[0048] In step **605**, the assembly is integrated into a portable electronic device. Step **605** may include integrating, with the assembly, a power conversion circuit that is configured to power one or more internal electronic components of the portable electronic device with electric currents induced in the first and second inductive coils. The portable electronic device may include a cellular phone, a smartphone, or a tablet computer. In an alternative embodiment, instead of integrating the assembly into the portable electronic device, the assembly is integrated into just a removable cover of a portable electronic device. The removable cover with the assembly may then attached and detached from the portable electronic device.

[0049] In various embodiments, the multiple components of the multi-mode wireless power transfer assembly are integrated into the structure of the portable electronic device or within the removable cover. For example, shields and coils may be mechanically attached (e.g., soldered, screwed, bonded with epoxy, etc.) to a circuit board over the electronic components of the circuit board. In other variations, the shields and coils may be encapsulated in the body of the device or cover (e.g., molded in a thermoplastic casing). In further variations, one or more of the shields and coils are integrated into a sub-component (e.g., battery) of the device. Various embodiments may use a combination of such attachment techniques for the different shields and coils.

[0050] Various types of computers can be used to implement a device such as devices **205**, **207**, and **202** according to various embodiments or to implement processes described herein, such as those described with respect to FIG. **6**. FIG. **7** shows an illustrative device **700** in accordance with example embodiments. Device **700** includes a system bus **701** which may operatively connect various combinations of one or more processors **702**, one or more memories **703** (e.g., random access memory, read-only memory, etc.), mass storage device (s) **704**, input-output (I/O) interfaces **705** and **706**, display interface **707**, and global positioning system (GPS) chip **713**, power interface **714**, and battery **715**. Power interface **714** may include, for example, wired and wireless power transfer circuitry, including assembly **100** if configured to receive wireless power and/or coils **201** and **204** if configured to transmit wireless power.

[0051] Interface **705** may include one or more transceivers **708**, antennas **709** and **710**, and other components for communication in the radio spectrum. Interface **706** and/or other interfaces (not shown) may similarly include a transceiver, one or more antennas, and other components for communication in the radio spectrum, and/or hardware and other components for communication over wired or other types of communication media. Interfaces **705** and **706** may for example perform communications between device **202** and base station devices **205** and **207** for selecting charging modes and for controlling wireless power transfer. GPS chip **713** may include a receiver, an antenna **711** and hardware and/or software configured to calculate a position based on GPS satellite signals.

[0052] Memory **703** and mass storage device(s) **704** may store in a non-transient manner (permanently, cached, etc.), machine executable instructions **712** (e.g., software) executable by the processor(s) **702** for controlling operation of devices **205**, **207**, and **202** as described herein or for performing other processes described herein, such as those illustrated in FIG. **6**.

[0053] Mass storage **704** may include a hard drive, flash memory or other type of non-volatile storage device. Processor(s) **702** may be, e.g., an ARM-based processor such as a Qualcomm Snapdragon or an x86-based processor such as an Intel Atom or Intel Core. Device **700** may also include a touch screen (not shown) and physical keyboard (also not shown). A mouse or keystation may alternately or additionally be employed. A physical keyboard might optionally be eliminated.

[0054] The foregoing description of embodiments has been presented for purposes of illustration and description. The foregoing description is not intended to be exhaustive or to limit embodiments to the precise form explicitly described or mentioned herein. Modifications and variations are possible in light of the above teachings or may be acquired from practice of various embodiments.

1. An apparatus comprising:

a first inductive coil tuned to operate in one or more first modes of inductive wireless power transfer;

a second inductive coil positioned concentrically with the first inductive coil and tuned to operate in one or more second modes of inductive wireless power transfer;

a first magnetic shield comprising a first material having a first magnetic permeability configured to shield an apparatus component when operating in the one or more first modes; and

a second magnetic shield comprising a second material having a second magnetic permeability configured to shield the apparatus component when operating in the one or more second modes.

2. The apparatus of claim **1**, wherein first magnetic shield is positioned in-between the second magnetic shield and the first inductive coil.

3. The apparatus of claim **1**, wherein the first magnetic shield and the second magnetic shield are positioned with a common plane and the second magnetic shield encompasses a perimeter of the first magnetic shield.

4. The apparatus of claim **3**, wherein a first thickness of the first magnetic shield differs from a second thickness of the second magnetic shield.

5. The apparatus of claim **1**, wherein the first magnetic permeability is below 50μ and the second magnetic permeability is above 100μ.

6. The apparatus of claim **1**, wherein the one or more first modes of inductive wireless power transfer include a tightly coupled mode, and the one or more second modes of inductive wireless power transfer include a resonant mode.

7. The apparatus of claim **6**, wherein the one or more first modes of inductive wireless power transfer include a second tightly coupled mode.

8. The apparatus of claim **1**, further comprising a portable electronic device configured to receive power wirelessly via the first inductive coil and the second inductive coil.

9. The apparatus of claim **8**, wherein the portable electronic device includes one of a cellular phone, a smartphone, and a tablet computer.

10. The apparatus of claim **1**, further comprising a removable cover of a portable electronic device, wherein the first inductive coil, the second inductive coil, the first magnetic shield, and the second magnetic shield are attached to the removable cover.

11. A method comprising:

providing a first magnetic shield having a first magnetic permeability;