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