EXHIBIT 2002

Fig. 1

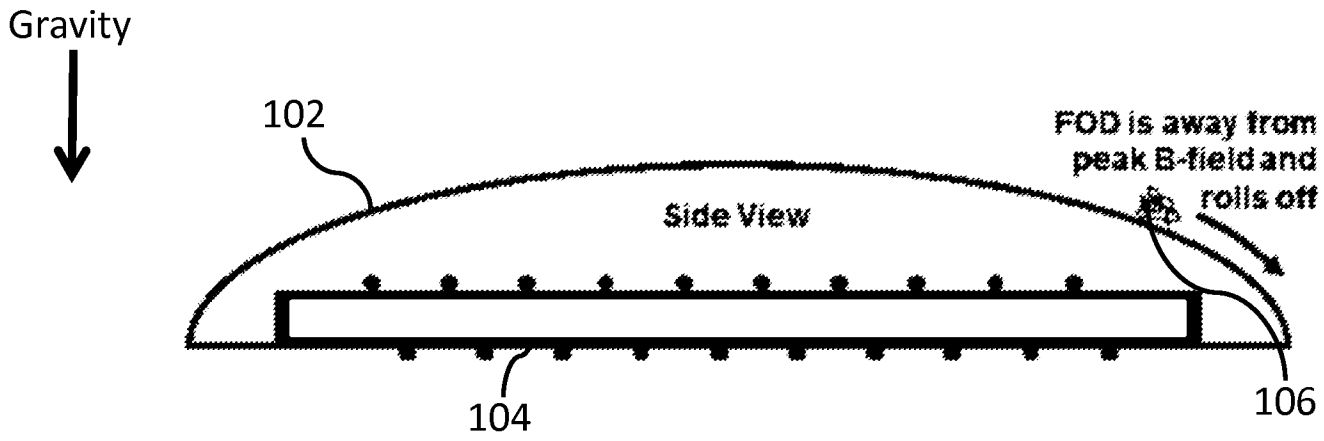

Gravity
102
FOD is away from peak B-field and rolls off
Side View
104
106

Fig. 2

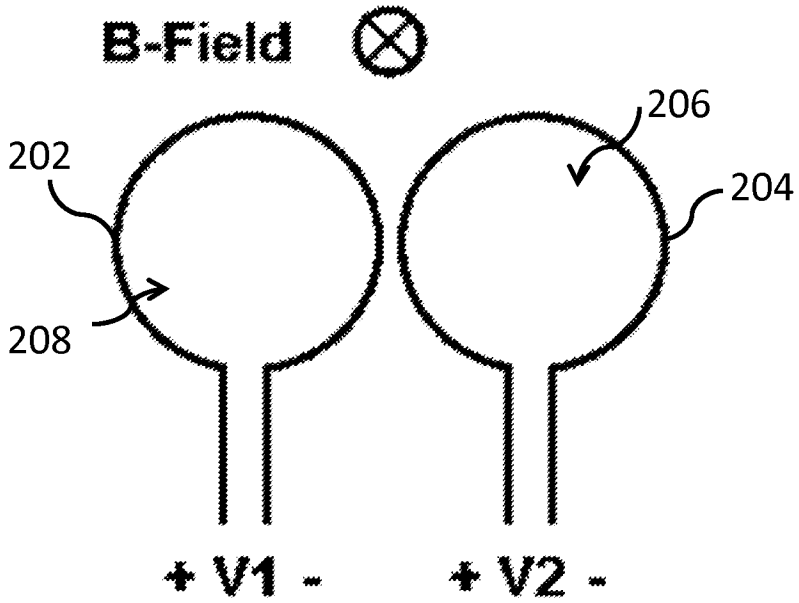


Fig. 3A

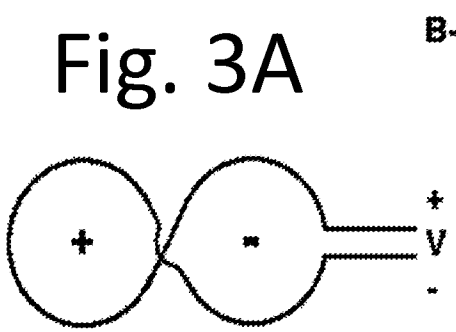
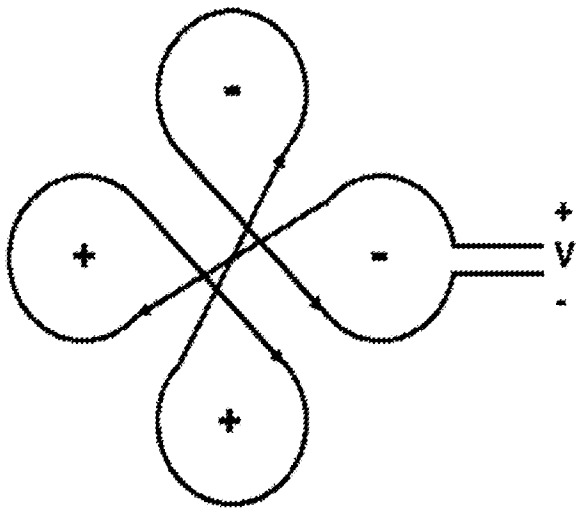


Fig. 3B



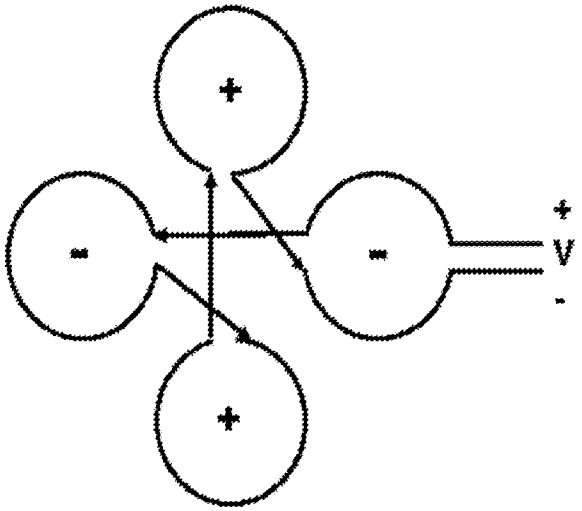


Fig. 3C

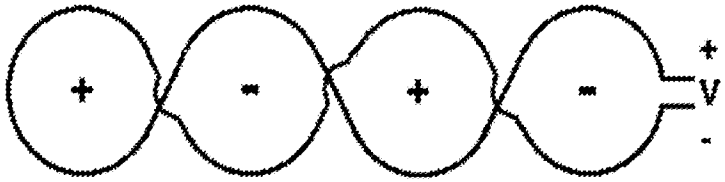


Fig. 3D

Fig. 4A

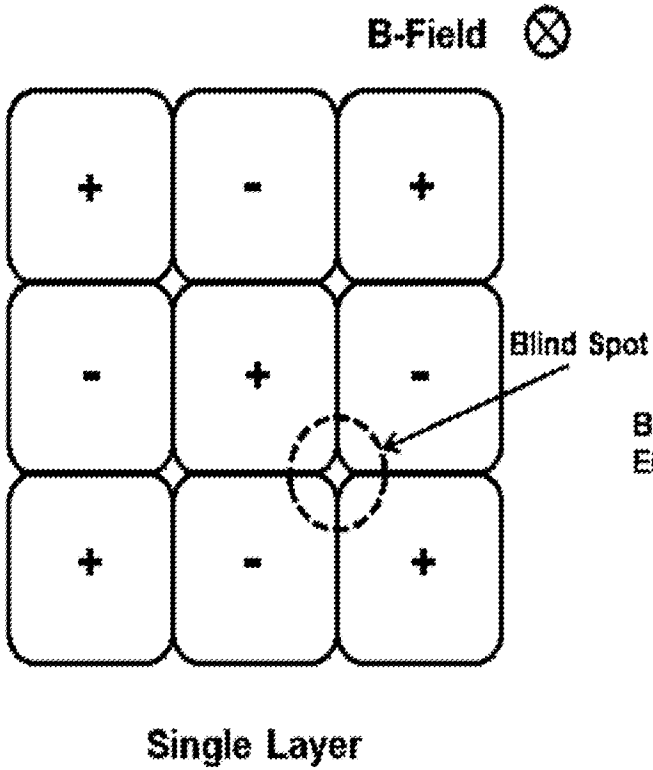

B-Field
+
-
+
-
+
-
+
-
+
Blind Spot
Single Layer

Fig. 4B

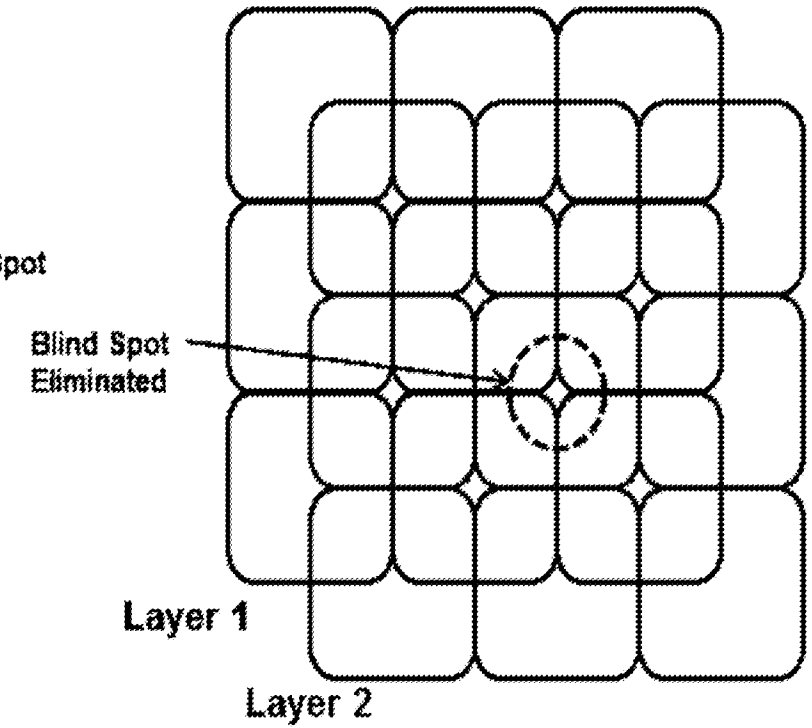

Blind Spot
Eliminated
Layer 1
Layer 2

Fig. 5

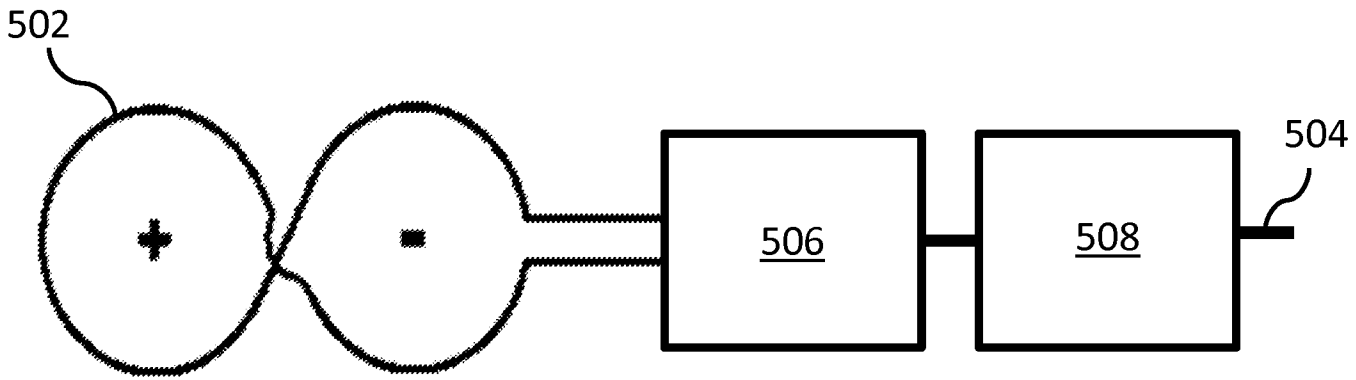


Fig. 6

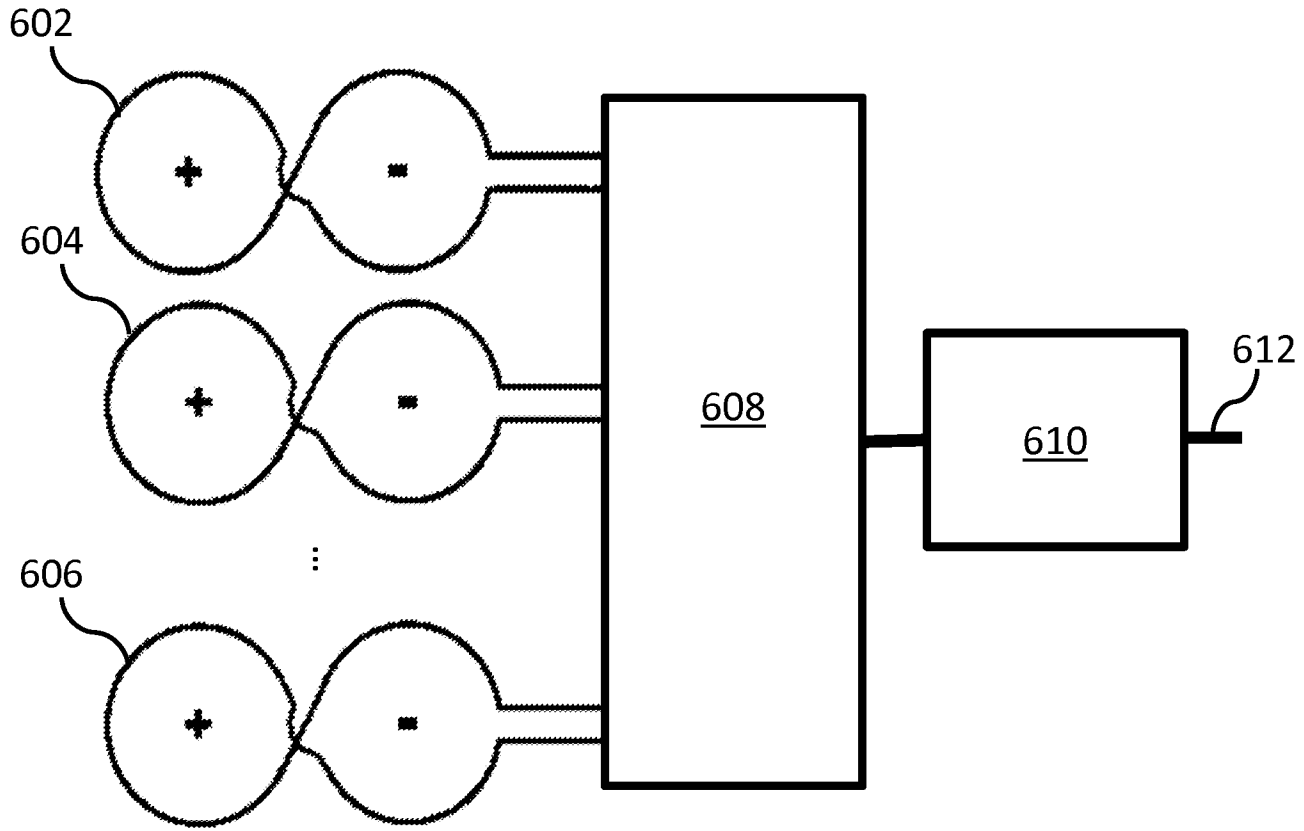


Fig. 7

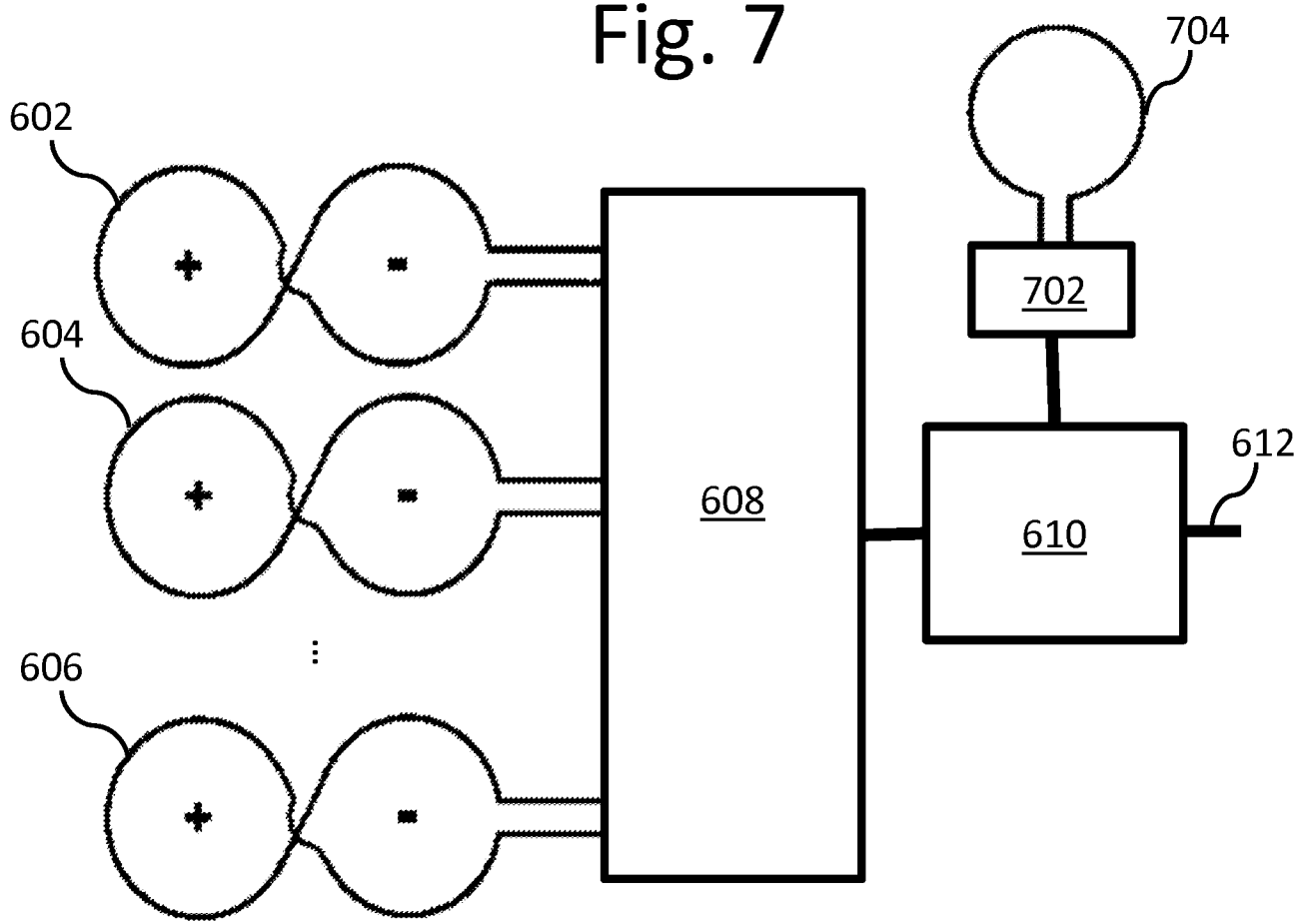
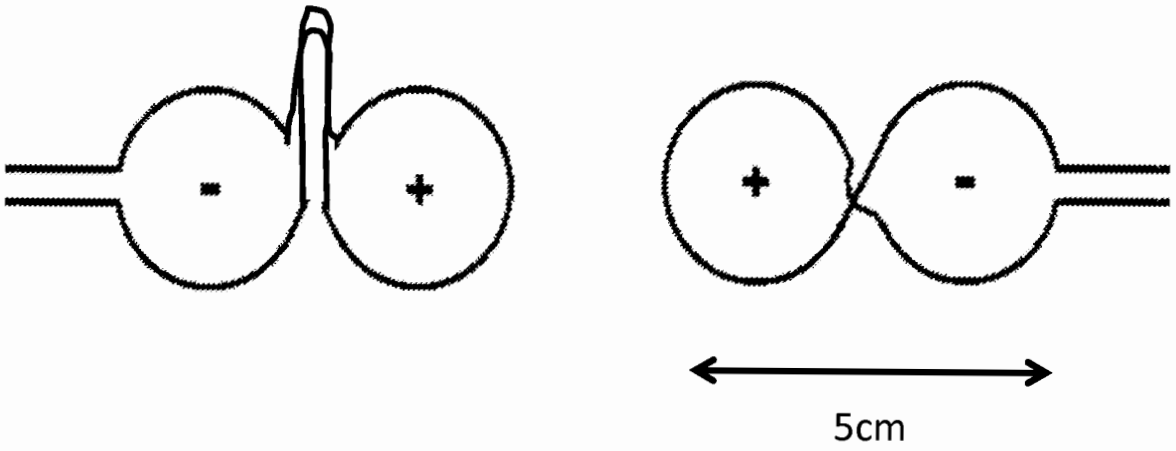


Fig. 8



Gradiometer 1

Gradiometer 2

Fig. 9A

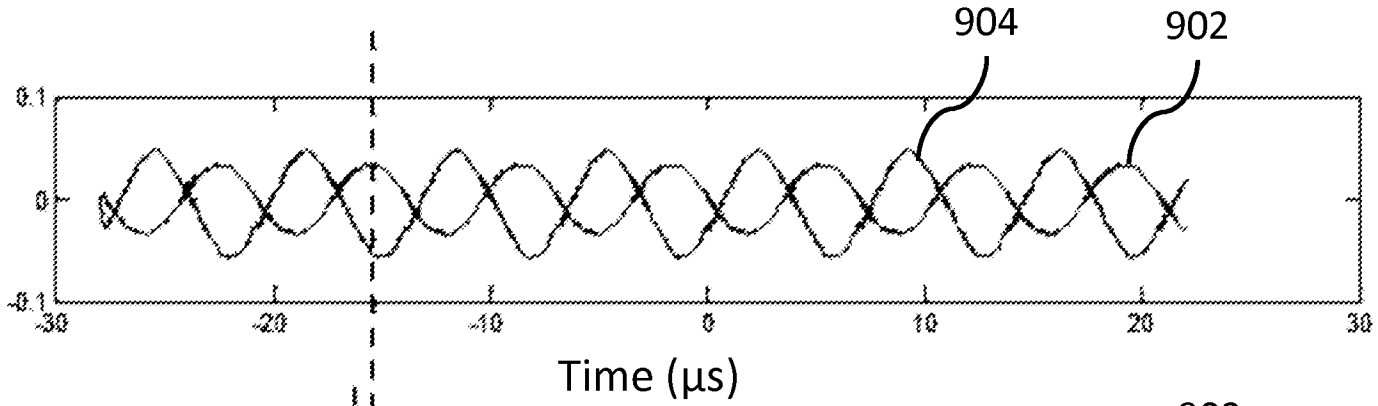


Fig. 9B

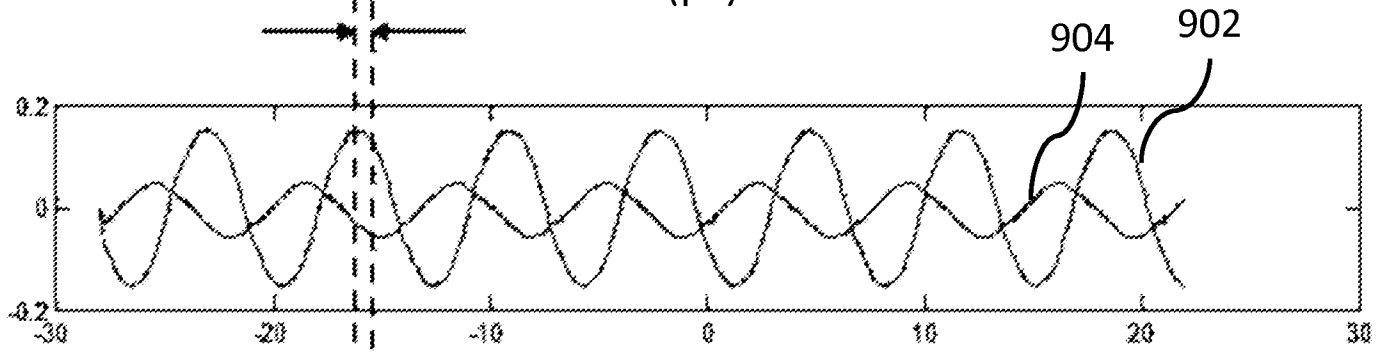


Fig. 9C

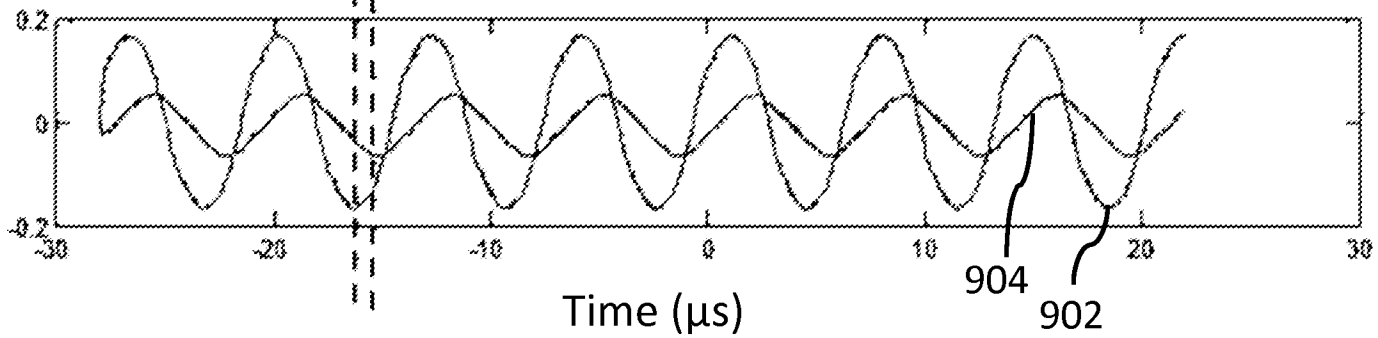
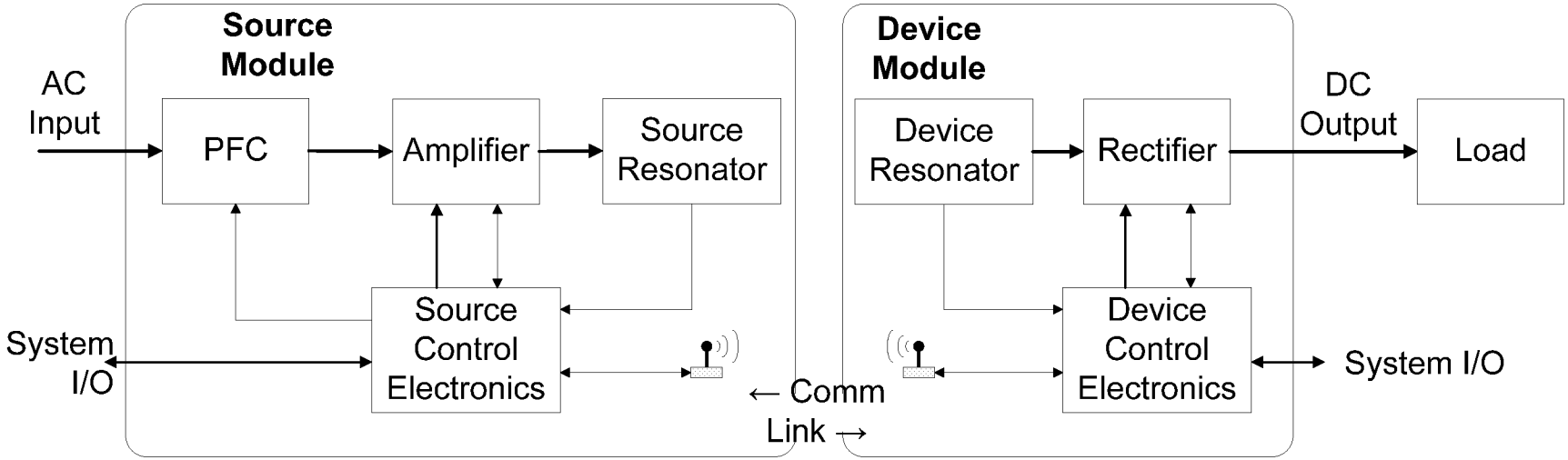


Fig. 10


Source Module
Device Module
AC Input
PFC
Amplifier
Source Resonator
Device Resonator
Rectifier
DC Output
Load
Source Control Electronics
Device Control Electronics
System I/O
System I/O
← Comm Link →

FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. provisional patent application 61/532,785 filed September 9, 2011.

BACKGROUND

Field:

[0002] This disclosure relates to wireless energy transfer and methods for detecting foreign object debris (FOD) on wireless power transmission systems.

Description of the Related Art:

[0003] Energy or power may be transferred wirelessly using a variety of known radiative, or far-field, and non-radiative, or near-field, techniques as detailed, for example, in commonly owned U.S. patent application 12/613,686 published on May 6, 2010 as US 2010/010909445 and entitled "Wireless Energy Transfer Systems," U.S. patent application 12/860,375 published on December 9, 2010 as 2010/0308939 and entitled "Integrated Resonator-Shield Structures," U.S. patent application 13/222,915 published on March 15, 2012 as 2012/0062345 and entitled "Low Resistance Electrical Conductor," U.S. patent application 13/283,811 published on _____ as _____ and entitled "Multi-Resonator Wireless Energy Transfer for Lighting," the contents of which are incorporated by reference.

[0004] Wireless charging systems that rely on an oscillating magnetic field between two coupled resonators can be efficient, non-radiative, and safe. Non-magnetic and/or non-metallic objects that are inserted between the resonators may not substantially interact with the magnetic field used for wireless energy transfer. In some embodiments, users of wireless power transfer systems may wish to detect the presence of these "foreign objects" and may wish to control, turn down, turn off, alarm, and the like, the wireless power transfer system. Metallic objects and/or other objects inserted between the resonators may interact with the magnetic field of the wireless power transfer system in a way that causes the metallic and/or other objects to perturb the wireless energy transfer and/or to heat up substantially. In some embodiments, users of wireless power transfer systems may wish to detect the presence of these "foreign objects" and may wish to control, turn down, turn off, alarm, and the like, the wireless power transfer system.

[0005] Foreign Object Debris (FOD) positioned in the vicinity of wireless power transmission systems can be benign and/or may interact with the fields used for energy transfer in a benign way. Examples of benign FOD may include dirt, sand, leaves, twigs, snow, grease, oil, water, and other substances that may not interact significantly with a low-frequency magnetic field. In embodiments, FOD may include objects that may interact with the fields used for wireless energy transfer in a benign way, but that may be restricted from the region very close to the resonators of the wireless transfer systems because of perceived danger, or out of a preponderance of caution. A common example of this type of FOD is a cat that may wish to sleep between the coils of a wireless EV charging system for example. In embodiments, some FOD may interact with the magnetic field in a way that may perturb the characteristics of the resonators used for energy transfer, may block or reduce the magnetic fields used for energy transfer, or may create a fire and or burning hazard. In some applications special precautions may be necessary to avoid combustible metallic objects becoming hot enough to ignite during high-power charging. Some metallic objects can heat up and have enough heat capacity to cause a burn or discomfort to a person who might pick them up while they are still hot. Examples include tools, coils, metal pieces, soda cans, steel wool, food (chewing gum, burgers, etc.) wrappers, cigarette packs with metal foil, and the like.

[0006] Thus what are needed are methods and designs for detecting or mitigating the effects of FOD in the vicinity of the wireless energy transfer system.

SUMMARY

[0007] In accordance with exemplary and non-limiting embodiments, a foreign object debris detection system may measure perturbations in the magnetic field around the resonators of a wireless energy transfer system using magnetic field sensors and/or gradiometers. The sensors and/or gradiometers may be positioned in the magnetic field of a wireless energy transfer system. The sensors and/or gradiometers may comprise loops of wire and/or printed conductor traces forming loops, figure-8 loops, and/or structures comprising one loop or multiple loops that generate an electrical signal proportional to the amount of magnetic flux crossing its surface. The loop and/or loops may be connected to high-input-impedance readout circuitry. The readout circuitry may measure the voltage and/or the current and/or the relative phase of the voltages and/or currents in the loops. In embodiments the system may include multiple layers of loops to increase the detection probability of FOD. In embodiments, the loops may be designed to

operate without significantly affecting characteristics of the wireless power transfer system such as the perturbed quality factors of the resonators, the efficiency of the energy transfer, the amount of power transferred, the amount of heat generated by the system, and the like.

[0008] In accordance with exemplary and non-limiting embodiments, there is provided a wireless energy transfer system may comprise foreign object debris detection system. The system may include at least one wireless energy transfer source configured to generate an oscillating magnetic field. The foreign object debris may be detected by a field gradiometer positioned in the oscillating magnetic field. The voltages and/or currents of the field gradiometers may be measured using readout circuitry and a feedback loop based on the readings from the gradiometers may be used to control the parameters of the wireless energy source.

BRIEF DESCRIPTION OF FIGURES

[0009] Figure 1 shows a side view of a resonator with a resonator cover providing passive FOD mitigation.

[0010] Figure 2 two loops of wire that may be used as individual field sensors and that may be fashioned into a gradiometer that senses the difference in the magnetic flux capture by the two individual field sensors.

[0011] Figure 3A shows a two-lobe configuration of two small conductor loops arranged to have opposed magnetic dipoles, (such a structure may be referred to as a magnetic quadrupole); 3B shows a 4-lobe configuration of aligned magnetic quadrupoles; 3C shows a 4-lobe configuration of opposed quadrupoles, sometimes referred to as an octupole; and 3D shows a 4-lobe configuration extending in a linear dimension. The "+" and "-" signs indicate the direction of the magnetic dipole of each loop, in a relative reference frame

[0012] Figure 4A shows a FOD detector array comprising loops with a square shape to achieve high area-fill factor; and 4B shows an embodiment with two offset arrays, an arrangement that may be used to eliminate blind spots.

[0013] Figure 5 shows a FOD detector connected to a readout circuit.

[0014] Figure 6 shows an array of FOD detectors connected to readout circuitry.

[0015] Figure 7 shows an array of FOD detectors connected to readout circuitry and a synchronization loop.

[0016] Figure 8 shows an example embodiment of FOD detector loops.

[0017] Figure 9A-9C shows example voltage measurement curves from a figure-8 gradiometer sensor.

[0018] Figure 10 shows a block diagram of an exemplary EV charger system.

DETAILED DESCRIPTION

[0019] Methods for mitigating FOD risks can be categorized as passive mitigation techniques and active mitigation techniques. Passive mitigation techniques may be used to prevent FOD from entering or remaining in the regions of high magnetic field. Passive mitigation techniques may lower the likelihood of FOD interacting hazardously with magnetic fields. Active mitigation techniques may be used detect and react to the presence of FOD.

Passive Mitigation Techniques

[0020] Passive mitigation techniques may be used to keep FOD from entering the regions between resonators or specific regions of high magnetic field, thereby preventing the interaction of the FOD with the magnetic fields.

[0021] By way of additional exemplary embodiments, the design of a resonator cover in a wireless power transfer system may provide a passive FOD mitigation technique. In embodiments the enclosure of a source and/or device and/or repeater resonator may be shaped to prevent FOD from coming close to the areas of the resonators and/or the resonator coils where the magnetic field may be large. A resonator enclosure may be designed to be curved, angled, or shaped to force any FOD on the cover to roll off the cover and away from the resonator and/or high magnetic fields. The resonator enclosure may be shaped or positioned to allow gravity to pull objects away from the resonators. In other embodiments the enclosures and position of the resonators may be designed to use other natural or omnipresent forces to move FOD away. For example, the force of water currents, wind, vibration, and the like may be used to prevent FOD from accumulating or staying in unwanted regions around resonators. In embodiments, the resonators may be arranged to be substantially perpendicular to the ground so that objects may not naturally rest and accumulate on the resonators. In embodiments, the resonator enclosure may include a keep-out zone providing for a minimum distance between FOD and the resonator components. The keep-out zone may be sufficiently large to ensure that the fields at the outside of the keep-out zone are sufficiently small to not cause safety or performance concerns.

[0022] An example resonator cover providing a degree of passive FOD protection is shown in Fig. 1. A magnetic resonator **104** of a wireless power transfer system may be

surrounded with or enclosed by or placed under a shaped cover **102**. The cover **102** may be shaped to force FOD **106** to roll down the cover **102** due to the force of gravity. The shape of the cover **102** may prevent FOD **106** from accumulating on top of the cover **102** and/or in the vicinity of the resonator **104** by forcing any FOD to the sides of the resonator and/or away from the regions surrounding the resonator where the magnitude of the magnetic fields is high enough to cause a hazardous condition due to heating of the FOD. In embodiments, the FOD may be forced far enough away from the high field regions to no longer pose a risk of being heated and/or ignited by the fields.

[0023] In other exemplary and non-limiting embodiments, a passive FOD technique may include sizing the resonators and/or resonator components to reduce the maximum magnetic field density anywhere in the region of wireless power exchange below a desired limit. In embodiments, relatively large resonator coils may be used to mitigate a subset of FOD risks. For a fixed level of power transfer the use of larger resonator coils may be used to reduce the magnetic field strength per unit area required to transfer a certain amount of power wirelessly. For example, the maximum magnetic field strength generated by a source may be reduced below a threshold where heating or other hazards may be known to occur. Passive mitigation techniques may not always be possible or practical or sufficient. For example, reducing a FOD hazard by increasing a resonator size may not be practical owing to the system cost restraints or to the desire to integrate a resonator into a system of a specified volume. However, even in applications where a completely passive technique may not be possible, practical and/or sufficient, passive mitigation techniques may be used to at least partially reduce the FOD risk and may be complementary to active mitigation techniques.

Active Mitigation Techniques

[0024] In accordance with exemplary and non-limiting embodiments, an active mitigation technique for FOD may include a detector system that may detect metallic objects, hot objects, perturbations in resonator parameters, and/or perturbations in magnetic field distributions.

[0025] In accordance with exemplary and non-limiting embodiments, FOD objects, such as metallic objects, may be of sufficient size, extent, and/or material composition to perturb the efficiency or power transfer capabilities of a wireless energy transfer system. In such cases, the presence of said FOD objects may be determined by examining the change in one or more of the

voltage, current, and/or power associated with the source resonator and/or device resonator and/or repeater resonator of a wireless power system. Some FOD objects may perturb the parameters of the resonators used for energy transfer and/or may perturb the characteristics of the energy transfer. A FOD object may change the impedance of a resonator for example. In accordance with exemplary and non-limiting embodiments, these perturbations may be detected by measuring the voltage, current, power, phase, frequency, and the like of the resonators and the wireless energy transfer. Changes or deviations from expected or predicted values may be used to detect the presence of FOD. In an exemplary embodiment, dedicated FOD sensors may not be needed to detect and react to FOD in a wireless power system.

[0026] In accordance with exemplary and non-limiting embodiments, FOD objects may only weakly perturb the wireless energy transfer and may not be substantially detectable by monitoring electrical parameters of the resonators and/or the characteristics of the wireless energy transfer. Such objects can still create a hazard, however. For example, a FOD object that only weakly interacts with the magnetic field may still heat up substantially. An example of a FOD object that may only weakly interact with the magnetic field but that may experience significant heating is a metal-foil-and-paper wrapper such as is often found in chewing gum and cigarette packages and as is often used to wrap food from fast food establishments such as Burger King and Kentucky Fried Chicken. When placed between the resonators of a 3.3-kW wireless energy vehicle charging system, a chewing gum wrapper may not be detectable by examining the electrical parameters associated with the resonators and/or the energy transfer system. However, said wrapper may still absorb enough power to rapidly heat and for the paper to eventually burn.

[0027] In accordance with exemplary and non-limiting embodiments, an active mitigation system for FOD may comprise temperature sensors to detect hot spots, hot areas, and/or hot objects near by the wireless energy transfer system. A system may comprise any number of temperature sensors, infrared detectors, cameras, and the like to detect a heat source, heat gradient and the like around the energy transfer system. In embodiments, hot object sensing may be used alone or in addition to other active and passive mitigation techniques and can be used to further improve the detectability of heated FOD and/or reduce the false-alarm rate of other active FOD systems.

[0028] In accordance with exemplary and non-limiting embodiments, an active mitigation system for FOD objects that only weakly perturb the magnetic field between two resonators may comprise sensors for measuring small changes in the magnetic field in the proximity of the FOD objects. For example, a metal-foil-and-paper chewing gum wrapper may not substantially alter the magnetic flux between two resonators, but it might substantially alter the magnetic flux through a much smaller sensor coil or loop if it covered and/or blocked any portion of the coil or loop area. In embodiments, local disturbances in the magnetic field caused by the presence of FOD may be detected by measuring magnetic field changes, variations, gradients, and the like, in the vicinity of the FOD.

[0029] In accordance with exemplary and non-limiting embodiments, a FOD sensor may be realized using two small wire loops **202, 204** as shown in Fig. 2. Such a sensor may be placed on or near the resonators used for wireless energy transfer. During operation the wireless energy transfer system generates a magnetic field that passes through the two loops. Each individual loop develops a voltage proportional to the amount of magnetic flux threading the inside of each loop **206, 208**. The difference between the voltages developed by the two loops is, to first order, proportional to the gradient of the magnetic field in proximity to the loops. If the two loops are placed in a region of uniform field and the loops are substantially similar, then the difference between the voltages developed by the two loops may be very small. If, for example, a chewing gum wrapper is placed so that it partially covers one of the loops but not the other, then the difference in voltage developed by the two loops will be larger than when the wrapper was not present because the metallic foil of the gum wrapper may deflect or/or absorb some of the magnetic flux that would have normally passed through that loop. In embodiments, the output from the two loops may be subtracted from each other so that the combination of loops produces a small signal when the sensed field is substantially uniform, and a measurably larger signal when there is a gradient in the field between the two loops. When the loops and/or coils are configured to generate a signal in the presence of a field gradient, they may be referred to as being arranged as a gradiometer. Note the signals from the loops may be subtracted using analog circuitry, digital circuitry and/or by connected the loops together in a specific configuration. The sensitivity of the sensor and/or gradiometer may be related to the magnitude and/or phase of the voltage difference between the two loops.

[0030] In accordance with exemplary and non-limiting embodiments, the sensitivity of the sensor and/or gradiometer may be adjusted to preferentially detect objects of a given size, or above a given size. The sensitivity may be adjusted to reduce false detection rates, to lower the noise of the detection system, and/or to operate over a range of frequencies. In embodiments the size and shape of the loops may be adjusted to adjust the sensitivity of the sensor. The loops may be adjusted to comprise more turns and or to comprise additional loops, such as four loops, or eight loops for example. In embodiments, the loops may be positioned to have rotational symmetry or they may be arranged in a linear arrangement or they may be shaped to fill a region of any size and shape.

[0031] In embodiments where the field density may be non-uniform in the locations where gradiometers may be placed and/or where other gradiometer and/or loop designs may be implemented, the presence of metallic objects may result in amplitude and/or phase changes in the waveform corresponding to the difference between the two loop voltages. In embodiments, the loops may have a plurality of turns. In accordance with exemplary and non-limiting embodiments, the loop areas **206, 208** may be sized according to the magnetic field strength of the wireless energy transfer system, the desired sensitivity of the detection method, the complexity of the system and the like. If the metallic FOD is substantially smaller than the loop area, only a weak signal may arise when the FOD is present. This weak signal may risk being overwhelmed by noise or interfering signals. If the loop is sized to be on the order of (e.g. within a factor of 3) of the minimum FOD size to be detected, then the signal may be sufficiently large for detection with low false-alarm rate. In embodiments, a FOD sensor and/or gradiometer may comprise one or more loops of different sizes, shapes and/or arrangements. In embodiments, a FOD sensor may comprise regions with one sensor, more than one sensor or no sensor.

[0032] In accordance with exemplary and non-limiting embodiments, another way to measure a field gradient in the vicinity of a metallic object may be to create a coil (also referred to as a loop) in a fashion that directly outputs a voltage that is proportional to the local gradient in the magnetic field. Such a coil serves the purpose of the two coils depicted in Fig. 2, but requires only one voltage measurement. If, for example, one were to double the area of one of the loops depicted in Fig. 2 and then twist it into a figure-8 shape where each lobe of the figure-8 had approximately equal area, but the current induced in each loop by the local magnetic field traveled in the opposing directions, then the voltage developed across its two terminals would be

proportional to the difference in magnetic flux between the two lobes. Fig. 3A-3D depicts some exemplary configurations of twisted loops that may be capable of directly outputting a voltage that is proportional to the local gradient in the magnetic field.

[0033] The two loops shown in Fig. 2 may be referred to as magnetic dipoles and the loops in Fig. 3A may be referred to as gradiometers and/or magnetic quadrupoles and the loops in Fig. 3B as gradiometers and/or octupoles, respectively. The quadrupole configuration may develop a voltage proportional to the magnetic field gradient in the left-to-right orientation. The 4-lobe configurations can be configured to measure field gradients (Fig. 3B), and gradients of field gradients (Fig. 3C). Fig. 3D is representative of embodiments where multiple lobes may extend along a linear dimension. In embodiments, higher-order multipoles with an even number of lobes can also be configured to measure spatial perturbations to the magnetic field. In embodiments, the lobes depicted in Fig. 3A-3D may use multiple turns of conductor.

[0034] Each of these configurations can accomplish the goal of measuring magnetic field perturbations due to the presence of metallic FOD. The configurations with multiple lobes may have an advantage in covering more area without substantially reducing the likelihood of detecting FOD of similar characteristic size to the lobes.

[0035] The loop configurations depicted in Fig. 2 and Fig. 3A-3D are depicted as circular to illustrate the direction of the induced current in the presence of an oscillating magnetic field. The *plus* and *minus* signs indicate whether the induced current flows mostly counter-clock-wise or clock-wise. Shapes other than circles may be better suited for arrays with high-area fill factor. Examples include squares, rectangles, hexagons, and other shapes that tile with little interstitial space in between them. Fig. 4A shows an example of square-shaped coils where the array is assumed to extend further than shown and to have an equal number of *plus* and *minus* loops. The wires of the coils may be connected so that the induced currents flow in the directions indicated by the *plus* and *minus* signs.

[0036] For the configuration shown in Fig. 4A a symmetrical piece of FOD can be placed in a position between adjacent loops so that the field perturbation may not generate a detectable magnetic field gradient. Such a "blind spot" is depicted in Fig. 4A. In accordance with exemplary and non-limiting embodiments, a second layer of arrayed loops may be placed above a first layer and may be offset laterally as shown in Fig. 4B. The offset may be chosen so that the "blind spots" of the first layer of sensors correspond to locations of maximum detectability for

the second layer. In embodiments, the offset may be any offset than improves the likelihood of detection of the FOD relative to the single array detection probability. In this way, the likelihood may be reduced of having substantial blind spots where a piece of FOD may not be detectable. Similar schemes of one or more offset arrays can achieve roughly the same advantage in reducing blind spots. The orientations of the loops in multiple arrays may also be changed to handle non-uniform magnetic fields.

[0037] In embodiments the individual loops or lobes of the dipoles, quadrupoles, octupoles, and the like may be of multiple sizes or of nonuniform sizes. In embodiments where the gradiometer may cover areas of nonuniform magnetic field the loops may be sized to ensure a minimal voltage at the output of the gradiometer loops when no FOD is present. The loops may be sized such that a larger loop is positioned in an area of weaker magnetic field and the smaller loops are positioned in the areas of higher magnetic field. In embodiments the loops may be sized such that a larger loop is positioned in an area of more uniform magnetic field and a smaller loop is positioned in an area of less uniform magnetic field.

[0038] In accordance with exemplary and non-limiting embodiments, an array of FOD sensors may comprise multiple types of sensors. In embodiments, a FOD sensor may comprise single loop sensors and/or dipole gradiometers and/or quadrupole gradiometers and/or octupole gradiometers and so on. Some areas of the FOD sensor may comprise no gradiometers. A FOD sensor may comprise temperature sensors, organic material sensors, electric field sensors, magnetic field sensors, capacitive sensors, magnetic sensors, motion sensors, weight sensors, pressure sensors, water sensors, vibration sensors, optical sensors, and any combination of sensors.

Active FOD Detection Processing

[0040] The coil configurations described above (Fig. 2 to Fig. 4) may develop an oscillating voltage in the presence of an oscillating magnetic field that is non-uniform because of, for example, the presence of FOD. In accordance with exemplary and non-limiting embodiments, a read-out amplifier connected to a given coil may have a high input impedance. This arrangement may prevent a substantial circulating current from developing in the sensor coil which could, in turn, spoil the Q-factor of the resonators used for wireless energy transfer. . In embodiments, the loops, coils, gradiometers and the like may be connected to amplifiers and/or filters and/or analog-to-digital converters and/or operational amplifiers, and or any

electronic component that may be arranged to have high input impedance. In embodiments, a FOD sensor may comprise a conducting loop and a high input impedance electronic component.

[0041] In accordance with exemplary and non-limiting embodiments, each conductor pair from each coil (loop, sensor, gradiometer) in an array may be connected to a readout amplifier and/or an analog-to-digital converter as shown in Fig. 5. Each loop conductor **502** may be connected to an amplifier **506** and/or an analog-to-digital converter **508** and may produce an output **504** that may be used by other elements of a wireless energy transfer system or as an input to a processing element (not shown) such as a microprocessor to store and analyze the output of the coil, loop, sensor and/or gradiometer.

[0042] In other embodiments, the voltage on each coil in an array may be measured in sequence or may be multiplexed in a way that allows fewer read-out amplifiers or analog-to-digital converters to sample the array as shown in Fig. 6. An array of loops of gradiometers **602, 604, 606** may be connected to a multiplexed amplifier **608** and connected to one or more digital-to-analog converters **610**. The output of the digital-to-analog converter **612** may be used by other elements of the wireless energy transfer system or as an input to a processing element (not shown) such as a microprocessor to store and analyze the output of the gradiometer.

[0043] In embodiments, each conductor pair of a sensor and/or gradiometer loop may be connected to active or passive filter circuitry to provide a high terminating impedance at very high or very low frequencies.

[0044] The voltage on a given coil may be sampled at increments that allow a processor to determine the amplitude and phase of the induced waveform relative to a reference waveform. In embodiments, the voltage on a given coil may be sampled at least twice per period of oscillation (i.e. at or above the Nyquist rate). In embodiments, the voltage on a given coil may be sampled less frequently (i.e. in higher-order Nyquist bands). The voltage waveform may be analog filtered or conditioned before sampling to improve the signal-to-noise ratio or to reduce harmonic content of the signals to be sampled. The voltage waveform may be digitally filtered or conditioned after sampling.

[0045] The time-sampled electrical signal from the FOD detector coils may be processed to determine the amplitude and phase with respect to a reference signal. The reference signal may be derived from the same clock used to excite the resonators used for wireless energy transfer.

[0046] In some embodiments the FOD detection system may include a separate frequency, field magnitude, and/or phase sampling loop **704** and electronics **702** to synchronize the sensor and/or gradiometer readings to the oscillating magnetic fields of the wireless energy transfer system as shown in Fig. 7.

[0047] In embodiments, the reference signal may be from a different oscillator at a different frequency.

[0048] An example of processing a figure-8 quadrupole configuration (Fig. 3A) for FOD detection may be as follows:

1. With no FOD present, collect a time-sampled voltage waveform from one of the figure-8 loops
2. Compute the amplitude and phase of the fundamental frequency component (or of its harmonics)
3. Store the amplitude and phase as a baseline reference
4. With FOD present, collect a voltage waveform from the same figure-8 loop
5. Compute the amplitude and phase of the fundamental (or its harmonics)
6. Compare the amplitude and phase to the reference
7. On a polar plot (or in amplitude-and-phase space), if the distance between the signal and the reference exceeds a predetermined threshold, declare a detection of FOD.

[0049] In embodiments, the processing of the signal may be performed using analog electronic circuits, digital electronics or both. In embodiments, the signals from multiple sensors may be compared and processed. In embodiments, FOD sensors may reside on only one, or all, or some of the resonators in a wireless power transfer system. In embodiments, the signals from FOD sensors on different resonators may be processed to determine the presence of FOD and/or to give control information to the wireless power system. In embodiments, FOD detection may be controllably turned on and off. In embodiments, FOD detection and processing may be used to control the frequency of the wireless power transfer system, the power level transferred by the wireless power system, and/or the time period when wireless power transfer is enabled and/or disabled. In embodiments, the FOD detectors may be part of a reporting system that may report to a system user that FOD is present and/or that may report to higher level systems that FOD is present or is not present. In embodiments, a FOD detection system may comprise a "learning capability" that may be used to identify certain types of FOD and that may

comprise system and/or system feedback to categorize types of FOD as harmless, in danger of heating, not allowed for other reasons, and the like.

[0050] In accordance with exemplary and non-limiting embodiments processing may be embedded into the FOD detection subsystem or data may be sent back to a central processor. The processing may compare collected voltage waveforms to reference waveforms and look for statistically significant changes. Those skilled in the art will understand that the waveforms can be compared in amplitude and phase, I or Q components, sine or cosine components, in the complex plane, and the like.

Exemplary Active FOD Detection Embodiments

[0049] Two specific and non-limiting embodiments of FOD detection systems that were fabricated are described below. Data have been collected from both embodiments that show them working as FOD detectors.

[0050] In the first embodiment a stranded wire was formed into a figure-8 loop forming a quadrupole as shown in Fig. 8 with a longer wire between the two loops (gradiometer 1). The second embodiment was designed as shown as gradiometer 2 in Fig. 8. The figure-8 loops were approximately 5 cm long. Fig. 9A-9C show the voltage waveforms collected from the two sensors placed on top of a wireless energy source between the resonators for a 3.3-kW wireless energy transfer system, when the system was delivering 3.3 kW to a load. Fig. 9A shows the small residual voltage (~30 mV_{rms}) on the two gradiometers pictured Fig. 8. The residual voltage is due to a combination of non-uniform magnetic field, slight variations in lobe area, and electrical interference. Results from gradiometers #1 and #2 are plotted in as curve **904** and curve **902**, respectively. When a metallic chewing gum foil is placed on the right lobe of gradiometer #2, some flux is blocked and a substantial amplitude increase and slight phase shift is observable in Fig. 9B, curve **902**. Conversely, when the foil is moved to the left lobe of gradiometer #2, the amplitude stays the same but the phase changes by 180° as shown in Fig. 9C. These changes in phase and amplitude readings may be used to detect the presence of FOD on the sensors.

[0051] An embodiment of the figure-8 sensors was also fabricated using printed-circuit board (PCB) techniques to realize the sensor coils or loops. This embodiment may have advantages including low cost, higher fill factor (since the loops can be made into any shape and easily tiled using standard PCB processing techniques), higher uniformity, higher reproducibility, small size and the like. A higher-fill factor was obtained using tiled rectangular

loops for a 16-channel array of single figure-8 sensors. The printed loops were highly uniform resulting in smaller (and flatter) baseline readings from the sensors when no FOD was present.

Other Embodiments

[0052] In embodiments the sensors and gradiometer sensors described above can be combined with other types of FOD sensors to improve detection likelihood and lower false alarms (system detects FOD when no FOD is present). For example, an array of temperature sensors can be integrated into the resonator assembly. If a piece of FOD begins to heat up it would disturb the normally expected spatial temperature distribution. That deviation can be used to send an alarm to the system controller. In embodiments, the temperature sensor may be used alone or in combination with a metal object sensor and/or it may be used as a backup or confirming sensor to the metallic object sensor.

[0053] Living beings such as pets can be difficult to detect. In general, they may not interact in a substantial manner with the magnetic field. In addition, living beings may not heat up appreciably when exposed to magnetic fields. Nonetheless, a wireless power system may need to shut down if living beings intrude into magnetic fields of certain field strengths. The field strength limits may be frequency dependent and may be based on regulatory limits, safety limits, standards limits, public perception limits, and the like. In embodiments, a dielectric sensor that measures changes in the fringe capacitance from a conductor such as a long wire can detect the proximity of living beings. In embodiments, this type of sensor may be used during diagnostic testing, prior to wireless energy transfer, and during wireless energy transfer.

Applications to Vehicle Charging

[0053] Detection of FOD may be an important safety precaution in many types of wireless energy transfer systems. For the example of a 3.3-kW car charging system, an example of an embodiment follows.

[0054] A block diagram of an exemplary EV Charger System is shown in Fig. 10. The system may be partitioned into a Source Module and a Device Module. The Source Module may be part of a charging station and the Device module may be mounted onto an electric vehicle. Power is wirelessly transferred from the Source to the Device via the resonators. Closed loop control of the transmitted power may be performed through an in-band and/or out-of-band RF communications link between the Source and Device Modules.

[0055] A FOD detector system (not shown) can be integrated into the system in a variety of places. In embodiments, FOD systems may be integrated into the Source Module, into the source resonator, into the housings or enclosures of the source resonator and the like. In other embodiments, the FOD systems may be integrated on the device side of the system. In other embodiments, FOD systems may be implemented on both the source and device sides of the wireless power transmission system. In embodiments, the FOD detection system may include multiple sensors and a processor with a discrimination algorithm. The processor can be connected to an interface that functions as an interlock in the Source control electronics. Other FOD detector systems may be connected to the charger systems through an additional interface or through an external interface. Local I/O at each module may provide interface for system level management and control functions in a wireless power system utilizing FOD detection.

[0056] The source resonator in a high power (3.3+ kW) vehicle charging system may have its highest magnetic field density near the boundaries of the windings and, optionally, any magnetic material. In this area, an array comprising multiple channels of double-figure 8 coils with rectangular-shaped lobes can protect against inadvertent heating of metallic FOD. The array may be fabricated on a PCB and may have integrated filtering and signal conditioning included on the board. A second PCB of equivalent design may be positioned slightly above the first PCB and translated laterally in the manner described in Fig. 4B. An algorithm like that described above may run in an on-board processor whose output may be transmitted to a system controller. The system controller can compare the output of the metallic FOD detector to the outputs of additional FOD detectors, such as those measuring temperature profiles or dielectric changes. The system can then decide whether to turn down or shut down the system if FOD is detected.

[0057] Some possible operation modes of a FOD detection system are as follows:

- Low-power diagnostic tests can be performed without the vehicle present to check health and status of the charging station (infrequent) and to check for FOD prior to a vehicle driving over the source (more frequent).
- After the vehicle arrives and is positioned over the source module, but prior to high-power charging, the FOD detector may verify that the source is still free of FOD.
- During high-power charging the FOD detector can verify that no additional FOD has moved onto the coil.

[0058] While the invention has been described in connection with certain preferred embodiments, other embodiments will be understood by one of ordinary skill in the art and are intended to fall within the scope of this disclosure, which is to be interpreted in the broadest sense allowable by law. For example, designs, methods, configurations of components, etc. related to transmitting wireless power have been described above along with various specific applications and examples thereof. Those skilled in the art will appreciate where the designs, components, configurations or components described herein can be used in combination, or interchangeably, and that the above description does not limit such interchangeability or combination of components to only that which is described herein.

[0059] Note too, that the techniques described here may be applied to any wireless power system that transmits power using electromagnetic fields. In cases where we have described source and device resonators of highly resonant wireless power systems, one of skill in the art will understand that the same sensors, detectors, algorithms, subsystems and the like could be described for inductive systems using primary and secondary coils.

[0060] All documents referenced herein are hereby incorporated by reference.

What is claimed is:

1. A foreign object debris detection system for a wireless energy transfer system comprising:

at least one magnetic field sensor, and

at least one readout circuit to measuring electrical parameters of the at least one magnetic field sensor,

wherein the at least one magnetic field sensor is positioned within the magnetic field of the wireless energy transfer system.

2. The system of claim 1, wherein the at leat one magnetic field sensor comprises a magnetic field gradiometer.

3. The system of claim 2, wherein the at least one magnetic field gradiometer comprises a figure-8 quadrupole conductor loop.

4. The system of claim 2, wherein the at least one magnetic field gradiometer comprises an octupole conductor loop.

5. The system of claim 2, wherein the readout circuit has an input impedance sufficient to substantially prevent circulating currents in the gradiometer loop.

6. The system of claim 3, wherein the figure-8 quadrupole conductor loop is printed on a circuit board.

7. The system of claim 6, wherein the figure-8 quadrupole conductor loop is rectangular

8. The system of claim 3, wherein the system comprises an array of gradiometer loops positioned in the magnetic field of the wireless energy transfer.

9. The system of claim 8, wherein the system comprises multiple layers of offset and overlapped gradiometer loops.

10. The system of claim 5, wherein the readout circuitry is multiplexed among a plurality of gradiometer loops.

11. The system of claim , further comprising a feedback loop to adjust the parameters of the wireless energy transfer based on readings from the foreign object debris detection system.

12. The system of claim 2, wherein the gradiometer is at least twice the size of a smallest foreign object debris (FOD) to be detected.

13. A wireless energy transfer system with foreign object debris detection, the system comprising:

at least one wireless energy transfer source configured to generate an oscillating magnetic field;

at least one magnetic field gradiometer positioned in the oscillating magnetic field;

a readout circuit to measure electrical parameters of the field gradiometer; and

a feedback loop to control the parameters of the wireless energy transfer source in response to the measured electrical parameters of the field gradiometer.

14. The system of claim 13, further comprising at least one temperature sensor wherein the temperature sensor is positioned to measure the temperature near the wireless energy transfer source.

15. The system of claim 13, wherein a reading from the gradiometer is used to shut down the energy transfer of the at least one wireless energy transfer source.

16. The system of claim 13, wherein the system further comprises an array of field gradiometers connected to high-input-impedance readout circuitry.

17. The system of claim 16, wherein the high impedance readout circuitry monitors the voltage of the gradiometer loops.

18. The system of claim 17, wherein the high impedance readout circuitry monitors the phase of the voltage signal of the gradiometer loops.

19. The system of claim 18, further comprising a field sensing loop for synchronizing the readout circuitry with a frequency of the oscillating magnetic fields of the at least one wireless energy transfer source.

FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

Abstract of the Disclosure

[0061] A wireless energy transfer system includes a foreign object debris detection system. The system includes at least one wireless energy transfer source configured to generate an oscillating magnetic field. The foreign object debris may be detected by at least one field gradiometer positioned in the oscillating magnetic field. The voltage of the at least one field gradiometer may be measured using readout circuitry and a feedback loop based on the readings from the gradiometers may be used to control the parameters of the wireless energy source.

PTO/SB/14 (07-07)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	WTCY-0064-P01
	Application Number	
Title of Invention	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	WTCY-0064-P01
	Application Number	
Title of Invention	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS	

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For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	WTCY-0064-P01
	Application Number	
Title of Invention	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS	

Application Information:

Title of the Invention	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS		
Attorney Docket Number	WTCY-0064-P01	**Small Entity Status Claimed** ☐	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	10	**Suggested Figure for Publication (if any)**	6

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61532785	2011-09-09

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	WTCY-0064-P01
	Application Number	
Title of Invention	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS	

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Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			(•) Yes ( ) No

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Assignee 1 Remove

If the Assignee is an Organization check here. [X]

Organization Name	WiTricity Corporation		
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Signature	/John A. Monocello, III/			Date (YYYY-MM-DD)	2012-09-10
First Name	John A.	Last Name	Monocello, III	Registration Number	51022

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Application Number:	
Filing Date:	
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Filer:	John A. Monocello/Jennifer Sammartin
Attorney Docket Number:	WTCY-0064-P01

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	380	380
Utility Search Fee	1111	1	620	620
Utility Examination Fee	1311	1	250	250
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1250**

Electronic Acknowledgement Receipt

EFS ID:	13702585
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	John A. Monocello/Jennifer Sammartin
Filer Authorized By:	John A. Monocello
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	10-SEP-2012
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Time Stamp:	18:43:25
Application Type:	Utility under 35 USC 111(a)

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Payment Type	Deposit Account
Payment was successfully received in RAM	$1250
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Drawings-only black and white line drawings	WTCY-0064-P01_Figures.pdf	585203 9d348f0e207cb70e86909c2832e045e13cb38de0	no	10
Warnings:					
Information:					
2		WTCY-0064-P01_Specification_final-2.pdf	198790 dbeca0ebf4caf73e15e5476052b426704d22f70e	yes	20

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	16
Claims	17	19
Abstract	20	20

Warnings:					
Information:					
3	Application Data Sheet	WTCY-0064-P01-ADS.pdf	1357676 c4ee9a77004c60e06af085b63965b04604388be7	no	5
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	33130 e79b9be37dfbb922f174c6af7d2cb251ebeaaf5d	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	2174799	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/608,956

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	*			OR	x 60 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1250

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/608,956	09/10/2012	Simon Verghese	WTCY-0064-P01

CONFIRMATION NO. 4270

87084
GTC Law Group LLP & Affiliates
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

FORMALITIES LETTER

OC000000056675118

Date Mailed: 09/25/2012

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- A surcharge (for late submission of the basic filing fee, search fee, examination fee or inventor's oath or declaration) as set forth in 37 CFR 1.16(f) of $ **130** for a non-small entity, must be submitted.

SUMMARY OF FEES DUE:

Total fee(s) required within **TWO MONTHS** from the date of this Notice is $ **130** for a non-small entity
- $ **130** Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/sgorems/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/608,956	09/10/2012	2617	1250	WTCY-0064-P01	19	2

CONFIRMATION NO. 4270

87084
GTC Law Group LLP & Affiliates
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

FILING RECEIPT

OC000000056675117

Date Mailed: 09/25/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Simon Verghese, Arlington, MA;
Morris P. Kesler, Bedford, MA;
Katherine L. Hall, Arlington, MA;
Herbert Toby Lou, Carlisle, MA;

Applicant(s)

Simon Verghese, Arlington, MA;
Morris P. Kesler, Bedford, MA;
Katherine L. Hall, Arlington, MA;
Herbert Toby Lou, Carlisle, MA;

Assignment For Published Patent Application

WITRICITY CORPORATION, Watertown, MA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/532,785 09/09/2011

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 09/20/2012
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/608,956**
Projected Publication Date: To Be Determined - pending completion of Missing Parts
Non-Publication Request: No

Early Publication Request: No
Title

FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

Preliminary Class

455

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage, facilitate, and accelerate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Simon Verghese et al.
Serial No.: 13/608,956
Filed: September 10, 2012
Title: FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

Art Unit: 2617
Examiner: Not Yet Assigned
Conf. No. 4270

MAIL STOP MISSING PARTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTICE TO FILE MISSING PARTS OF NON-PROVISIONAL APPLICATION

Dear Sir:

In response to the Notice to File Missing Parts of Non-Provisional Application under 37 CFR §1.53(b) mailed September 25, 2012, attached hereto is an executed Declaration.

The Commissioner is hereby authorized to charge $280 to Deposit Account No. 50-5087.

No additional fees are believed to be due, however, the Commissioner is hereby authorized to charge any fees that may be due in connection with this application to Deposit Account No. 50-5087, Attorney Docket No. WTCY-0064-P01.

Respectfully submitted,

SIMON VERGHESE ET AL.

Customer No. 87084

Date: December 4, 2012

By: /Jeffrey Ambroziak/
Jeffrey Ambroziak
Reg. No. 47,387

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled **FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS,** having the specification (a) that is filed concurrently herewith, or (b) that was previously filed for this application where a Notice of Missing Parts has been issued and this document is being filed in response thereto, in which case I authorize any practitioner associated with Customer Number 87084 to insert the application number hereon.

I hereby state I have reviewed and understand the contents of the above-identified specification, including claims(s), as amended by any amendment referred to above.

That, as to the invention of the present application which is common to any application(s) (1) to which the present application claims foreign priority benefits under Title 35, United States Code, §119(a)-(d) or (f); (2) to any international PCT application(s) to which the present application claims priority benefits under Title 35, United States Code §365(a), said international application(s) designating at least one country other than the United States of America, or (3) any provisional application(s) to which the present application claims benefit under Title 35, United States Code, §119(e) (1, 2, or 3 above alone or collectively hereinafter referred to as "the earlier application(s)"), I do not know and do not believe that the invention was ever known or used in the United States before my invention thereof; or patented or described in any printed publication in any country any time by others before my invention or by anyone more than one year prior to the earlier application(s); or in public use or on sale in the United States by anyone more than one year prior to the earlier application(s) in the United States.

That, as to the invention of the present application which is not common to any earlier application(s), I do not know and do not believe that the invention was ever known or used in the United States before my invention thereof; or patented or described in any printed publication in any country anytime by others before my invention or by anyone more than one year prior to the present application; or in public use or on sale in the United States by anyone more than one year prior to the present application in the United States.

That, as to the invention of the present application which is common to any earlier application(s), I do not know and do not believe that the invention has been patented or caused to be patented, or was the subject of an inventor's certificate by me or my legal representatives or assigns in any country foreign to the United States on a patent application or inventor's certificate filed more than twelve months, or six months for a design application, prior to the filing date in the United States of the earlier application(s).

That, as to the invention of the present application which is not common to any earlier application(s), I do not know and do not believe that the invention has been patented or cause to

be patented, or was the subject of an inventor's certificate, by me or my legal representative or assigns in any country foreign to the United States on a patent application or inventor's certificate filed more than twelve months, or six months for a design application, prior to the filing date in the United States of this present application.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date and/or priority date of any earlier application and the national or PCT international filing date of the present application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by entering "Yes" or "No", any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION NO.	COUNTRY	FOREIGN FILING DATE (mm/dd/yyyy)	PRIORITY CLAIMED	CERTIFIED COPY ATTACHED?

I hereby appoint the practitioners associated with

Customer Number 87084

To prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith.

Please send all correspondence to Customer Number 87084.

Please direct all telephone calls to John A. Monocello, III, at telephone number (412) 953-0696.

The law firm of **GTC LAW GROUP LLP & AFFILIATES** whose address is P.O. Box 52050, Minneapolis, MN 55402, has been assigned Customer Number 87084 by the United States Patent and Trademark Office.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereof.

FULL NAME OF INVENTOR Simon Verghese	
INVENTOR'S SIGNATURE S Verghese	DATE 11-30-12
RESIDENCE 5 Parker Road, Arlington, MA 02474	
COUNTRY OF CITIZENSHIP US	
MAILING ADDRESS 5 Parker Road, Arlington, MA 02474	

FULL NAME OF INVENTOR Morris P. Kesler	
INVENTOR'S SIGNATURE Morris P Kesler	DATE 11-29-12
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MAILING ADDRESS 98 Hancock Street, Bedford, MA 01730	

FULL NAME OF INVENTOR	
Katherine L. Hall	
INVENTOR'S SIGNATURE	DATE
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MAILING ADDRESS	
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FULL NAME OF INVENTOR	
Herbert Toby Lou	
INVENTOR'S SIGNATURE	DATE
	11/28/2012
RESIDENCE	
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COUNTRY OF CITIZENSHIP	
US	
MAILING ADDRESS	
84 Patch Meadow Lane, Carlisle, MA 01741	

*Before signing this declaration each person must:

1. Review the declaration and verify the correctness of all information therein; and
2. Review the specification and the claims, including any amendments made to the claims.

Electronic Patent Application Fee Transmittal

Application Number:	13608956
Filing Date:	10-Sep-2012
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Filer:	Jeffrey R. Ambroziak/Jennifer Sammartin
Attorney Docket Number:	WTCY-0064-P01

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	150	150
Miscellaneous:				
			Total in USD ($)	**280**

Electronic Acknowledgement Receipt

EFS ID:	14377547
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	Jeffrey R. Ambroziak/Jennifer Sammartin
Filer Authorized By:	Jeffrey R. Ambroziak
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	04-DEC-2012
Filing Date:	10-SEP-2012
Time Stamp:	13:44:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$280
RAM confirmation Number	367
Deposit Account	505087
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	WTCY-0064-P01_RMP.pdf	67198 782d70863c35edcb99e3569389eb24501542e200	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	WTCY-0064-P01_executed-Declaration.pdf	199104 1c6daa3423fbb0444791b0c5ccec7249277cbf82	no	4
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32766 87a171975ad4c9eaf9d8c316de936d44752afff9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	299068		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Modified PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-645576		Mar 20, 1900	Tesla, N.	
	2.	US-649621		May 15, 1900	Tesla, N.	
	3.	US-787412		Apr 18, 1905	Tesla, N.	
	4.	US-1119732		Dec 1, 1914	Tesla, N.	
	5.	US-2133494		Oct 18, 1938	Waters, H. F.	
	6.	US-3517350		Jun 23, 1970	Beaver, William D.	
	7.	US-3535543		Oct 20, 1970	Dailey, C. C.	
	8.	US-3780425		Dec 25, 1973	Alan, William	
	9.	US-3871176		Mar 18, 1975	Schukei, Glen Elwin	
	10.	US-4088999		May 9, 1978	Fletcher, James C., et al.	
	11.	US-4095998		Jun 20, 1978	Hanson, Charles M.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13/608,956
	Filing Date	Sep 10, 2012
	First Named Inventor	Simon Verghese
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	224.	US-20080273242A1		Nov 6, 2008	Woodgate, Graham J., et al.	
	225.	US-20080278264A1		Nov 13, 2008	Karalis, Aristeidis et al.	
	226.	US-20080300657A1		Dec 4, 2008	Stultz, Mark Raymond	
	227.	US-20080300660A1		Dec 4, 2008	John, Michael S.	
	228.	US-20090010028A1		Jan 8, 2009	Baarman, David W., et al.	
	229.	US-20090015075A1		Jan 15, 2009	Cook, Nigel P., et al.	
	230.	US-20090033564A1		Feb 5, 2009	Cook, Nigel P., et al.	
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	235.	US-20090067198A1		Mar 12, 2009	Graham, D. J., et al.	
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	238.	US-20090072629A1		Mar 19, 2009	Cook, Nigel P.	
	239.	US-20090072782A1		Mar 19, 2009	Randall, Mitch	
	240.	US-20090079268A1		Mar 26, 2009	Cook, N. P., et al.	
	241.	US-20090085408A1		Apr 2, 2009	Bruhn, Alfred	
	242.	US-20090085706A1		Apr 2, 2009	Baarman, David W., et al.	
	243.	US-20090096413A1		Apr 16, 2009	Partovi, Afshin et al.	
	244.	US-20090102292A1		Apr 23, 2009	Cook, Nigel P., et al.	
	245.	US-20090108679A1		Apr 30, 2009	Porwal, Gunjan	
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	248.	US-20090134712A1		May 28, 2009	Cook, Nigel P., et al.	
	249.	US-20090146892A1		Jun 11, 2009	Shimizu, Kanjiro et al.	
	250.	US-20090153273A1		Jun 18, 2009	Chen, Chih-jung et al.	
	251.	US-20090160261A1		Jun 25, 2009	Elo, HarriHeikki T.	
	252.	US-20090167449A1		Jul 2, 2009	Cook, Nigel P., et al.	
	253.	US-20090174263A1		Jul 9, 2009	Baarman, David W., et al.	
	254.	US-20090179502A1		Jul 16, 2009	Cook, Nigel P., et al.	
	255.	US-20090189458A1		Jul 30, 2009	Kawasaki, Koji	
	256.	US-20090195332A1		Aug 6, 2009	Joannopoulos, John D., et al.	
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	263.	US-20090230777A1		Sep 17, 2009	Baarman, David W., et al.	
	264.	US-20090237194A1		Sep 24, 2009	Waffenschmidt, Eberhard et al.	
	265.	US-20090243394A1		Oct 1, 2009	Levine, Richard C.	
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	267.	US-20090251008A1		Oct 8, 2009	Sugaya, Shigeru	
	268.	US-20090261778A1		Oct 22, 2009	Kook, Yoon-Sang	
	269.	US-20090267558A1		Oct 29, 2009	Jung, Chun-Kil	
	270.	US-20090267709A1		Oct 29, 2009	Joannopoulos, John D., et al.	
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	274.	US-20090273242A1		Nov 5, 2009	Cook, Nigel P.	
	275.	US-20090281678A1		Nov 12, 2009	Wakamatsu, Masataka	
	276.	US-20090284082A1		Nov 19, 2009	Mohammadian, Alireza H.	
	277.	US-20090284083A1		Nov 19, 2009	Karalis, Aristeidis et al.	
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	279.	US-20090284220A1		Nov 19, 2009	Toncich, Stanley S., et al.	
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	282.	US-20090284369A1		Nov 19, 2009	Toncich, Stanley S., et al.	
	283.	US-20090286470A1		Nov 19, 2009	Mohammadian, Alireza H., et al.	
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	288.	US-20100017249A1		Jan 21, 2010	Fincham, Carson et al.	
	289.	US-20100033021A1		Feb 11, 2010	Bennett, James D.	
	290.	US-20100034238A1		Feb 11, 2010	Bennett, James D.	
	291.	US-20100036773A1		Feb 11, 2010	Bennett, James D.	
	292.	US-20100038970A1		Feb 18, 2010	Cook, Nigel P., et al.	
	293.	US-20100045114A1		Feb 25, 2010	Sample, Alanson et al.	
	294.	US-20100052431A1		Mar 4, 2010	Mita, Hiroyuki	
	295.	US-20100052811A1		Mar 4, 2010	Smith, Joshua et al.	
	296.	US-20100060077A1		Mar 11, 2010	Paulus, Peter et al.	
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	301.	US-20100096934A1		Apr 22, 2010	Joannopoulos, John D., et al.	
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	307.	US-20100109604A1		May 6, 2010	Boys, John T., et al.	
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	313.	US-20100123353A1		May 20, 2010	Joannopoulos, John D., et al.	
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	317.	US-20100123530A1		May 20, 2010	Park, Eun-seok et al.	
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	320.	US-20100127575A1		May 27, 2010	Joannopoulos, John D., et al.	
	321.	US-20100127660A1		May 27, 2010	Nigel, Cook P., et al.	
	322.	US-20100133918A1		Jun 3, 2010	Joannopoulos, John D., et al.	
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	326.	US-20100148589A1		Jun 17, 2010	Hamam, Rafif E., et al.	
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	328.	US-20100151808A1		Jun 17, 2010	Stanley, Toncich S., et al.	
	329.	US-20100156346A1		Jun 24, 2010	Takada, Kazuyoshi et al.	
	330.	US-20100156355A1		Jun 24, 2010	Bauerle, Paul A., et al.	
	331.	US-20100156570A1		Jun 24, 2010	Hong, Young-tack et al.	
	332.	US-20100164295A1		Jul 1, 2010	Ichikawa, Katsuei et al.	
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	341.	US-20100181961A1		Jul 22, 2010	Novak, William V., et al.	
	342.	US-20100184371A1		Jul 22, 2010	Nigel, Cook P., et al.	
	343.	US-20100187911A1		Jul 29, 2010	Joannopoulos, John D., et al.	
	344.	US-20100187913A1		Jul 29, 2010	Smith, Joshua R., et al.	
	345.	US-20100190435A1		Jul 29, 2010	Nigel, Cook P., et al.	
	346.	US-20100190436A1		Jul 29, 2010	Nigel, Cook P., et al.	
	347.	US-20100194206A1		Aug 5, 2010	Burdo, Rinat et al.	
	348.	US-20100194207A1		Aug 5, 2010	Graham, David S.	
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	357.	US-20100201310A1		Aug 12, 2010	Vorenkamp, Pieter et al.	
	358.	US-20100201313A1		Aug 12, 2010	Vorenkamp, Pieter et al.	
	359.	US-20100201316A1		Aug 12, 2010	Takada, Kazuyoshi et al.	
	360.	US-20100201513A1		Aug 12, 2010	Vorenkamp, Pieter et al.	
	361.	US-20100207458A1		Aug 19, 2010	Joannopoulos, John D., et al.	
	362.	US-20100210233A1		Aug 19, 2010	Nigel, Cook P., et al.	
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	367.	US-20100219695A1		Sep 2, 2010	Komiyama, Shinji et al.	
	368.	US-20100219696A1		Sep 2, 2010	Kojima, Hideki	
	369.	US-20100222010A1		Sep 2, 2010	Ozaki, Ernest T., et al.	
	370.	US-20100225175A1		Sep 9, 2010	Karalis, Aristeidis et al.	
	371.	US-20100225270A1		Sep 9, 2010	Jacobs, Paul E., et al.	
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	374.	US-20100231053A1		Sep 16, 2010	Karalis, Aristeidis et al.	
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	378.	US-20100237706A1		Sep 23, 2010	Karalis, Aristeidis et al.	
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	381.	US-20100237709A1		Sep 23, 2010	Hall, L. K., et al.	
	382.	US-20100244576A1		Sep 30, 2010	Hillan, John et al.	
	383.	US-20100244577A1		Sep 30, 2010	Shimokawa, Satoshi	
	384.	US-20100244578A1		Sep 30, 2010	Yoshikawa, Hiroyasu	
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	391.	US-20100248622A1		Sep 30, 2010	Lyell Kirby, Miles A. et al.	
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	395.	US-20100259108A1		Oct 14, 2010	Giler, E R., et al.	
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	419.	US-20110043047A1		Feb 24, 2011	Karalis, Aristeidis et al.	
	420.	US-20110043048A1		Feb 24, 2011	Karalis, Aristeidis et al.	
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	424.	US-20110074218A1		Mar 31, 2011	Karalis, Aristedis et al.	
	425.	US-20110074346A1		Mar 31, 2011	Hall, Katherine L., et al.	
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	430.	US-20110121920A1		May 26, 2011	Kurs, B. A., et al.	
	431.	US-20110140544A1		Jun 16, 2011	Karalis, A. et al.	
	432.	US-20110148219A1		Jun 23, 2011	Karalis, A. et al.	
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First Named Inventor/Applicant Name:	Simon Verghese
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37	Foreign Reference	WO2007084716A2.pdf	1442529 feea9b6e8cbd77f2b434fe9021d1d09c795ff63a	no	32

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Information:					
			Total Files Size (in bytes):	109123770	

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New Applications Under 35 U.S.C. 111

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Simon Verghese et al.	Examiner:	Not Yet Assigned
Serial No.:	13/608,956	Group Art Unit:	2617
Filed:	September 10, 2012	Docket:	WTCY-0064-P01
Title:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS		

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Pursuant to the requirements of 37 C.F.R. § 1.97, Applicants hereby submit this Information Disclosure Statement which includes completed Form(s) PTO/SB/08a.

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the referenced materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Information Disclosure Statement be entered and the documents listed on the attached Form(s) PTO/SB/08a be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the PTO/SB/08a form(s), initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Further, Applicants respectfully direct the Examiner's attention to the below-listed related applications. These items, which refer to applications that, at this time and according to each application's current prosecution history, may be related to the prosecution of the present case. Applicants' reference to the co-pending applications is not an admission of the materiality of any application or the prosecution history thereof, nor is it an admission that any of the below co-pending applications constitute prior art.

Application Ser. No.	Filing Date:	Attorney Docket No.
13621503	2012-09-17	WTCY-0005-P01
12639718	2009-12-16	WTCY-0026-P06
13555807	2012-07-23	WTCY-0034-P02
13589992	2012-08-20	WTCY-0034-P03
PCT/US12/47844	2012-07-23	WTCY-0034-PWO
13530280	2012-06-22	WTCY-0038-P03
PCT/US12/40184	2012-05-31	WTCY-0046-PWO
13536435	2012-06-28	WTCY-0057-P01
13603002	2012-09-04	WTCY-0057-P02
13544688	2012-07-09	WTCY-0058-P01
13567893	2012-08-06	WTCY-0061-P01
PCT/US12/49777	2012-08-06	WTCY-0061-PWO
13608956	2012-09-10	WTCY-0064-P01
PCT/US12/54490	2012-09-10	WTCY-0064-PWO
13612494	2012-09-12	WTCY-0065-P01
13654980	2012-10-18	WTCY-0070-P01
PCT/US12/60793	2012-10-18	WTCY-0070-PWO
13688756	2012-11-05	WTCY-0071-P01
PCT/US12/63530	2012-11-05	WTCY-0071-PWO
13534966	2012-06-27	WTCY-0076-P01
13562528	2012-07-31	WTCY-0077-P01
13562553	2012-07-31	WTCY-0078-P01

Pursuant to 37 C.F.R. §1.97(b), it is believed that no fee is required with the Information Disclosure Statement. However, if an Office Action on the merits has been mailed, Applicants hereby authorize the Commissioner to charge any additional fees to Deposit Account 50-3912 in order to have this Information Disclosure Statement considered.

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this communication.

Respectfully submitted,

SIMON VERGHESE ET AL.

By their Representatives,

Customer No. 87084

Date December 5, 2012

By/John A. Monocello, III/
John A. Monocello, III
Reg. No. 51,022

Electronic Acknowledgement Receipt

EFS ID:	14349099
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	John A. Monocello/Kelly Smith
Filer Authorized By:	John A. Monocello
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	05-DEC-2012
Filing Date:	10-SEP-2012
Time Stamp:	13:01:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO2011112795A1.pdf	8840708 c9f7cf1e800e4a3ab5889c60b526f9f78d95c2a9	no	176

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59	Non Patent Literature	IntlAppPCTUS2011027868-ISR_WO.pdf	8798492 885d38792211ca48dc862c2a72cf0589052d391c	no	9
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Information:					
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Electronic Acknowledgement Receipt

EFS ID:	14349448
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	John A. Monocello/Kelly Smith
Filer Authorized By:	John A. Monocello
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	05-DEC-2012
Filing Date:	10-SEP-2012
Time Stamp:	13:15:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Vilkomerson_ImplantableDopplerSystem.pdf	729105 5c67a79a1355267a05d68e258097e54fa1c64d40	no	5

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2	Non Patent Literature	Yariv_Coupled_resonator_optical.pdf	359152 04f4207a7e7a441b1616b683de7d066dbb624784	no	3
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2:03 pm, Feb 03, 2012

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801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 30 JAN 2012
Applicant's or agent's file reference 17157 PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2011/054544	International filing date *(day/month/year)* 03 October 2011
Applicant WITRICITY CORPORATION	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 17157 PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2011/054544	International filing date *(day/month/year)* 03 October 2011	(Earliest) Priority Date *(day/month/year)* 06 October 2010
Applicant WITRICITY CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the drawings to be published with the abstract is Figure No. 1

   ☒ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☐ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/054544

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H02J 7/02 (2011.01)
USPC - 320/109
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - B60L 11/18; B60Q 1/52; G01R 31/36; H02J 7/00, 7/02; H04B 5/00; H04M 10/44 (2012.01)
USPC - 180/65.29; 307/104; 320/108, 109, 149, 152

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase, Google Patents, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/0167294 A1 (ODAOHHARA) 14 November 2002 (14.11.2002) entire document	1-56
Y	US 2010/0235006 A1 (BROWN) 16 September 2010 (16.09.2010) entire document	1-56
Y	US 2010/0156355 A1 (BAUERLE et al) 24 June 2010 (24.06.2010) entire document	3, 7, 26-30, 51, 54
Y	US 6,012,659 A (NAKAZAWA et al) 11 January 2000 (11.01.2000) entire document	5-6
Y	US 2010/0109445 A1 (KURS et al) 06 May 2010 (06.05.2010) entire document	10-12, 17, 28-30, 34, 39
Y	US 2007/0024246 A1 (FLAUGHER) 01 February 2007 (01.02.2007) entire document	18
Y	US 2006/0214626 A1 (NILSON et al) 28 September 2006 (28.09.2006) entire document	45

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 January 2012	30 JAN 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: STUART MEYER
FENWICK & WEST LLP
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	30 JAN 2012
Applicant's or agent's file reference 17157 PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2011/054544	03 October 2011	06 October 2010

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H02J 7/02 (2012.01)
USPC - 320/109

Applicant WITRICITY CORPORATION

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	12 January 2012	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/054544

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed

   ☐ together with the international application in electronic form

   ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2011/054544

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-56	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-56	NO
Industrial applicability (IA)	Claims	1-56	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-2, 4, 8-9, 13-16, 19-25, 31-33, 35-38, 40-44, 46-50, 52-53, and 55-56 lack an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown.

Regarding claims 1 and 49, Odaohhara disclose a safety system (par. 12-13, power supply system) and method (par. 17, method) for a charger to provide protection (par. 12, maintain safety when a battery is connected to a charger) with respect to an object that may become hot during operation of the charger (par. 12, battery maybe charged to a voltage above predetermined voltage, which causes the battery to become hot), the safety system (par. 12, system to maintain safety) comprising: a detection subsystem (par. 13, detecting means; par. 43, current detection circuit 64 and voltage detection circuit 63; par. 56, abnormal current detection table 73; fig.5) for detecting an object (par. 18, recognize the battery is connected to charger); and a notification subsystem (par. 13, notification means; par. 52, notification unit 76) operatively coupled to the detection subsystem (73, detection table) and configured to provide an indication of the object (par. 13-14, notifying system of malfunction occurrence of the battery), but is silent on the particulars of the detecting the presence of an object in substantial proximity to the charger.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose detecting an object in proximity to a charger (par. 30-32, detect the presence of the vehicle is now approaching the apparatus, or charger).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).

Regarding claims 2 and 50, modified Odaohhara disclose claims 1 and 50, respectively, Odaohhara further disclose comprising a management subsystem (fig. 2, CPU 61 within intelligent battery system; par. 43-44, CPU 61 is adapted to detect abnormal charging) operatively coupled to the detection subsystem (fig. 2, CPU 61 connected to detection circuit 63, 64; par. 43-44) and configured to mitigate an effect of the object (par. 51-52, based on the CPU 61 functionality determine whether to turn off or continue charging of battery).

Regarding claim 4, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose wherein the notification subsystem includes an annunciator (par. 62, notify the user of malfunction with a beep sound).

Regarding claims 8 and 55, modified Odaohhara claims 2 and 50, respectively, but Odaohhara is silent on the particulars of wherein the management subsystem is configured to move the object.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose moving an object (par. 111, base may be movable within the plane of the ground; par. 46, charging apparatus 110a moves in one, two or all three axes and rotate as necessary). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Regarding claim 9, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose the management subsystem (61, CPU) is configured to alter operation of the charger (par. 51-52, based on the CPU 61 it is determined whether to continue or abort operation of charger), but Odaohhara is silent on the particulars of responsive to detection of the object.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose altering an operation of a charger responsive to detection of an object (par. 35, various triggers associated with the vehicle, or object, can alter the operation of charging the vehicle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 13, modified Odaohhara disclose a safety system as in claim 1, but Odaohhara is silent on wherein the detection subsystem includes a wall-mounted sensor.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose a wall-mounted sensor (fig. 1, item 130, optical visual guide; par. 49, sensor may be embedded in guide 130). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 14, modified Odaohhara disclose a safety system as in claim 1, but Odaohhara is silent on the particulars of wherein the detection subsystem includes a light sensor.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose a light sensor (par. 59, sensor may use optics, laser or low-power light signal). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 15, modified Odaohhara disclose a safety system as in claim 1, but Odaohhara is silent on wherein the detection subsystem includes a camera.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose using a camera for detecting (par. 113, sensor may include a camera, CCD, etc.). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 16, modified Odaohhara disclose a safety system as in claim 1, but Odaohhara is silent on the particulars of wherein the detection subsystem includes a sensor mounted on a vehicle.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose a sensor mounted to a vehicle (par. 85, on-board sensor). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 19, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose configured to use the detection system for baseline calibration before the charger commences charging (par. 12-13, based on the calculated battery capacity determine whether to charge or not; par. 17-18, based on calculated value or reference value of charging current determine whether to charge).

Regarding claims 20 and 52, modified Odaohhara disclose claims 1 and 49, respectively, Odaohhara further disclose wherein the notification subsystem includes an annunciator/local indicator configured to provide a warning signal in an area proximate to the object (par. 62, provides notification warning signal, such as a beep sound to the user, which implicitly implies that the user in within some area).

Regarding claim 21, modified Odaohhara disclose a safety system as in claim 20, Odaohhara further disclose wherein the warning signal is a visual indication (par. 62, warning signal can be a flashing LED).

Regarding claim 22, modified Odaohhara disclose a safety system as in claim 20, Odaohhara further disclose wherein the warning signal is an aural indication (par. 62, warning signal can be a beep sound).

Regarding claim 23, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose wherein the notification subsystem is configured to provide a remote notification of the object (par. 62, CPU 11 receives the alert to notify the user of the malfunction by displaying on the LCD 18; fig. 1, depicts 10 computer system remote from 52 intelligent battery).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Regarding claims 24 and 53, modified Odaohhara disclose claims 23 and 49, respectively, Odaohhara further disclose the remote notification (par. 62, displaying a malfunction occurrence on the LCD 18, which is remote of from the charger), but is silent on the particulars of an electronically delivered message.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose an electronic message (par. 40, indication can be in expressed in words, letters, etc. to provide indication to operator). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 25, modified Odaohhara disclose a safety system as in claim 1, but Odaohhara is wherein the notification subsystem is enabled upon movement of a vehicle away from the object.
However, the determining of whether is a vehicle is away from or near to an object is known in the art as evidenced by Brown. Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose determining that vehicle is moving away (par. 54, driving away from the apparatus). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 31, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose wherein the management subsystem (CPU 61; par. 44) is configured to turn off the charger responsive to detection of the object (par. 44, turning off charger based on the detecting abnormal charging of battery).

Regarding claim 32, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose wherein the management subsystem (CPU 61) is configured to reduce a charging level of the charger responsive to detection of the object (par. 44, based on detecting abnormal charging of battery turn off charger).

Regarding claims 33 and 56, modified Odaohhara disclose claims 2 and 50, respectively, Odaohhara further disclose wherein the management subsystem (CPU 61) is configured to change an operational parameter of the charger responsive to detection of the object (par. 56-57, CPU in intelligent battery uses formulas to determine the operating parameters for the charger; par. 59).

Regarding claim 35, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose wherein the detection subsystem (par. 13, detecting means; par. 43, current detection circuit 64 and voltage detection circuit 63; par. 56, abnormal current detection table 73; fig.5) is integrated into an electronic system (fig. 1, 10, computer system; par. 29-30, electronic system can be a computer, such as a PC), but is silent on the particulars of a vehicle's electronic systems.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a vehicle electronic system (par. 10, vehicle electrical storage device, battery). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 36, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose wherein the notification subsystem (par. 13, notification means; par. 52, notification unit 76) is integrated into an electronic system (fig. 1, 10, computer system; par. 29-30, electronic system can be a computer, such as a PC), but is silent on the particulars of a vehicle's electronic systems.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a vehicle electronic system (par. 10, vehicle electrical storage device, battery). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 37, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose wherein the management subsystem (CPU 61)) is integrated into an electronic system (fig. 1, 10, computer system; par. 29-30, electronic system can be a computer, such as a PC), but is silent on the particulars of a vehicle's electronic systems.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a vehicle electronic system (par. 10, vehicle electrical storage device, battery). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Regarding claim 38, modified Odaohhara disclose a safety system as in claim 1, wherein the detection subsystem, but Odaohhara is silent on a magnetometer.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose using a magnet for proper orientation (par. 59; par. 119). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Regarding claim 40, modified Odaohhara disclose a safety system as in claim 1,Odaohhara further disclose wherein the detection subsystem (par. 13, detecting means; par. 43, current detection circuit 64 and voltage detection circuit 63; par. 56, abnormal current detection table 73; fig.5) is coupled with a charging subsystem of the charger (par. 12-13, charger for charging battery, implicitly has a charging subsystem), the detection subsystem taking as input operational parameters of the charging subsystem (par. 56-57, CPU in intelligent battery uses formulas to determine the operating parameters for the charger; par. 59), but Odaohhara is silent on determining presence of the object based on the operational parameters of the charging subsystem.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose determining presence of object based on operation parameters of charging system (par. 36, determine operating parameters of vehicle).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).

Regarding claim 41, modified Odaohhara disclose a safety system as in claim 2, but Odaohhara is silent on the particulars of wherein the management subsystem includes a surface configured to facilitate movement of the object.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a surface configured to facilitate movement of an object (par. 77, surface, which is of different orientations, facilitates coupling to vehicle; par. 105-107, surface of ground facilitates movement of vehicle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).

Regarding claim 42, modified Odaohhara disclose a safety system as in claim 2, but Odaohhara is silent on wherein the management subsystem includes a surface that moves so as to facilitate movement of the object.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a surface that moves to facilitate movement of an object (par. 60, tracks, ball bearing, jackscrews, etc. provide a method of moving the apparatus, or object). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).

Regarding claim 43, modified Odaohhara disclose a safety system as in claim 2, but Odaohhara is silent on wherein the management subsystem includes a mechanism to sweep the object so as to cause it to move.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a surface that moves to facilitate movement of an object (par. 46, moves in different directions; par. 60, tracks, ball bearing, jackscrews, etc. provide a method of moving the apparatus, or object). Modified Odaohhara is silent on the particulars of sweeping mechanism.
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).
Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a sweeping mechanism for moving an object, since this is a well known practice in the art and the particulars are a matter of mere design choice.

Regarding claim 44, modified Odaohhara disclose a safety system as in claim 2, but Odaohhara is silent on wherein the management subsystem includes a mechanism to facilitate movement of the object using magnetism.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose using a magnet for proper orientation (par. 59; par. 119). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract -- Brown).

Regarding claim 46, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose wherein the detection subsystem and the notification subsystem are integrated (fig. 6, depicts the abnormal current detection table 73 integrated with malfunction notification unit 76; par. 51-52, fig. 6 is a block diagram of the intelligent battery which includes current detection table and malfunction notification unit).

Regarding claim 47, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose wherein the detection subsystem and the management subsystem are integrated (fig. 2, depicts CPU 61 and detection circuits 63, 64 within intelligent battery).

Regarding claim 48, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose wherein the notification system (fig. 6, malfunction notification unit 76 is within intelligent battery 52) and the management subsystem are integrated (fig. 2, CPU 61, is within intelligent battery 52).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claims 3, 7, 26-27, 51, and 54 lack an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown in further view of Bauerle et al., hereinafter referred to as Bauerle.

Regarding claims 3 and 51, modified Odaohhara disclose claims 1 and 49, respectively, but is Odaohhara is silent on wherein the detection subsystem includes a heat sensor.
However, Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose a heat sensor (par. 14, temperature sensor may sense the temperature of component that exhibits the most heat). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.

Regarding claims 7 and 54, modified Odaohhara disclose claims 2 and 50, respectively, but is silent on the particulars of wherein the management subsystem is configured to cool an area associated with the object.
However, determining whether to cool an area associated with an object is a well known practice in the art as evidenced by Bauerle. Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose cooling an area (par. 13, cooling unit 40 to reduce temperature of battery charger; par. 33, cooling unit 40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.

Regarding claim 26, modified Odaohhara disclose a safety system as in claim 1, wherein the notification subsystem, but Odaohhara is silent on comprises a plurality of sensors, the notification subsystem being configured to detect presence of the object responsive to differential temperature indications from a subset of the plurality of sensors.
However, Brown in discussing a method and apparatus for automatic charging of an electrically powered vehicle (title) disclose a plurality of sensors (par. 118, different types of sensors); detect presence of object from subset of plurailty of sensors (par. 85, detect the vehicle is within distance of apparatus from sensor). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).
Modified Odaohhara is silent on the particulars of a differential temperature indication. Furthermore, Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose a differential temperature indication (par. 17, temperature sensors are collected to determine the average or collective temperature of entire battery unit, differential temperature). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.

Regarding claim 27, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose the management system (CPU 61), but Odaohhara is silent on a coolant dispenser configured to supply a coolant to an area associated with the object responsive to detection of the object.
However, Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose a coolant dispenser configured to supply a coolant to an area in response to a detection of an object (par. 13, cooling unit to reduce temperature of battery; par. 33, cooling unit reduces temperature of battery unit based on detected battery sensor temperatures). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claims 5-6 lack an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown in further view of Nakazawa et al., hereinafter referred to as Nakazawa.

Regarding claim 5, modified Odaohhara disclose a safety system as in claim 1, wherein the detection subsystem, but Odaohhara is silent on the particulars of comprising heat sensitive paint.
However, the use of heat sensitive paint is well known in the art as evidenced by Nakazawa. Nakazawa in discussing a method for discriminating between used and unused gas generators for air bags during car scrapping process (title) disclose using heat sensitive paint (col. 5, lns. 32, heat sensitive paint; col. 5, lns. 66-67, check heat sensitive paints). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Nakazawa with the invention of Odaohhara for the purpose of allowing the vehicle to be readily distinguishable by worker (col. 3, lns. 53-57, Nakazawa).

Regarding claim 6, modified Odaohhara disclose a safety system as in claim 1, wherein the notification subsystem, but Odaohhara is silent on the particulars of comprising heat sensitive paint.
However, the use of heat sensitive paint is well known in the art as evidenced by Nakazawa. Nakazawa in discussing a method for discriminating between used and unused gas generators for air bags during car scrapping process (title) disclose using heat sensitive paint (col. 5, lns. 32, heat sensitive paint; col. 5, lns. 66-67, check heat sensitive paints). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Nakazawa with the invention of Odaohhara for the purpose of allowing the vehicle to be readily distinguishable by worker (col. 3, lns. 53-57, Nakazawa).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claims 10-12, 17, 34, and 39 lacks an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown in further view of Kurs et al., hereinafter referred to as Kurs.

Regarding claim 10, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose the charger (par. 12, charger), and the detection subsystem (fig. 2, items 63, 64, detection circuit) , but Odaohhara is silent on charger containing a source resonator and detection subsystem is integrated with the source resonator.
However, the integrating of a source resonator within various devices is well known in the art as evidenced by Kurs. Kurs in discussing wireless energy transfer (title) disclose a source resonator (par. 8, source resonators; par. 13, source resonator; par. 385, source resonator). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 11, modified Odaohhara disclose a safety system as in claim 1, Odaohhara further disclose the charger (par. 12, charger), and the notification subsystem (par. 13, notification means; par. 52, notification unit 76), but Odaohhara is silent on the charger includes a source resonator, wherein the notification subsystem is integrated with the source resonator.
However, the integrating of a source resonator within various devices is well known in the art as evidenced by Kurs. Kurs in discussing wireless energy transfer (title) disclose a source resonator (par. 8, source resonators; par. 13, source resonator; par. 385, source resonator). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 12, modified Odaohhara disclose a safety system as in claim 2, Odaohhara further disclose the charger (par. 12, charger), and management subsystem (CPU 61; par. 51-52, based on the CPU 61 it is determined whether to continue or abort operation of charger), but Odaohhara is silent on wherein the charger includes a source resonator, wherein the management subsystem is integrated with the source resonator.
However, the integrating of a source resonator within various devices is well known in the art as evidenced by Kurs. Kurs in discussing wireless energy transfer (title) disclose a source resonator (par. 8, source resonators; par. 13, source resonator; par. 385, source resonator). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 17, modified Odaohhara disclose a safety system as in claim 1,but Odaohhara is silent on wherein the detection subsystem includes a sensor integrated with a device resonator of a vehicle.
However, Brown in discussing a method and apparatus for automatic charging of electrically powered vehicle (title) disclose a sensor using a resonator (par. 80,vehicle has a receiver responsive to a resonant induction to improve power transfer) of a vehicle (par. 85, on-board sensor that detects within some distance of charging). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Brown with the invention of Odaohhara for the purpose of providing an automatic method of charging an electrically powered vehicle (abstract – Brown).
Modified Odaohhara is silent on the particulars of a sensor integrated with a device resonator. Kurs in discussing a wireless energy transfer system (title) disclose a sensor integrated with a device resonator (par. 475, sensor is powered with device resonator). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 34, modified Odaohhara disclose a safety system as in claim 33, Odaohhara further disclose wherein the operational parameter (par. 56-57, formulas are used to determine parameters; par. 59), but Odaohhara is silent on relating to selection of a subset of plural resonators.
However, the use of resonators is well known in the art as determined by Kurs. Kurs in discussing a wireless energy transfer (title) disclose parameters relating to a selection of resonators (par. 70, magnetic resonator with tunable impedance network….may be adjusted in response to data measured by port parameters; par. 122; par. 128-129). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 39, modified Odaohhara disclose a safety system as in claim 1, wherein the detection subsystem (par. 13, detecting means; par. 43, current detection circuit 64 and voltage detection circuit 63; par. 56, abnormal current detection table 73; fig.5), but Odaohhara is silent on includes a magnetometer integrated with a resonator.
However, Kurs in discussing a wireless energy transfer (title) disclose a magnetometer integrated with a resonator (par. 165-170, magnetic resonators). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claim 18 lacks an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown in further view of Flaugher.

Regarding claim 18, modified Odaohhara disclose a safety system as in claim 1, but Odaohhara is silent on wherein the detection subsystem includes an ambient sensor not significantly responsive to whether the object is hot, the detection subsystem configured to use output from the ambient sensor for calibration.
However, Flaugher in discussing battery chargers and methods for extended battery life (title) disclose an ambient sensor not significantly responsive to whether an object is hot (par. 10-11, monitor ambient temperature of batteries based on time period; par. 41, ambient temperature monitors temp of batteries or battery environment; par. 50, measure ambient temperature at or near battery), use output from an ambient sensor for calibration (par. 10-11, based on ambient temperature determine best time for charging battery; fig. 5, item 520; par. 68). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Flaugher with the invention of Odaohhara for the purpose of reducing the heat which causes faster electrolyte dry out and faster positive grid growth, par. 5-6, Flaugher).

Claims 28-30 lack an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown in further view of Bauerle in view of Kurs et al., hereinafter referred to as Kurs.

Regarding claim 28, modified Odaohhara disclose a safety system as in claim 27, but Odaohhara is silent on wherein the coolant dispenser is further configured to provide movement of debris.
However, Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose a coolant dispenser (par. 13, cooling unit 40 to reduce temperature of battery; par. 33, cooling unit reduces temperature of battery unit based on detected battery sensor temperatures). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.
Modified Odaohhara is silent on the providing movement of debris. Furthermore, moving debris is a well known practice in the art as evidenced by Kurs. Kurs in discussing a wireless energy transfer system (title) disclose removing debris (par. 491, preventing debris accumulation). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 29, modified Odaohhara disclose a safety system as in claim 27, but Odaohhara is silent on wherein the coolant dispenser is further configured to move the object.
However, Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose a coolant dispenser (par. 13, cooling unit 40 to reduce temperature of battery; par. 33, cooling unit reduces temperature of battery unit based on detected battery sensor temperatures). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.
Furthermore, Kurs in discussing a wireless energy transfer system (title) disclose moving an object (par. 504, moving an object to provide for optimal power transmission). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Regarding claim 30, modified Odaohhara disclose a safety system as in claim 27, but Odaohhara is silent on wherein the coolant dispenser is integrated with a source resonator of the charger.
However, Bauerle in discussing a system and method for charging a plug-in electric vehicle (title) disclose a coolant dispenser integrated within a charger (par. 11, cooling unit 40 is within battery charger 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Bauerle with the invention of Odaohhara for the purpose of controlling the charging condition so that the vehicle battery is charged in an optimum fashion.
Modified Odaohhara is silent on the particulars of a coolant dispenser being integrated with a source resonator. Furthermore, the integrating of a source resonator within various devices is well known in the art as evidenced by Kurs. Kurs in discussing wireless energy transfer (title) disclose a source resonator (par. 8, source resonators; par. 13, source resonator; par. 385, source resonator). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the source resonator of Kurs with the charger and detection subsystem of Odaohhara for the purpose of enabling useful energy transfer over greater distances and alignment offsets than those realized with traditional induction schemes, but without the limitations and risks inherent in radioactive transmission schemes (par. 7 – Kurs).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claim 45 lacks an inventive step under PCT Article 33(3) as being obvious over Odaohhara in view of Brown in further view of Nilson et al., hereinafter referred to as Nilson.

Regarding claim 45, modified Odaohhara disclose a safety system as in claim 2, but Odaohhara is silent on wherein the management subsystem includes a drain configured for fluid handling proximate to the object.
However, the draining of fluids is notoriously well known in the art as evidenced by Nilson. Nilson in discussing a battery charging assembly for use on a locomotive (title) disclose a drain configured for fluid handling (par. 24, drain valve for oil). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the aforementioned improvements of Nilson with the invention of Odaohhara for the purpose of providing a battery charging assembly which provides an electrical power output which is operable to, on the one hand, maintain the electrical charge of batteries, which are utilized on the locomotive, and further, can be employed to energize electrical devices for remotely controlling the operation of the locomotive (par. 1- Nilson).

Claims 1-56 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Search History:

Limited Classification Search

The Patent Analyst performed a limited classification search within the following US, IPC, ECLA, or F-Term classification areas:

U.S. Class/Subclass(es): 180/65.29; 307/104; 320/108, 109, 149, 152

IPC (8) Class/Subclass(es): B60L 11/18; B60Q 1/52; G01R 31/36; H02J 7/00, 7/02; H04B 5/00; H04M 10/44 (2012.01)

See Global Search Results.

Global Patent Literature Text Search

The Patent Analyst performed the following global text search, which was not limited by classification but may or may not have been limited by other criteria:

PATBASE http://patbase.com/default.asp?nsessionlog=on

- 1) pn=us2010/0277121 (1)
- 2) pn=us2011/0074346 (1)
- 3) pd<20101006 (100000)
- 4) ctb 2 (216)
- 5) 4 and 3 (208)
- 6) 5 and (wireless w3 power) (119)
- 7) 6 and (notif* and indic*) (10)
- 8) PN=(US2010248622 OR US2009286504 OR US2010235006 OR WO10051477 OR US2010109445) (5)
- 9) pn=(us20100156355 or us20020167294) (2)
- 10) (heat w3 paint*) (3904)
- 11) (heat sensitive paint) (100)
- 12) 11 and (wireless power) (1)
- 13) 11 and (detection system) (1)
- 14) 11 and sensor (19)
- 15) pn=us2011/0025264 (1)
- 16) pn=us20070024246 (1)
- 17) (vehicle) and (debris or trash or refuse or garbage) and (cool*) and (drain*) (2842)
- 18) 17 and (remov* w2 (debris or trash or garbage or refuse)) (863)
- 19) 18 and (wireless power) (0)
- 20) 18 and (sensor*) (526)
- 21) 20 and charger (6)
- 22) 18 and charger (11)
- 23) pn=us20060214626 (1)

- 24) IC=("H02J7/02") (10705)
- 25) IC=("H04B5/00") (8781)
- 26) IC=("B60L11/18") (14183)
- 27) IC=("B60Q1/52") (4853)
- 28) IC=("H01M10/44") (18655)
- 29) IC=("H02J7/00") (51447)
- 30) IC=("G01R31/36") (14225)
- 31) IC=("G01R31/36") (14225)
- 32) 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 (96682)
- 33) 32 and 3 (83829)
- 34) 33 and (wireless w3 (power or energy)) (752)
- 35) 34 and (vehicle or car or automobile) (201)
- 36) 35 and (sensor* or detector*) (117)
- 37) 36 and charger (53)
- 38) UC=("320/109") (483)
- 39) UC=("307/104") (1331)
- 40) UC=("320/108") (672)
- 41) UC=("180/65.29") (462)
- 42) UC=("320/149") (312)
- 43) UC=("320/152") (285)
- 44) 38 or 39 or 40 or 41 or 42 or 43 (3314)
- 45) 44 and 3 (2773)
- 46) 45 and charger (984)
- 47) 46 and (sensor* or detector*) (506)
- 48) 47 and (vehicle or car or automobile) (296)
- 49) 48 and (heat or hot or temperat*) w2 (sens*) (121)
- 50) 49 and (fluid or drain) (27)

GOOGLE PATENT http://www.google.com/advanced_patent_search

No. of Hits	Text String
11900	wireless energy distribution system
90	wireless energy distribution system "paint"
24	wireless energy distribution system "paint" resonator
14	wireless vehicle charger paint
791	VEHICLE CHARGER SAFETY SYSTEM AND METHOD
15,300	(detection system) (notification system) (wireless power)
444	monitoring system battery-charger heat-sensor (wireless power) ambient

Computer Accessed Text Databases Searched

The Patent Analyst searched the following computer accessed text databases:

Database: Google Scholar http://scholar.google.com/schhp?hl=en&as_sdt=0,23

No. of Hits	Text String
402	wireless energy distribution system "paint" resonator
10,800	VEHICLE CHARGER SAFETY SYSTEM AND METHOD
30,100	(detection system) (notification system) (wireless power)
12	monitoring system battery-charger heat-sensor (wireless power) ambient

Date search was completed: 12 January 2012

ED/JM

Electronic Acknowledgement Receipt

EFS ID:	14349395
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	John A. Monocello/Kelly Smith
Filer Authorized By:	John A. Monocello
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	05-DEC-2012
Filing Date:	10-SEP-2012
Time Stamp:	13:13:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	IntlAppPCTUS2011054544_ISR_WO.pdf	1018460 549fcb43414b7fe258852686ed195613671b140	no	17

Warnings:	
Information:	

2	Non Patent Literature	Jackson_ClassicalElectrodynamics.pdf	2256647 baa74b49d1f3cf83195ae76b9cc945df2f20ccee	no	33
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3	Non Patent Literature	Jacob_LithiumTantalate.pdf	800497 4f8ce308cba43d547dfa4e8c9d09f4077cb52563	no	5
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4	Non Patent Literature	Karalis_EfficientWireless.pdf	1163442 fb4ae9f13982b508438d52b5a6475acaba4edeea	no	15
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Information:					
5	Non Patent Literature	Karalis_ElectricityUnpluggedFeature.pdf	211642 892e71bbb41ca8cb8f4c77bc90d2c482be555441	no	4
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Information:					
6	Non Patent Literature	Kawamura_WirelessTransmission.pdf	1578851 14d6d9b79a05e38244e40a9967399dfd2a9c61d8	no	6
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7	Non Patent Literature	Konishi_MicrowaveElectronic.pdf	2147158 de291e10bc581b7bde03193f7f16f010cea15c36	no	56
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8	Non Patent Literature	Kurs_OptimizedDesignOfALowResistance.pdf	764130 abe91339c2126e1c12c8d3cc8ac6ac582ed96033	no	3
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9	Non Patent Literature	Kurs_Simultaneous_midrange_power.pdf	121689 50b9ab42b88dc49168b019f6ccb593031b9de1af	no	3
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10	Non Patent Literature	Kurs_WirelessPowerTransfer.pdf	192453 9ed1167d68b6230bf35296a87b23df25153b0e22	no	4
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11	Non Patent Literature	Lamb_LookMa.pdf	185044 80a91c4272744e79fc05bcf2ba70018484b8e88d	no	2
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13	Non Patent Literature	Lee_RFIDCoilDesign.pdf	430451 4c6c42a13890f52c169b3fac77c2f37f9217d04d	no	21
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14	Non Patent Literature	Liang_SiliconWaveguide.pdf	181075 bb241d426923209b375321047a7b73b09df6f4c6	no	3
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28	Non Patent Literature	PR_Newswire_TheBigStory.pdf	97703 a98cb9a08a6b0740ffcad7205cf8cdc91a12cfff	no	3
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31	Non Patent Literature	Reidy_MITDiscoveryCould.pdf	209466 979ea2bbb69e1c4a3841fa707ea33399fdc21712	no	3
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32	Non Patent Literature	Risen_WirelessEnergy.pdf	102676 8c42661742ffec847629df84e662a692e62db437	no	1
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33	Non Patent Literature	Sakamoto_ANovelCircuit.pdf	645179 50a5e9ee06622d9f6e78601194c529ee46397c1e	no	3
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34	Non Patent Literature	Scheible_NovelWirelessPower.pdf	791528 057f828f20d8aaa13d14dd3667177264373537e8	no	6
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35	Non Patent Literature	Schneider_ElectronsUnplugged.pdf	1503656 a4eda83867bdc84b93ea67ae4dfe848c57f0bd09	no	6
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36	Non Patent Literature	Schuder_AnInductivelyCoupled.pdf	4491661 d6f09cbb03b0bf2cb6b8402871fe0f35040d4c96	no	9
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37	Non Patent Literature	Schuder_EnergyTransportInto.pdf	5756325 89fe6760a72370181146b86a20c0beb3c52b0e02	no	8
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38	Non Patent Literature	Schuder_PoweringAnArtificial.pdf	194656 36b69cc8ed8e9adf06c010cb2e5bcea5a43c7c09	no	7
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39	Non Patent Literature	Schutz_LoadAdaptive.pdf	1183972 c53194fb482ab2f214bac1ba972fbc8118d5d822	no	6
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Information:					
40	Non Patent Literature	Sekitani_ALargeAreaFlexible.pdf	3756301 5ec0c4d62e8c4e254473685988469caaf72cb168	no	4
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41	Non Patent Literature	Sekitani_ALargeAreaWireless.pdf	556288 042882bf010a3154aaf7a1d9382d6e47deb2a1f3	no	5
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42	Non Patent Literature	Sekiya_FMPWMControlScheme.pdf	393690 f72aaa77c5a6ce5b9b4f8a096dd490014b5e320b	no	11
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43	Non Patent Literature	Senge_MITWireless.pdf	71550 b229e0f6f20b1b21777eb0cbc56b29791a1825fa	no	1
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44	Non Patent Literature	Sensiper_ElectromagneticWavePropogation.pdf	8035951 aea5ad57c6d5c6fa8ea4af38658f261de01abab1	no	126
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45	Non Patent Literature	Soljacic_PhotonicCrystalSlow.pdf	429741 2f3f19fac03bd3bd1d04c04604caf6e3dc718b46	no	8
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46	Non Patent Literature	Soljacic_WirelessEnergyTransfer.pdf	825817 0c528b37217358092abd8e6f0d19dc5a922c6db3	no	3
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47	Non Patent Literature	Soljacic_WirelessNonRadiativeEnergy_PPT.pdf	6786039 98bb64a6e040227d05933f0dfac28144b97efefd	no	14
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48	Non Patent Literature	Soljacic_WirelessNonradiativeEnergyTransfer.pdf	2636887 ebbafc12e22fcff1e4bd8465fdaa03f8b1e72268	no	15
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49	Non Patent Literature	Someya_TheWorldsFirst.pdf	1483552 66d8b16d02019bfdef5034c99d06d5b54a307da9	no	18
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52	Non Patent Literature	Tesla_HighFrequencyOscillators.pdf	103433 922775e6d40d5df9d37da095af6f3d60e9df443d	no	11
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Warnings:					
Information:					
		Total Files Size (in bytes):	104051039		

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<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/608,956

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	390
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	*			OR	x 62 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1260

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/608,956	09/10/2012	2617	1380	WTCY-0064-P01	19	2

CONFIRMATION NO. 4270

UPDATED FILING RECEIPT

87084
GTC Law Group LLP & Affiliates
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

OC000000058018086

Date Mailed: 12/12/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Simon Verghese, Arlington, MA;
Morris P. Kesler, Bedford, MA;
Katherine L. Hall, Arlington, MA;
Herbert Toby Lou, Carlisle, MA;

Applicant(s)

Simon Verghese, Arlington, MA;
Morris P. Kesler, Bedford, MA;
Katherine L. Hall, Arlington, MA;
Herbert Toby Lou, Carlisle, MA;

Assignment For Published Patent Application

WITRICITY CORPORATION, Watertown, MA

Power of Attorney: The patent practitioners associated with Customer Number 87084

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/532,785 09/09/2011

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 09/20/2012
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/608,956**

Projected Publication Date: 03/21/2013

Non-Publication Request: No

Early Publication Request: No

Title

FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

Preliminary Class

455

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/608,956	09/10/2012	Simon Verghese	WTCY-0064-P01

CONFIRMATION NO. 4270

87084
GTC Law Group LLP & Affiliates
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

PUBLICATION NOTICE



Title:FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

Publication No.US-2013-0069441-A1
Publication Date:03/21/2013

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	12	8441154	B2	2013-05-14	Karalis, Aristeidis et al.	

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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Art Unit	2836
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Attorney Docket Number	WTCY-0064-P01

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Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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Modified PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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	52	09298847	JP	A	1997-11-18	Chiba, Yoji	English Abstract Only	☐
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Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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	82	2013059441	WO	A1	2013-04-25	Lou, Herbert et al.		☐
	83	2013036947	WO	A3	2013-05-02	Verghese, Simon et al.		☐
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NON-PATENT LITERATURE DOCUMENTS

Modified PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Modified PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e) (1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e) (2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jeffrey R. Ambroziak/	Date (YYYY-MM-DD)	2013-08-07
Name/Print	Jeffrey R. Ambroziak	Registration Number	47387

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Electronic Acknowledgement Receipt

EFS ID:	16521022
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	John A. Monocello/Sarah Trigg
Filer Authorized By:	John A. Monocello
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	07-AUG-2013
Filing Date:	10-SEP-2012
Time Stamp:	11:01:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	WTCY-0064-P01_IDS_CL_08-07-13.pdf	45855 7899e9aec2e39bfb174cf4d00ec4ab35c809b84a	no	3

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Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	WTCY-0064-P01_SIDS_08-07-13.pdf	394996 053975e0a33909a804dd4e927cefa566e11ea8ce	no	9
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36	Foreign Reference	WO2013013235A3.pdf	51136 3ef50d5f575a470f51c2ed349080bc14b13bd7f9	no	3
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37	Non Patent Literature	EP111840666_EESR_03-28-13.pdf	344927 b4481d9853c154822f25e4b6b7ac92a856fe5c47	no	7

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			Total Files Size (in bytes):	72091992	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Simon Verghese, et al.	Examiner: Not Yet Assigned
Serial No.:	13/608,956	Group Art Unit: 2617
		Confirmation No.: 4270
Filed:	Sep 10, 2012	Docket No.: WTCY-0064-P01
Title:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Pursuant to the requirements of 37 C.F.R. § 1.97, Applicant hereby submits this Supplemental Information Disclosure Statement which includes completed Form(s) PTO/SB/08a.

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 et. seq., the referenced materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Supplemental Information Disclosure Statement be entered and the documents listed on the attached Form(s) PTO/SB/08a be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the PTO/SB/08a form(s), initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Applicant(s) has included copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

Further, Applicant(s) respectfully direct the Examiner's attention to the below-listed related non-published applications. These items, which refer to non-published applications that, at this time and according to each application's current prosecution history, may be related to the prosecution of the present case. Related published applications are provided on the accompanying form SB08 where applicable. Applicants' reference to the co-pending applications is not an admission of the materiality of any application or the prosecution history thereof, nor is it an admission that any of the below or attached co-pending applications constitute prior art.

UN PUB. APPLICATION NO.	FILING DATE	ATTORNEY DOCKET NO.	STATUS
13/534,966	27-Jun-12	WTCY-0076-P01	Pending
13/562,528	31-Jul-12	WTCY-0077-P01	Pending
13/562,553	31-Jul-12	WTCY-0078-P01	Pending
13/752,169	28-Jan-13	WTCY-0075-P01	Pending
13/834,366	15-Mar-13	WTCY-0086-P01	Pending
13/834,428	15-Mar-13	WTCY-0086-P02	Pending
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13/912,723	7-Jun-13	WTCY-0020-P02 -T	Pending
13/923,366	21-Jun-13	WTCY-0020-P03 -T	Pending
13/944,693	17-Jul-13	WTCY-0081-P01 - T	Pending
13/946,056	19-Jul-13	WTCY-0040-P02 - T	Pending
13/946,066	19-Jul-13	WTCY-0040-P03 - T	Pending
13/946,070	19-Jul-13	WTCY-0040-P04 - T	Pending
PCT/US2013/023478	28-Jan-13	WTCY-0075-PWO	Pending
PCT/US2013/033599	22-Mar-13	WTCY-0055-PWO	Pending
PCT/US2013/048210	27-Jun-13	WTCY-0096-PWO	Pending

Pursuant to 37 C.F.R. §1.97(b), it is believed that no fee is required with the Supplemental Information Disclosure Statement. However, if an Office Action on the merits has been mailed, Applicant(s) hereby authorize the Commissioner to charge any additional fees to Deposit Account 50-3912 in order to have this Supplemental Information Disclosure Statement considered.

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this communication.

Respectfully submitted,

SIMON VERGHESE, ET AL.

By their Representatives,

Customer No. 87084

Date August 7, 2013

By /Jeffrey R. Ambroziak/
Jeffrey R. Ambroziak
GTC Law Group LLP & Affiliates
Reg. No. 47387
Office: (203) 535-3879

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number: 26161

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number: 26161

OR

☐ Firm or Individual Name	Fish & Richardson P.C.		
Address	P.O. Box 1022		
City	Minneapolis	State MN	Zip 55440-1022
Country	United States		
Telephone		Email	

Assignee Name and Address:
WiTricity Corporation
149 Grove Street
Watertown, MA 02472

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date 10/15/13
Name	Eric R. Giler	Telephone 857-228-1229
Title	Chief Executive Office	

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

American LegalNet, Inc.
www.FormsWorkflow.com

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Verghese, et al.

Application No./Patent No.: 13/608,956 Filed/Issue Date: 9/10/2012

Entitled: Foreign Object Detection In Wireless Energy Transfer Systems

WiTricity Corporation
(Name of Assignee)

a corporation
(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
   The extent (by, percentage) of its ownership interest is _____%
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

in the patent application/patent identified above by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel (029400), Frame (0278), or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.
[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.8]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Marc M. Wefers Reg. No. 56,842/	October 15, 2013
Signature	Date
Marc M. Wefers, 56,842	(617) 542-5070
Printed or Typed Name	Telephone Number
Attorney for Assignee	
Title	

Electronic Acknowledgement Receipt

EFS ID:	17137416
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	87084
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	WTCY-0064-P01
Receipt Date:	16-OCT-2013
Filing Date:	10-SEP-2012
Time Stamp:	08:35:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	POA.pdf	129976 ebb4ecc252bd02e75e6341ac33ebc736546801c5	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	129976

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/608,956	09/10/2012	Simon Verghese	WTCY-0064-P01

CONFIRMATION NO. 4270

POWER OF ATTORNEY NOTICE

87084
GTC Law Group LLP & Affiliates
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P.O. Box 52050
Minneapolis, MN 55402

OC00000064447074

Date Mailed: 10/23/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/16/2013.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/608,956	09/10/2012	Simon Verghese	25236-0036001

CONFIRMATION NO. 4270

26161
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

POA ACCEPTANCE LETTER

OC00000064447132

Date Mailed: 10/23/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/16/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		First Named Inventor Simon Verghese	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A1	D541,322	4/24/2007	Garrett et al.			
	A2	D545,855	7/3/2007	Garrett et al.			
	A3	4,180,795	12/25/1979	Matsuda et al.			
	A4	4,450,431	5/22/1984	Hochstein			
	A5	4,588,978	5/13/1986	Allen			
	A6	5,033,295	7/23/1991	Schmid et al.			
	A7	5,034,658	7/23/1991	Hiering et al.			
	A8	5,229,652	7/20/1993	Hough			
	A9	5,374,930	12/20/1994	Schuermann			
	A10	5,541,604	7/30/1996	Meier			
	A11	5,703,573	12/30/1997	Fujimoto et al.			
	A12	5,710,413	1/20/1998	King et al.			
	A13	5,821,728	10/13/1998	Sshwind			
	A14	5,864,323	1/26/1999	Berthon			
	A15	5,903,134	5/11/1999	Takeuchi			
	A16	5,959,245	9/28/1999	Moe et al.			
	A17	6,047,214	4/4/2000	Mueller et al.			
	A18	6,176,433	1/23/2001	Uesaka et al.			
	A19	6,459,218	10/1/2002	Boys et al.			
	A20	6,473,028	10/29/2002	Luc			
	A21	6,561,975	5/13/2003	Pool et al.			
	A22	6,563,425	5/13/2003	Nicholson et al.			
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	A25	6,696,647	2/24/2004	Ono et al.			
	A26	6,703,921	3/9/2004	Wuidart et al.			
	A27	6,803,744	10/12/2004	Sabo			
	A28	6,839,035	1/4/2005	Addonisio et al.			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
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(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A29	6,988,026	1/17/2006	Breed et al.			
	A30	7,471,062	12/30/2008	Bruning			
	A31	7,521,890	4/21/2009	Lee et al.			
	A32	7,545,337	6/9/2009	Guenther			
	A33	7,825,544	11/2/2010	Jansen, et al.			
	A34	7,835,417	11/16/2010	Heideman et al.			
	A35	7,844,306	11/30/2010	Shearer et al.			
	A36	7,880,337	2/1/2011	Farkas			
	A37	7,884,697	2/8/2011	Wei et al.			
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	A39	7,932,798	4/26/2011	Tolle et al.			
	A40	7,936,147	5/3/2011	Kook			
	A41	7,948,209	5/24/2011	Jung			
	A42	7,963,941	6/21/2011	Wilk			
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	A44	8,030,887	10/4/2011	Jung			
	A45	8,178,995	5/15/2012	Amano et al.			
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	A49	8,260,200	9/4/2012	Shimizu et al.			
	A50	8,314,513	11/20/2012	Aoyama et al.			
	A51	8,334,620	12/18/2012	Park et al.			
	A52	8,362,651	1/29/2013	Hamam et al.			
	A53	8,369,905	2/5/2013	Sogabe et al.			
	A54	8,395,282	3/12/2013	Joannopoulos et al.			
	A55	8,395,283	3/12/2013	Joannopoulos et al.			
	A56	8,400,018	3/19/2013	Joannopoulos et al.			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A57	8,400,019	3/19/2013	Joannopoulos et al.			
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	A65	8,461,817	6/11/2013	Martin, et al.			
	A66	8,482,157	7/9/2013	Cook et al.			
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	A68	8,569,914	10/29/2013	Karalis et al.			
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	A73	8,629,578	1/14/2014	Kurs et al.			
	A74	8,643,326	2/4/2014	Campanella et al.			
	A75	2003/0160590	8/28/2003	Schaefer et al.			
	A76	2004/0026998	2/12/2004	Henriott et al.			
	A77	2004/0130425	7/8/2004	Dayan et al.			
	A78	2005/0116683	6/2/2005	Cheng et al.			
	A79	2005/0125093	6/9/2005	Kikuchi et al.			
	A80	2005/0135122	6/23/2005	Cheng et al.			
	A81	2005/0151511	7/14/2005	Chary			
	A82	2005/0189945	9/1/2005	Reiderman			
	A83	2006/0001509	1/5/2006	Gibbs			
	A84	2006/0010902	1/19/2006	Trinh et al.			

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Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		First Named Inventor Simon Verghese	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A85	2006/0053296	3/9/2006	Busboom et al.			
	A86	2006/0090956	5/4/2006	Peshkovskiy et al.			
	A87	2007/0105429	5/10/2007	Kohl et al.			
	A88	2007/0126650	6/7/2007	Guenther			
	A89	2007/0164839	7/19/2007	Naito			
	A90	2007/0257636	11/8/2007	Phillips et al.			
	A91	2008/0051854	2/28/2008	Bulkes et al.			
	A92	2008/0047727	2/28/2008	Sexton et al.			
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	A95	2008/0197802	8/21/2008	Onishi et al.			
	A96	2008/0238364	10/2/2008	Weber et al.			
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	A101	2009/0079387	3/26/2009	Jin et al.			
	A102	2009/0102296	4/23/2009	Green et al.			
	A103	2009/0115628	5/7/2009	Dicks et al.			
	A104	2009/0161078	6/25/2009	Wu et al.			
	A105	2009/0224723	9/10/2009	Tanabe			
	A106	2009/0273318	11/5/2009	Rondoni et al.			
	A107	2009/0322280	12/31/2009	Kamijo et al.			
	A108	2010/0015918	1/21/2010	Liu et al.			
	A109	2010/0104031	4/29/2010	Lacour, Gilles			
	A110	2010/0179384	7/15/2010	Hoeg et al.			
	A111	2010/0181964	7/22/2010	Huggins et al.			
	A112	2010/0188183	7/29/2010	Shpiro			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		First Named Inventor Simon Verghese	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A113	2010/0201312	8/12/2010	Kirby et al.			
	A114	2010/0244767	9/30/2010	Turner et al.			
	A115	2010/0256481	10/7/2010	Mareci et al.			
	A116	2010/0314946	12/16/2010	Budde et al.			
	A117	2010/0328044	12/30/2010	Waffenschmidt et al.			
	A118	2011/0031928	2/10/2011	Soar			
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	A120	2011/0278943	11/17/2011	Eckhoff et al.			
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	A123	2012/0025602	2/2/2012	Boys et al.			
	A124	2012/0038525	2/16/2012	Monsalve Carcelen et al.			
	A125	2012/0049650	3/1/2012	Bella			
	A126	2012/0146575	6/14/2012	Armstrong et al.			
	A127	2012/0175967	7/12/2012	Dibben et al.			
	A128	2012/0267960	10/25/2012	Low et al.			
	A129	2013/0069441	3/21/2013	Verghese et al.			
	A130	2013/0154383	6/20/2013	Kasturi et al.			
	A131	2013/0200716	8/8/2013	Kesler et al.			
	A132	2013/0200721	8/8/2013	Kurs et al.			
	A133	2013/0221744	8/29/2013	Hall et al.			
	A134	2013/0278073	10/24/2013	Kurs et al.			
	A135	2013/0278074	10/24/2013	Kurs et al.			
	A136	2013/0278075	10/24/2013	Kurs et al.			
	A137	2013/0300353	11/14/2013	Kurs et al.			
	A138	2013/0307349	11/21/2013	Hall et al.			
	A139	2013/0320773	12/5/2013	Schatz et al.			
	A140	2013/0334892	12/19/2013	Hall et al.			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		First Named Inventor Simon Verghese	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A141	2014/0002012	1/2/2014	McCauley et al.			
	A142	2014/0070764	3/13/2014	Keeling			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	B1	CN 102439669	5/2/2012	China			Abstract	
	B2	CN 103329397	9/25/2013	China			Abstract	
	B3	EP 1 521 206	04/06/2005	Europe				
	B4	EP 1 524 010	4/20/2005	Europe				
	B5	JP 6-341410	12/13/1994	Japan			Abstract	
	B6	JP 9-182323	7/11/1997	Japan			Abstract	
	B7	JP 2004-229144	8/12/2004	Japan			Abstract	
	B8	JP 2006-074848	3/16/2006	Japan			Abstract	
	B9	JP 2007-266892	10/11/2007	Japan			Abstract	
	B10	JP 2013-543718	12/5/2013	Japan			Not Available	
	B11	KR 10-2007-0017804	2/13/2007	Korea			Abstract	
	B12	SG 112842	7/28/2005	Singapore			Partial Translation	
	B13	WO 95/11545	04/27/1995	WIPO				
	B14	WO 2004/015885	2/19/2004	WIPO				
	B15	WO 2013/113017	8/1/2013	WIPO				
	B16	WO 2013/142840	9/26/2013	WIPO				
	B17	WO 2014/004843	1/3/2014	WIPO				

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		First Named Inventor Simon Verghese	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2617

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	C1	"Next Little Thing 2010 Electricity without wires", CNN Money (See money.cnn.com/galleries/2009/smallbusiness/0911/gallery.next_little_thing_2010.smb/) (dated November 30, 2009)
	C2	Ahmadian, M. et al., "Miniature Transmitter for Implantable Micro Systems", Proceedings of the 25th Annual International Conference of the IEEE EMBS Cancun, Mexico, pp. 3028-3031 (September 17-21, 2003)
	C3	Borenstein, S., "Man tries wirelessly boosting batteries", (The Associated Press), USA Today, (November 16, 2006) 1 page
	C4	Budhia, M. et al., "A New IPT Magnetic Coupler for Electric Vehicle Charging Systems", IECON 2010 - 36th Annual Conference on IEEE Industrial Electronics Society, Glendale, AZ, pp. 2487-2492 (Nov. 7-10, 2010)
	C5	Budhia, M. et al., "Development and evaluation of single sided flux couplers for contactless electric vehicle charging", 2011 IEEE Energy Conversion Congress and Exposition (ECCE), Phoenix, AZ, pp. 614-621 (September 17-22, 2011)
	C6	Budhia, M. et al.,"Development of a Single-Sided Flux Magnetic Coupler for Electric Vehicle IPT", IEEE Transactions on Industrial Electronics, Vol. 60:318-328 (January 2013)
	C7	Eisenberg, Anne, "Automatic Recharging, From a Distance", The New York Times, (see www.nytimes.com/2012/03/11/business/built-in-wireless-chargeing-for-electronic-devices.html?_r=0) (published on March 10, 2012)
	C8	Fan, Shanhui et al., "Rate-Equation Analysis of Output Efficiency and Modulation Rate of Photomic-Crystal Light-Emitting Diodes", IEEE Journal of Quantum Electronics, Vol. 36(10):1123-1130 (October 2000)
	C9	Ferris, David, "How Wireless Charging Will Make Life Simpler (And Greener)", Forbes (See forbes.com/sites/davidferris/2012/07/24/how-wireless-charging-will-make-life-simpler-and-greener/print/) (dated July 24, 2012)
	C10	Finkenzeller, Klaus, "RFID Handbook – Fundamentals and Applications in Contactless Smart Cards", Nikkan Kohgyo-sya, Kanno Taihei, first version, pp. 32-37, 253 (August 21, 2001)
	C11	Finkenzeller, Klaus, "RFID Handbook (2nd Edition)", The Nikkan Kogyo Shimbun, Ltd., pp. 19, 20, 38, 39, 43, 44, 62, 63, 67, 68, 87, 88, 291, 292 (Published on May 31, 2004)
	C12	Ho, S. L. et al., "A Comparative Study Between Novel Witricity and Traditional Inductive Magnetic Coupling in Wireless Charging", IEEE Transactions on Magnetics, Vol. 47(5):1522-1525 (May 2011)
	C13	Moskvitch, Katia, "Wireless charging – the future for electric cars?", BBC News Technology (See www.bbc.co.uk/news/technology-14183409) (dated July 21, 2011)
	C14	Schneider, D. "A Critical Look at Wireless Power", IEEE Spectrum, pp. 35-39 (May 2010)
	C15	Stewart, W., "The Power to Set you Free", Science, Vol. 317:55-56 (July 6, 2007)
	C16	Tang, S.C. et al., "Evaluation of the Shielding Effects on Printed-Circuit-Board Transformers Using Ferrite Plates and Copper Sheets", IEEE Transactions on Power Electronics, Vol. 17:1080-1088 (November 2002)
	C17	Villeneuve, Pierre R. et al., "Microcavities in photonic crystals: Mode symmetry, tunability, and coupling efficiency", Physical Review B, Vol. 54:7837-7842 (September 15, 1996)

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		Filing Date September 10, 2012	Group Art Unit 2617

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	C18	Yates, David C. et al., "Optimal Transmission Frequency for Ultralow-Power Short-Range Radio Links", IEEE Transactions on Circuits and Systems - 1, Regular Papers, Vol. 51:1405-1413 (July 2004)
	C19	Ziaie, Babak et al., "A Low-Power Miniature Transmitter Using A Low-Loss Silicon Platform For Biotelemetry", Proceedings - 19th International Conference IEEE/EMBS, pp. 2221-2224, (October 30 - November 2, 1997) 4 pages
	C20	PCT/US2012/054490, International Application Serial No. PCT/US2012/054490, International Preliminary Report on Patentability and Written Opinion mailed March 20, 2014, 9 pages
	C21	PCT/US2011/054544, International Preliminary Report on Patentability for PCT/US2011/054544, mailed on April 18, 2013, 13 pages
	C22	Amrany, Adi, Final Office Action, U.S. Appl. Serial No. 12/899,281, mailed on June 24, 2014 (14 pages)
	C23	Amrany, Adi, Final Office Action, U.S. Appl. Serial No. 12/899,281, mailed on December 6, 2013 (8 pages)
	C24	Amrany, Adi, Final Office Action, U.S. Appl. Serial No. 12/899,281, mailed on September 6, 2013, 12 pages
	C25	Amrany, Adi, Non-Final Office Action, U.S. Appl. Serial No. 12/899,281, mailed on May 23, 2013 (11 pages)
	C26	Amrany, Adi, Restriction Requirement, U.S. Appl. Serial No. 12/899,281, mailed on March 21, 2013 (7 pages)
	C27	Fish & Richardson, Reply to Action of December 6, 2013, U.S. Appl. Serial No. 12/899,281, filed on May 6, 2014, 15 pages
	C28	Fenwick & West LLP, Amendment B under 37 C.F.R. § 1.116, U.S. Appl. Serial No. 12/899,281, filed on November 26, 2013, 11 pages
	C29	Fenwick & West LLP, Response and Amendment A Under 37 C.F.R. § 1.111, U.S. Appl. Serial No. 12/899,281, filed on August 23, 2013, 16 pages
	C30	Fenwick & West LLP, Response to Restriction Requirement, U.S. Appl. Serial No. 12/899,281, filed on April 19, 2013, 14 pages

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Electronic Acknowledgement Receipt

EFS ID:	20021591
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	William E. Hunter/Lakeisha Bryant
Filer Authorized By:	William E. Hunter
Attorney Docket Number:	25236-0036001
Receipt Date:	02-SEP-2014
Filing Date:	10-SEP-2012
Time Stamp:	15:42:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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New Applications Under 35 U.S.C. 111

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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	2617
Serial No.	:	13/608,956	Examiner	:	Unknown
Filed	:	September 10, 2012	Conf. No.	:	4270
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request. A copy of a communication from a foreign patent office in a counterpart application is also enclosed.

This statement is being filed within three months of the filing date of the application or before the receipt of a first Office Action on the merits. Please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: September 2, 2014

/William E. Hunter/
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Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Verghese, et al.	
		Filing Date September 10, 2012	Group Art Unit

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2	DE 20 2009 009693	11/25/2010	Germany	H02J	17/00	Machine Translation	

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3	Copy of Supplementary European Search Report for European Application No. EP 12 83 0255 dated April 8, 2015 (3 pages)
	4	Copy of EPO Communication for European Application No. 12 830 255.1 dated April 28, 2015 (6 pages)

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Electronic Acknowledgement Receipt

EFS ID:	22200328
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	25236-0036001
Receipt Date:	29-APR-2015
Filing Date:	10-SEP-2012
Time Stamp:	11:37:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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	Multipart Description/PDF files in .zip description		
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		Total Files Size (in bytes):	1270191		

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Serial No.	:	13/608,956	Examiner	:	Unknown
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Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 29, 2015

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Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit Unknown

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A1	4,843,259	6/27/1989	Weisshaupt			
	A2	7,868,588	1/11/2011	Altekruse et al.			
	A3	7,879,483	2/1/2011	Sakakibara			
	A4	8,241,097	8/14/2012	Zhu et al.			
	A5	8,269,375	9/18/2012	Sogabe et al.			
	A6	8,310,107	11/13/2012	Jin			
	A7	8,344,688	1/1/2013	Yoda et al.			
	A8	8,446,046	5/21/2013	Fells et al.			
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	A11	2009/0095449	4/16/2009	Bandai et al.			
	A12	2009/0167253	7/2/2009	Muraoka et al.			
	A13	2009/0278523	11/12/2009	Yoda et al.			
	A14	2009/0284341	11/19/2009	Okada et al.			
	A15	2011/0318618	12/29/2011	Yajima et al.			
	A16	2013/0063085	3/14/2013	Takada et al.			
	A17	2014/0049422	2/20/2014	von Novak et al.			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	B1	CN 101807822	08/18/2010	China			Abstract	
	B2	DE 10 2011 015980	10/4/2012	Germany			Abstract	
	B3	FR 2 968 616	06/15/2012	France			Abstract	
	B4	EP 2 410 631	01/25/2012	EPO				
	B5	JP H6-2975	01/14/1994	Japan			X	
	B6	JP 2000-134830	5/12/2000	Japan			X	
	B7	JP 2008-17562	01/24/2008	Japan			X	

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit Unknown

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	B8	JP 2009-213295	09/17/2009	Japan			X	
	B9	JP 2009-273260	11/19/2009	Japan			See US 2009/0278523	
	B10	WO 00/23823	04/27/2000	WIPO				
	B11	WO 2009/081115	07/02/2009	WIPO				
	B12	WO 2010/106648	09/23/2010	WIPO			Abstract/See EP 2410631	
	B13	WO 2010/136927	12/02/2010	WIPO				

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	C1	Copy of Australian Patent Examination Report No. 1 for Australian Application No. 2011312376 by Examiner Soosa Gnanasingham dated May 26, 2014 (3 pages)
	C2	Copy of Supplementary European Search Report for Application No. 11831382 by Examiner Matthias Holz dated January 26, 2015 (8 pages)
	C3	PCT/US2013/065963, International Application No. PCT/US2013/065963, International Search Report and Written Opinion, mailed on October 29, 2014, 14 pages
	C4	PCT/US2013/065963, International Application No. PCT/US2013/065963, International Preliminary Report on Patentability, mailed on April 30, 2015, 11 pages
	C5	Copy of Canadian Office Action for Application No. 2,813,678 by Examiner Rajiv Agarwal dated 2/24/2015 (4 pages)
	C6	Copy of Japanese Office Action for Japanese Application No. 2013-532855 dated 3/2/2015 (9 pages)
	C7	The State Intellectual Property Office of the People's Republic of China, English Translation of the Notification of the First Office Action issued on December 1, 2014 for CN Appl. No. CN201180055093.2, 41 pages

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Electronic Acknowledgement Receipt

EFS ID:	22295705
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Marc M. Wefers/Lakeisha Bryant
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	25236-0036001
Receipt Date:	08-MAY-2015
Filing Date:	10-SEP-2012
Time Stamp:	15:34:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	CN101807822A.pdf	645002 c45a3d0468468302705cdb7a0170bdb908153ef7	no	12

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Information:	

2	Foreign Reference	DE102011015980-AB-2.pdf	488948 1d7383d5a7ac3cc88daa8943077af9ded8da0956	no	19
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3	Foreign Reference	FR2968616.pdf	1099718 53fc2ddbf00143556341578ec12ae6d41df3e530	no	22
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4	Foreign Reference	EP2410631.pdf	2159764 3d7046c2676ad94f73378de14dbf596b993e4ea4	no	17
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5	Foreign Reference	JPH62975.pdf	191935 5c7961ba07b3b736640001022ef59f7a87c9ca33	no	6
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6	Foreign Reference	JP2000134830.pdf	1076090 0f71ccfa89232586184dc0c2fff3910189b8d674	no	20
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7	Foreign Reference	JP2008017562.pdf	1128122 1bebc9a09e80580ff1a2ebe93a9dc02fdb11f533	no	25
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8	Foreign Reference	JP2009213295.pdf	3403285 95a9e74f6dedc2649044c625244df7973d86ee1c	no	76
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9	Foreign Reference	JP2009273260.pdf	581019 a9846f3fe20fd92290c9b36796636b6915d249aa	no	15
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10	Foreign Reference	WO2000023823.pdf	960785 8a0473002b1ff0d6f3c1a023a127f660e9cb8c9f	no	21
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11	Foreign Reference	WO2009081115.pdf	3202962 7926d61f82071b8c45b8761f0839a4970d99f5ab	no	85
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12	Foreign Reference	WO2010106648.pdf	24616307 4aeece11d3ec49113dc0c7f4cfa30f7a72b241ef	no	27
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Information:					
13	Foreign Reference	WO2010136927.pdf	1856526 440230135d359452a53c8a9da236f9f8b9c00b2d	no	47
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14	Non Patent Literature	AU-OA_05262014-0048AU1.pdf	161083 2c505a5654247ca40883763dbb8706f642a2b704	no	3
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15	Non Patent Literature	EP-SUPPESR-01262015.pdf	384483 4ac315998804ec5b47638e9ad750f87a5a9b9879	no	8
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16	Non Patent Literature	PCTUS2013065963_IPRP_0028WO1.pdf	459942 1b75308ed8c2fa7f41bf13c70be1ea2357acbd41	no	11
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17	Non Patent Literature	PCTUS2013065963_0028WO1_10242014.pdf	642425 99649f53b93892696fa8a8ef17bf5144abb6a8d1	no	14
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18	Non Patent Literature	CA-OA_02242015-0048CA1.pdf	227548 113a827cd72817f399f4a1aca955f885f10413f8	no	4
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19	Non Patent Literature	JP-OA_03022015-0048JP1.pdf	411313 d66c88db1cf65ecd99acf331e4cddb3100c3baf4	no	9
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20	Non Patent Literature	CN_OA.pdf	2094932 b87d88d1d2bbda9b9ee41f5ea82f3749baf50257	no	41
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Information:					
21		IDS.pdf	121524 795ba063426486bece15caaf1d5fb4c754a8a011	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Information Disclosure Statement (IDS) Form (SB08)	2	3

Warnings:	
Information:	
Total Files Size (in bytes):	45913713

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	Unknown
Serial No.	:	13/608,956	Examiner	:	Unknown
Filed	:	September 10, 2012	Conf. No.	:	4270
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the attached Disclosure Form. Foreign patent documents and non-patent literature are attached; cited U.S. patents and patent application publications will be provided on request.

This statement is being filed before the receipt of a first action on the merits.

Apply any necessary charges or credits to deposit account 06-1050, referencing attorney docket number 25236-0036001.

Respectfully submitted,

Date: May 8, 2015

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23390856.doc

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3771	320/108.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 16:00
S1	13	"608956".ap.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/16 13:23
S2	638	("20130057364" | "20130069753" | "20130099587" | "6238387" | "8471410" | "20060001509" | "20100179384" | "20100328044" | "20110049995" | "20120025602" | "20130200721" | "20140002012" | "5959245" | "6563425" | "6650227" | "6839035" | "7835417" | "8369905" | "8395282" | "8400021" | "8400023" | "8457547" | "8552592" | "8587153" | "20020056233" | "20090284341" | "20060219448" | "20090218884" | "20110215086" | "20110248573" | "20130154389" | "20130159956" | "8410636" | "8461719" | "8461721" | "8476788" | "20060090956" | "20070126650" | "20070257636" | "20100201312" | "20110278943" | "20140070764" | "4450431" | "4588978" | "5374930" | "5541604" | "6696647" | "7545337" | "8030887" | "8395283" | "20090278523" | "20110318618" | "4843259" | "8269375" | "20100234922" | "20110266878" | "20130175875" | "20030160590" | "20050151511" | "20060053296" | "20090161078" | "20100314946" | "20120146575" | "20130300353" | "20130334892" | "5703573" | "5710413" | "5821728" | "6176433" | "6561975" | "8260200" | "8406823" | "8629578" | "D545855" | "8310107" | "20030071034" | "20130175874" | "7554316" | "7994880" | "8400017" | "8497601" | "20040026998" | "20040130425" | "20070164839" | "20080047727" | "20080132909" | "20080238364" | "20090115628" | "20090322280" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/16 13:31

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S3	70	verghese-simon.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:09
S4	283	kesler-morris-p.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:10

S5	296	hall-katherine-l.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:16
S6	30	lou-herbert-toby.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:17
S7	150	witricity.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:18
S8	6017	307/104.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:25
S9	631	g01r33/10.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:26
S10	965	g01v3/10.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:26
S11	7706	h02j17/00.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:26
S12	11228	h02j5/005.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:26
S13	4116	h01f27/2804.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2015/07/17 10:26

			DERWENT; IBM_TDB			
S14	9113	h01f38/14.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:26
S15	29323	(S8 or S9 or S10 or S11 or S12 or S13 or S14)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:27
S16	325	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) near2 (sens$3 detect$3 monitor$3 measur$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:38
S17	1	S16 same ((magnetic adj field) near2 gradiometer) same (feedback feed-back (fed adj back))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:39
S18	160	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) adj (sens$3 detect$3 monitor$3 measur$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 10:57
S19	14	"933264".ap.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 11:13
S20	75	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 11:18
S21	13	S20 same (readout display)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 11:19
S22	18	S20 and ((readout display) same (magnetic adj field adj sensor))	US-PGPUB; USPAT; USOCR;	OR	ON	2015/07/17 11:19

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S23	351	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((foreign adj object) with (detect$3 sens$3 monitor$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 11:28
S24	14	S23 same (gradiometer (magnetic adj field adj (sens$3 monitor$3 detect$3)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 11:30
S25	75	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 12:39
S26	4	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) and (magnetic adj field adj gradiometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 13:15
S27	5	"2011072074".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 13:41
S28	13	"390720".ap.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 13:51
S29	2	"20120146580".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/07/17 13:57

EAST Search History (Interference)

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7/17/2015 4:00:38 PM
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UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

26161 7590 07/23/2015
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
KAPLAN, HAL IRA	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
07/23/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 13/608,956	Applicant(s) VERGHESE ET AL.	
	Examiner HAL KAPLAN	Art Unit 2836	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *September 10, 2012*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-19* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *13 and 15-17* is/are allowed.

7)☒ Claim(s) *1,11 and 14* is/are rejected.

8)☒ Claim(s) *2-10,12,18 and 19* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *9/10/12* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *See Continuation Sheet*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Continuation of Attachment(s) 2). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/5/12,8/7/13,9/2/14,4/29/15,5/8/15.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Drawings

2. The drawings were received on September 10, 2012. These drawings are accepted.

Claim Objections

3. Claims 1, 7-8, 10-11, and 18-19 are objected to because of the following informalities: Claim 1, line 4, “to measuring” should be “to measure”. Claim 7 should have a period at the end of the claim. Claim 8, line 2, “the wireless energy transfer” lacks proper antecedent basis and should be “the wireless energy transfer system”. Claim 10, line 1, “circuitry” should be “circuit”. Claim 11, line 2, “the wireless energy transfer” should be “the wireless energy transfer system”. Claim 18, line 2, “the voltage signal” lacks proper antecedent basis. Claim 19, line 2, "circuitry" should be "circuit" and "fields" should be "field". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):
> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 11 and 14 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 11 is a dependent claim, but its dependency is missing. For examination purposes, it has been assumed that claim 11 depends from claim 1, in order to provide antecedent basis for the parameters, the wireless energy transfer system, and the foreign object debris detection system.

The term "near" in claim 14 is a relative term which renders the claim indefinite. The term "near" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claim 1 is rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by the Japanese patent of Kitamura (JP2011-072074A). US patent application publication 2012/0146580 has been used as a translation of JP2011-072074A.

As to claim 1, Kitamura discloses a foreign object debris detection system for a wireless energy transfer system comprising: a magnetic field sensor (L3), and a readout circuit (10) to measure electrical parameters (e.g. change in amplitude) of the magnetic field sensor (L3), wherein the magnetic field sensor (L3) is positioned within

the magnetic field of the wireless energy transfer system (see paragraphs [0082]-[0119]) and Figures 1-9).

Allowable Subject Matter

8. Claims 13 and 15-17 allowed.

9. Claims 2-10, 12, and 18-19 are objected to as being dependent upon a rejected base claim or a base claim that has been objected to, or because of informalities, but would be allowable if rewritten with the informalities corrected.

10. Claims 11 and 14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. The following is an examiner's statement of reasons for allowance:

Claims 13 and 15-17 are allowed, and claims 14, 18, and 19 contain allowable subject matter, because none of the prior art of record discloses or suggests at least one magnetic field gradiometer positioned in the oscillating magnetic field; a readout circuit to measure electrical parameters of the field gradiometer; and a feedback loop to control the parameters of the wireless energy transfer source in response to the measured electrical parameters of the field gradiometer, in combination with the remaining claimed features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

12. The following is a statement of reasons for the indication of allowable subject matter:

Claims 2-10 and 12 contain allowable subject matter because none of the prior art of record discloses or suggests the magnetic field sensor comprising a magnetic field gradiometer, in combination with the remaining claimed features.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAL KAPLAN whose telephone number is (571)272-8587. The examiner can normally be reached on M-F 9:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford N. Barnie can be reached on 571-272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HAL KAPLAN/
Primary Examiner, Art Unit 2836

Notice of References Cited	Application/Control No. 13/608,956	Applicant(s)/Patent Under Reexamination VERGHESE ET AL.	
	Examiner HAL KAPLAN	Art Unit 2836	Page 1 of 1

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	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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BIB DATA SHEET

CONFIRMATION NO. 4270

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/608,956	09/10/2012	307	2836	25236-0036001

APPLICANTS

INVENTORS

Simon Verghese, Arlington, MA;
Morris P. Kesler, Bedford, MA;
Katherine L. Hall, Arlington, MA;
Herbert Toby Lou, Carlisle, MA;

**** CONTINUING DATA ***************************

This appln claims benefit of 61/532,785 09/09/2011

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

09/20/2012

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged /HAL IRA KAPLAN/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		MA	10	19	2

ADDRESS

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022
UNITED STATES

TITLE

FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

FILING FEE RECEIVED		
1380	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	Art Unit
	HAL KAPLAN	2836

CPC- SEARCHED		
Symbol	Date	Examiner
G01R 33/10	7/17/2015	HK
G01V 3/10	7/17/2015	HK
H02J 5/005,17/00	7/17/2015	HK
H01F 27/2804, 38/14	7/17/2015	HK

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	104		

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout	7/17/2015	HK
Inventor name/assignee search	7/17/2015	HK

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Verghese, et al.	
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Examiner Signature	Date Considered
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /HK/

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Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	First Named Inventor Simon Verghese	
	Filing Date September 10, 2012	Group Art Unit 2617

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Substitute Disclosure Form U.S. Department of Commerce Patent and Trademark Office **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b))	Attorney Docket No. 25236-0036001	Application No. 13/608,956
	First Named Inventor Simon Verghese	
	Filing Date September 10, 2012	Group Art Unit 2617

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Examiner Signature	Date Considered
/HAL KAPLAN/	07/16/2015

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Substitute Disclosure Form U.S. Department of Commerce Patent and Trademark Office **Information Disclosure Statement by Applicant** (Use several sheets if necessary) (37 CFR §1.98(b))	Attorney Docket No. 25236-0036001	Application No. 13/608,956
	First Named Inventor Simon Verghese	
	Filing Date September 10, 2012	Group Art Unit 2617

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.
[4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e) (1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e) (2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jeffrey R. Ambroziak/	Date (YYYY-MM-DD)	2013-08-07
Name/Print	Jeffrey R. Ambroziak	Registration Number	47387

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Doc description: Information Disclosure Statement (IDS) Field

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13/608,956
	Filing Date	Sep 10, 2012
	First Named Inventor	Simon Verghese
	Art Unit	2617
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	WTCY-0064-P01

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

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	39.	US-5993996A		Nov 30, 1999	Firsich, David W.	
	40.	US-5999308A		Dec 7, 1999	Nelson, Keith A., et al.	
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Attorney Docket Number	WTCY-0064-P01

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	54.	US-6535133B2		Mar 18, 2003	Gohara, Takashi	
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	Attorney Docket Number	WTCY-0064-P01

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	Art Unit	2617
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	WTCY-0064-P01

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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	WTCY-0064-P01

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	Attorney Docket Number	WTCY-0064-P01

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	Art Unit	2617
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	Art Unit	2617
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	First Named Inventor	Simon Verghese
	Art Unit	2617
	Examiner Name	Not Yet Assigned
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Attorney Docket Number	WTCY-0064-P01

Examiner Signature	/HAL KAPLAN/	Date Considered	07/16/2015

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/John A. Monocello, III/	Date (YYYY-MM-DD)	2012-12-05
Name/Print	John A. Monocello, III	Registration Number	51022

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Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit Unknown

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Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
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/HK/	A2	7,868,588	1/11/2011	Altekruse et al.			
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Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
/HK/	B1	CN 101807822	08/18/2010	China			Abstract	
/HK/	B2	DE 10 2011 015980	10/4/2012	Germany			Abstract	
/HK/	B3	FR 2 968 616	06/15/2012	France			Abstract	
/HK/	B4	EP 2 410 631	01/25/2012	EPO				
/HK/	B5	JP H6-2975	01/14/1994	Japan			X	
/HK/	B6	JP 2000-134830	5/12/2000	Japan			X	
/HK/	B7	JP 2008-17562	01/24/2008	Japan			X	

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(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit Unknown

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/HK/	B8	JP 2009-213295	09/17/2009	Japan			X	
/HK/	B9	JP 2009-273260	11/19/2009	Japan			See US 2009/0278523	
/HK/	B10	WO 00/23823	04/27/2000	WIPO				
/HK/	B11	WO 2009/081115	07/02/2009	WIPO				
/HK/	B12	WO 2010/106648	09/23/2010	WIPO			Abstract/See EP 2410631	
/HK/	B13	WO 2010/136927	12/02/2010	WIPO				

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
/HK/	C1	Copy of Australian Patent Examination Report No. 1 for Australian Application No. 2011312376 by Examiner Soosa Gnanasingham dated May 26, 2014 (3 pages)
/HK/	C2	Copy of Supplementary European Search Report for Application No. 11831382 by Examiner Matthias Holz dated January 26, 2015 (8 pages)
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	2836
Serial No.	:	13/608,956	Examiner	:	Hal Ira Kaplan
Filed	:	September 10, 2012	Conf. No.	:	4270
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO ACTION OF JULY 23, 2015

Please consider the following reply.

List of Claims (replacing prior versions):

1. (Canceled)

2. (Currently Amended) ~~The system of claim 1,~~ A foreign object debris detection system for a wireless energy transfer system, comprising:

at least one magnetic field sensor comprising ~~wherein the at least one magnetic field sensor comprises a~~ at least one magnetic field gradiometer[[.]]; and

at least one readout circuit to measure electrical parameters of the at least one magnetic field sensor,

wherein the at least one magnetic field sensor is positioned within a magnetic field of the wireless energy transfer system.

3. (Original) The system of claim 2, wherein the at least one magnetic field gradiometer comprises a figure-8 quadrupole conductor loop.

4. (Original) The system of claim 2, wherein the at least one magnetic field gradiometer comprises an octupole conductor loop.

5. (Currently Amended) The system of claim 2, wherein the at least one readout circuit has an input impedance sufficient to substantially prevent circulating currents in the at least one magnetic field gradiometer ~~loop~~.

6. (Original) The system of claim 3, wherein the figure-8 quadrupole conductor loop is printed on a circuit board.

7. (Currently Amended) The system of claim 6, wherein the figure-8 quadrupole conductor loop is rectangular.

8. (Currently Amended) The system of claim 3, wherein the system comprises an array of gradiometer loops positioned in the magnetic field of the wireless energy transfer system.

9. (Original) The system of claim 8, wherein the system comprises multiple layers of offset and overlapped gradiometer loops.

10. (Currently Amended) The system of claim 5, wherein the readout ~~circuitry~~ circuit is multiplexed among a plurality of gradiometer loops.

11. (Currently Amended) ~~The system of claim ,~~ A foreign object debris detection system for a wireless energy transfer system, comprising:

at least one magnetic field sensor;

at least one readout circuit to measure electrical parameters of the at least one magnetic field sensor; and

~~further comprising~~ a feedback loop to adjust ~~the~~ parameters of the wireless energy transfer system based on readings from the foreign object debris detection system[[.]],

wherein the at least one magnetic field sensor is positioned within a magnetic field of the wireless energy transfer system.

12. (Currently Amended) The system of claim 2, wherein the at least one magnetic field gradiometer is at least twice ~~the~~ a size of a smallest foreign object debris (FOD) to be detected.

13. (Currently Amended) A wireless energy transfer system with foreign object debris detection, the system comprising:

at least one wireless energy transfer source configured to generate an oscillating magnetic field;

at least one magnetic field gradiometer positioned in the oscillating magnetic field;

a readout circuit to measure electrical parameters of the field gradiometer; and

a feedback loop to control ~~the~~ parameters of the wireless energy transfer source in response to the measured electrical parameters of the field gradiometer.

14. (Currently Amended) The system of claim 13, further comprising at least one temperature sensor, wherein the at least one temperature sensor is positioned to measure ~~the~~ a temperature ~~near~~ associated with the wireless energy transfer source.

15. (Currently Amended) The system of claim 13, wherein a reading from the at least one magnetic field gradiometer is used to shut down the energy transfer of the at least one wireless energy transfer source.

16. (Currently Amended) The system of claim 13, wherein the system further comprises an array of magnetic field gradiometers connected to high-input-impedance readout circuitry.

17. (Currently Amended) The system of claim 16, wherein the high-input-impedance readout circuitry monitors ~~the~~ a voltage signal of the ~~gradiometer loops~~ magnetic field gradiometers.

18. (Currently Amended) The system of claim 17, wherein the high-input-impedance readout circuitry monitors ~~the~~ a phase of the voltage signal of the ~~gradiometer loops~~ magnetic field gradiometers.

19. (Currently Amended) The system of claim 18, further comprising a field sensing loop for synchronizing the readout ~~circuitry~~ circuit with a frequency of the oscillating magnetic ~~fields~~ field of the at least one wireless energy transfer source.

REMARKS

In reply to the Office Action of July 23, 2015, Applicants have canceled claim 1 and amended claims 2, 5, 7, 8, and 10-19. Accordingly, claims 2-19 are pending, with claims 2, 11, and 13 in independent form.

Claim Objections

Claims 1, 7, 8, 10, 11, 18, and 19 were objected to because of various informalities. Applicants have canceled claim 1 and amended claims 7, 8, 10, 11, 18, and 19 to correct the issues identified by the Office, and therefore request that these objections be withdrawn.

Claim Rejections – 35 USC § 112

Claims 11 and 14 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicants have amended claim 11 herein so that claim 11 is now in independent form, obviating the requirement for a dependency. Applicants have amended claim 14 to delete the word "near". Accordingly, Applicants respectfully request that the rejections of claims 11 and 14 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Claim Rejections – 35 USC § 102

Claim 1 stand rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by Kitamura (JP 2011-072074A). Without conceding that this rejection is correct, but merely to expedite prosecution, Applicants have canceled claim 1, and therefore respectfully request that this rejection be withdrawn.

Allowable Subject Matter

Applicants thank the Office for indicating that claims 13 and 15-17 are allowed, that claims 2-10, 12, 18, and 19 would be allowable if rewritten in independent form with informalities corrected, and that claims 11 and 14 would be allowable if rewritten to overcome the rejections under 35 U.S.C. § 112, second paragraph.

Applicants have rewritten claim 2 in independent form. Claims 3-10 and 12 depend from claim 2. Applicants have also rewritten claim 11 in independent form. As explained above, the claims have been amended to correct informalities and to overcome the rejections under 35 U.S.C. § 112, second paragraph. Applicants therefore submit that claims 2-19 are in condition for allowance.

Conclusion

In view of the foregoing, Applicants ask that the application be allowed.

Canceled claims, if any, have been canceled without prejudice or disclaimer. Any circumstance in which Applicants have: (a) addressed certain comments of the Office does not mean that Applicants concede other comments of the Office; (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims; or (c) amended or canceled a claim does not mean that Applicants concede any of the Office's positions with respect to that claim or other claims.

Applicants respectfully request consideration of all filed IDSs not previously considered, by initialing and returning each Form PTO-1449.

No fees are believed to be due. Please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above Attorney Docket Number 25236-0036001.

Respectfully submitted,

Date: October 23, 2015

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
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Electronic Acknowledgement Receipt

EFS ID:	23871737
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	25236-0036001
Receipt Date:	23-OCT-2015
Filing Date:	10-SEP-2012
Time Stamp:	11:05:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		ReplytoOA.pdf	72316 9cde15351a722f9db10b022098f4190cf60bd986	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	6
Warnings:			
Information:			
	Total Files Size (in bytes):	72316	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/608,956	09/10/2012	

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **10/23/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/DORRETTA BROOKS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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UNITED STATES DEPARTMENT OF COMMERCE
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NOTICE OF ALLOWANCE AND FEE(S) DUE

26161 7590 12/22/2015
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER
KAPLAN, HAL IRA

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 12/22/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

TITLE OF INVENTION: FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	03/22/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26161 7590 12/22/2015
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

TITLE OF INVENTION: FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

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nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	03/22/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
KAPLAN, HAL IRA	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

26161 7590 12/22/2015
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
KAPLAN, HAL IRA	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 12/22/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/608,956	Applicant(s) VERGHESE ET AL.	
	Examiner HAL KAPLAN	Art Unit 2836	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Applicants' amendments dated October 23, 2015*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *2-19*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

2. Claims 2-19 allowed.

3. The following is an examiner's statement of reasons for allowance:

Claims 2-10 and 12 are allowed because none of the prior art of record discloses or suggests the magnetic field sensor comprising a magnetic field gradiometer, in combination with the remaining claimed features.

Claim 11 is allowed none of the prior art of record discloses or suggests at least one readout circuit to measure electrical parameters of the at least one magnetic field sensor, and a feedback loop to adjust parameters of the wireless energy transfer system based on readings from the foreign object debris detection system, in combination with the remaining claimed features.

Claims 13-19 are allowed because none of the prior art of record discloses or suggests at least one magnetic field gradiometer positioned in the oscillating magnetic field; a readout circuit to measure electrical parameters of the field gradiometer; and a feedback loop to control the parameters of the wireless energy transfer source in response to the measured electrical parameters of the field gradiometer, in combination with the remaining claimed features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

4. Applicant's arguments, see Remarks, filed October 23, 2015, with respect to the objections to the claims and the rejections of claims 1, 11, and 14 under 35 U.S.C. 112 (pre-AIA), second paragraph and 102(a) have been fully considered and are persuasive. The objections and rejections of claims 1, 11, and 14 have been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAL KAPLAN whose telephone number is (571)272-8587. The examiner can normally be reached on M-F 9:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford N. Barnie can be reached on 571-272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HAL KAPLAN/
Primary Examiner, Art Unit 2836

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	**Art Unit**
	HAL KAPLAN	2836

CPC						
Symbol					**Type**	**Version**
G01R		33	/	10	F	2013-01-01
H02J		17	/	00	I	2013-01-01
G01V		3	/	10	I	2013-01-01
H02J		5	/	005	A	2013-01-01
H01F		27	/	2804	A	2013-01-01
H01F		38	/	14	A	2013-01-01
B60L		11	/	182	I	2013-01-01
			/			
			/			
			/			
			/			
			/			
			/			
			/			
			/			

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	18	
/HAL KAPLAN/ Primary Examiner.Art Unit 2836	12/16/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	**Art Unit**
	HAL KAPLAN	2836

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
307	104

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

INTERNATIONAL CLASSIFICATION														
CLAIMED						**NON-CLAIMED**								
G	0	1	R	33 / 10 (2006.01.01)										
G	0	1	V	3 / 10 (2006.01.01)										
H	0	2	J	17 / 00 (2006.01.01)										
H	0	1	F	38 / 14 (2006.01.01)										
H	0	1	F	27 / 42 (2006.01.01)										

NONE	**Total Claims Allowed:**	
(Assistant Examiner) (Date)	18	
/HAL KAPLAN/ Primary Examiner.Art Unit 2836 12/16/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner) (Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	**Art Unit**
	HAL KAPLAN	2836

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	16	17												
1	2	17	18												
2	3	18	19												
7	4														
8	5														
3	6														
4	7														
5	8														
6	9														
9	10														
11	11														
10	12														
12	13														
13	14														
14	15														
15	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/HAL KAPLAN/ Primary Examiner.Art Unit 2836 (Primary Examiner)	12/16/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	Art Unit
	HAL KAPLAN	2836

CPC- SEARCHED

Symbol	Date	Examiner
G01R 33/10	7/17/2015	HK
G01V 3/10	7/17/2015	HK
H02J 5/005,17/00	7/17/2015	HK
H01F 27/2804, 38/14	7/17/2015	HK

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
307	104		

SEARCH NOTES

Search Notes	Date	Examiner
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout	7/17/2015	HK
Inventor name/assignee search	7/17/2015	HK
G01R 33/10 (updated search)	10/15/2015	HK
G01V 3/10 (updated search)	10/15/2015	HK
H02J 5/115, 17/00 (updated search)	10/15/2015	HK
H01F 27/2804, 38/14 (updated search)	10/15/2015	HK
307/104 (updated search)	10/15/2015	HK
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout (updated search)	10/15/2015	HK
Inventor name/assignee search (updated)	10/15/2015	HK
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout (updated search)	10/16/2015	HK
IEEE Xplore (see printout)	10/16/2015	HK

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
INSPEC (see printout)	10/16/2015	HK
Ei Compendex (see printout)	10/16/2015	HK

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
307	104	10/16/2015	HK
G01R	33/10	10/16/2015	HK
G01V	3/10	10/16/2015	HK
H02J	5/005, 17/00	10/16/2015	HK
H01F	27/2804, 38/14	10/16/2015	HK

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) near2 (sens$3 detect$3 monitor$3 measur$3)) same ((magnetic adj field) near2 gradiometer) same (feedback feed-back (fed adj back)) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:10
L2	8	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) adj (sens$3 detect$3 monitor$3 measur$3)) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:15
L3	4	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:24
L4	3	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) same (readout display) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:25
L5	3	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) same ((readout display) same (magnetic adj field adj sensor)) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:26
L6	59	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((foreign adj object) with (detect$3 sens$3 monitor$3)) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:27
L7	2	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((foreign adj object) with (detect$3 sens$3 monitor$3)) same (gradiometer (magnetic adj field adj (sens$3 monitor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 11:31

		detect$3))) and @pd>="20150717"				
L8	4	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 12:45
L9	52	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) and (magnetic adj field adj sensor) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 12:47
L11	741	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) same (foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 12:58
L12	2732	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 12:58
L14	33	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) same (foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3)) same ((magnetic adj field) with (sens$3 monitor$3 detect$3 measur$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 13:03
L15	37	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3))) same ((magnetic adj field) with (sens$3 monitor$3 detect$3 measur$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 13:03
L16	37	14 or 15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 13:05
L17	364	(11 or 12) and ((magnetic adj field) with (sens$3 monitor$3 detect$3 measur$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 13:16
L24	107	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2015/12/16 15:08

		measur$3))) and ((magnetic adj field) adj (sens$3 monitor$3 detect$3 measur$3)))	JPO; DERWENT; IBM_TDB			
L25	15	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3)) and gradiometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/16 15:14
S31	4	verghese-simon.in. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 16:44
S32	17	kesler-morris-p.in. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 16:55
S33	13	hall-katherine-l.in. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:10
S34	3	lou-herbert-toby.in. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:12
S35	24	witricity.as. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:12
S36	616	307/104.ccls. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:14
S37	25	g01r33/10.cpc. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:15
S38	91	g01v3/10.cpc. and @pd>="20150717"	US-PGPUB; USPAT;	OR	ON	2015/12/15 17:17

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S39	1072	h02j17/00.cpc. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:18
S40	1539	h02j5/005.cpc. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:20
S41	272	h01f27/2804.cpc. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:21
S42	733	h01f38/14.cpc. and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:21
S43	2681	S36 or S37 or S38 or S39 or S40 or S41 or S42	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:22
S44	35	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) near2 (sens$3 detect$3 monitor$3 measur$3)) and @pd>="20150717"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/12/15 17:23

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L18	17	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3))).clm.	US-PGPUB; USPAT	OR	ON	2015/12/16 14:35
L19	1	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3	US-PGPUB; USPAT	OR	ON	2015/12/16 14:41

		sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3)) and gradiometer).clm.				
L20	11	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3))).clm. and (307/104.ccls. (g01r33/10 g01v3/10 h02j5/005 h02j17/00 h01f27/2804 h01f38/14).cpc.)	US-PGPUB; USPAT	OR	ON	2015/12/16 14:48
L21	2	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3)) and (feedback feed-back (fed adj back))).clm.	US-PGPUB; USPAT	OR	ON	2015/12/16 14:59
L22	1	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) adj (sens$3 monitor$3 detect$3 measur$3)) and (feedback feed-back (fed adj back))).clm.	US-PGPUB; USPAT	OR	ON	2015/12/16 15:00
L23	3	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) adj (sens$3 monitor$3 detect$3 measur$3))).clm.	US-PGPUB; USPAT	OR	ON	2015/12/16 15:01

12/ 16/ 2015 3:24:53 PM
C:\ Users\ hkaplan\ Documents\ EAST\ Workspaces\ 13608956.wsp

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FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Courtesy Reminder for
Application Serial No: 13/608,956

Attorney Docket No: 25236-0036001
Customer Number: 26161
Date of Electronic Notification: 12/22/2015

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:
PATDOCTC@fr.com

To view your correspondence online or update your email addresses, please visit us anytime at **https://sportal.uspto.gov/secure/myportal/privatepair.** If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	2011/0025265	2/3/2011	Mochida et al.			
	2.	2012/0181875	7/19/2012	Wechlin et al.			
	3.	2012/0187757	7/26/2012	Wechlin et al.			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	4.	CN 101983466	3/2/2011	China	H02J	7/00	See US 2011/0025265	
	5.	DE 10 2009 033 236	1/20/2011	Germany	G01V	3/08	See US 2012/0187757	
	6.	DE 10 2009 033 237	1/20/2011	Germany	G01V	3/11	See US 2012/0181875	

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	7.	Copy of Chinese Office Action for Chinese Application No. 2012800496010 dated December 21, 2015 (5 pages)
	8.	Copy of EP Search Report for EP Application No. 15 19 0252 by Examiner A. Tchegho Kamdem dated January 4, 2016 (11 pages)

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Electronic Patent Application Fee Transmittal

Application Number:	13608956
Filing Date:	10-Sep-2012
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Filer:	Marc M. Wefers/Cheryl Forrest
Attorney Docket Number:	25236-0036001

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	24580114
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Marc M. Wefers/Cheryl Forrest
Filer Authorized By:	Marc M. Wefers
Attorney Docket Number:	25236-0036001
Receipt Date:	11-JAN-2016
Filing Date:	10-SEP-2012
Time Stamp:	09:22:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	9264
Deposit Account	061050
Authorized User	FISH & RICHARDSON P C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS.pdf	140373 e936d2ee58392582c9dcac3e8a902a449f43dbce	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
2	Foreign Reference	FA4.pdf	1243442 95a3d6570f7927c98b71b46d26dd2ac7d71afdcf	no	23
Warnings:					
Information:					
3	Foreign Reference	FA5.pdf	704397 8bb4e6352fb199388e7d02d173479132d3d3999b	no	11
Warnings:					
Information:					
4	Foreign Reference	FA6.pdf	642747 8ff862de2f13122831e2a8912b454546b5cf5f56	no	10
Warnings:					
Information:					
5	Non Patent Literature	NPL7.pdf	202365 bc17524685424a105f4328c56b3524e7bea25141	no	5
Warnings:					
Information:					
6	Non Patent Literature	NPL8.pdf	487940 23bcf697bc3ea269304741357b656c8583e2cf42	no	11
Warnings:					
Information:					

7	Fee Worksheet (SB06)	fee-info.pdf	30753 ef7f828d405a44c9a99f8edeac58ff4f07e195d9	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	3452017

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	2836
Serial No.	:	13/608,956	Examiner	:	Hal Ira Kaplan
Filed	:	September 10, 2012	Conf. No.	:	4270
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-SB-08 or Disclosure Form. Foreign patent documents and non-patent literature are enclosed; cited U.S. patents and patent application publications will be provided on request. A copy of a communication from a foreign patent office in a counterpart application is also enclosed.

This statement is being filed after a final action or a notice of allowance, but before payment of the issue fee. Each item of information in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this information disclosure statement. See 37 CFR 1.97(e)(1). A late submission fee in the amount of $180, specified by 37 CFR §1.17(p) is being paid with this statement.

Apply any necessary charges or credits to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: January 11, 2016

/Marc M. Wefers Reg. No. 56,842/
Marc M. Wefers
Reg. No. 56,842

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

26161 7590 01/25/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
KAPLAN, HAL IRA	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
01/25/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address : COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/608,956	10 September, 2012	VERGHESE ET AL.	25236-0036001

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
HAL KAPLAN	
ART UNIT	PAPER
2836	20160119

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

The IDS dated January 11, 2016 has been considered.

/HAL KAPLAN/
Primary Examiner, Art Unit 2836

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2836

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
/H.K./	1.	2011/0025265	2/3/2011	Mochida et al.			
/H.K./	2.	2012/0181875	7/19/2012	Wechlin et al.			
/H.K./	3.	2012/0187757	7/26/2012	Wechlin et al.			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
/H.K./	4.	CN 101983466	3/2/2011	China	H02J	7/00	See US 2011/0025265	
/H.K./	5.	DE 10 2009 033 236	1/20/2011	Germany	G01V	3/08	See US 2012/0187757	
/H.K./	6.	DE 10 2009 033 237	1/20/2011	Germany	G01V	3/11	See US 2012/0181875	

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
/H.K./	7.	Copy of Chinese Office Action for Chinese Application No. 2012800496010 dated December 21, 2015 (5 pages)
/H.K./	8.	Copy of EP Search Report for EP Application No. 15 19 0252 by Examiner A. Tchegho Kamdem dated January 4, 2016 (11 pages)

Examiner Signature	Date Considered
/Hal Kaplan/	01/19/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PTO/SB/30 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995. no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	13/608,956
Filing Date	September 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Hal Ira Kaplan
Attorney Docket Number	25236-0036001

This is a Request for Continued Examination (RCE) under 37 CFR 1 .114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☒ Enclosed

      i. ☐ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☒ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

   a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   The Director is hereby authorized to charge the following fees any underpayment of fees or credit any overpayments to

   a. ☒ Deposit Account No. 06-1050 .

      i. ☒ RCE fee required under 37 CFR 1.17(e)

      ii ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii ☒ Other any deficiencies

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Peter R. Poulin Reg. No. 74,643/	Date	March 22, 2016
Name (Print/Type)	Peter R. Poulin	Registration No.	74,643

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

American LegalNet, Inc.
www.FormsWorkFlow.com

Electronic Patent Application Fee Transmittal

Application Number:	13608956
Filing Date:	10-Sep-2012
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Filer:	Peter Poulin/Cheryl Forrest
Attorney Docket Number:	25236-0036001

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
		Total in USD ($)		**1200**

Electronic Acknowledgement Receipt

EFS ID:	25269699
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Peter Poulin/Cheryl Forrest
Filer Authorized By:	Peter Poulin
Attorney Docket Number:	25236-0036001
Receipt Date:	22-MAR-2016
Filing Date:	10-SEP-2012
Time Stamp:	14:46:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1200
RAM confirmation Number	1061
Deposit Account	061050
Authorized User	FISH & RICHARDSON P C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS.pdf	138042 45099c16ae73a2d1525fdd9fe70eb163a7969418	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
2	Foreign Reference	FA2.pdf	719492 bcd7441977f941215d03b8f6631a2fcd08c7bea7	no	12
Warnings:					
Information:					
3	Foreign Reference	FA3.pdf	1502108 8c460eccb8a3f1bfaaf9c55783ae00cb7534db3b	no	32
Warnings:					
Information:					
4	Request for Continued Examination (RCE)	RCE.pdf	108808 40ccbef58eb16b9706b3f1adc6989a3c9df346ac	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
5	Non Patent Literature	NPL4.pdf	727150 55d0c9985b392b6a9fca3994ff1041da23db1149	no	5
Warnings:					
Information:					
6	Non Patent Literature	NPL5.pdf	1926327 ce860c4a4c470f154e3fe6f56b23211afafa83fe	no	13
Warnings:					

Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	30728 d2fdaf05687a8b892ab9fcc97ee77bea847179c3	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	5152655	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	2836
Serial No.	:	13/608,956	Examiner	:	Hal Ira Kaplan
Filed	:	September 10, 2012	Conf. No.	:	4270
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

MAIL STOP RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-1449 Form. Copies of foreign patent documents and non-patent literature are enclosed; copies of cited U.S. patents and patent application publications will be provided upon request.

This filing is being made with the filing of a Request for Continued Examination. No fee is required. Please apply any necessary charges or credits to deposit account 06-1050, referencing the above Attorney Docket Number 25236-0036001.

Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: March 22, 2016

/Peter R. Poulin Reg. No. 74,643/
Peter R. Poulin
Reg. No. 74,643

Customer Number 26161
Fish & Richardson P.C.
Telephone: 6175425070
Facsimile: (877) 769-7945

23504423.doc

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.	2007/0228833	10/4/2007	Stevens et al.			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	2.	JP H07-225251	8/22/1995	Japan	G01R	29/08	English Abstract Only	
	3.	JP 2008-295231	12/4/2008	Japan	H02J	17/00	See US 2008/0290736 Previously Cited	

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	4.	Copy of Communication from the European Patent Office for Application No. 11 831 382.4 by Examiner Matthias Holz dated February 1, 2016 (5 pages)
	5.	Copy of Korean Office Action for Korean Application No. 10-2013-7009960 dated March 7, 2016 (13 pages)

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26161 7590 04/28/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER
KAPLAN, HAL IRA

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 04/28/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

TITLE OF INVENTION: FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	07/28/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26161 7590 04/28/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

TITLE OF INVENTION: FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	07/28/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
KAPLAN, HAL IRA	2836	307-104000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

26161 7590 04/28/2016
FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
KAPLAN, HAL IRA	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 04/28/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/608,956	Applicant(s) VERGHESE ET AL.	
	Examiner HAL KAPLAN	Art Unit 2836	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Applicant's RCE dated March 22, 2016*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *2-19*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/22/16
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/HAL KAPLAN/
Primary Examiner, Art Unit 2836

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on March 22, 2016 has been entered.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on March 22, 2016 was filed after the mailing date of the Notice of Allowance on December 22, 2015. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Allowable Subject Matter

1. Claims 2-19 allowed.

2. The following is an examiner's statement of reasons for allowance:

Claims 2-10 and 12 are allowed because none of the prior art of record discloses or suggests the magnetic field sensor comprising a magnetic field gradiometer, in combination with the remaining claimed features.

Claim 11 is allowed none of the prior art of record discloses or suggests at least one readout circuit to measure electrical parameters of the at least one magnetic field sensor, and a feedback loop to adjust parameters of the wireless energy transfer system based on readings from the foreign object debris detection system, in combination with the remaining claimed features.

Claims 13-19 are allowed because none of the prior art of record discloses or suggests at least one magnetic field gradiometer positioned in the oscillating magnetic field; a readout circuit to measure electrical parameters of the field gradiometer; and a feedback loop to control the parameters of the wireless energy transfer source in response to the measured electrical parameters of the field gradiometer, in combination with the remaining claimed features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAL KAPLAN whose telephone number is (571)272-8587. The examiner can normally be reached on M-F 9:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford N. Barnie can be reached on 571-272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HAL KAPLAN/
Primary Examiner, Art Unit 2836

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
13608956	VERGHESE ET AL.
Examiner	**Art Unit**
HAL KAPLAN	2836

CPC						
Symbol					**Type**	**Version**
G01R		33	/	10	F	2013-01-01
H02J		17	/	00	I	2013-01-01
G01V		3	/	10	I	2013-01-01
H02J		5	/	005	A	2013-01-01
H01F		27	/	2804	A	2013-01-01
H01F		38	/	14	A	2013-01-01
B60L		11	/	182	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/HAL KAPLAN/ Primary Examiner.Art Unit 2836 (Primary Examiner)	4/18/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	**Art Unit**
	HAL KAPLAN	2836

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
307	104

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

INTERNATIONAL CLASSIFICATION														
CLAIMED						**NON-CLAIMED**								
G	0	1	R	33 / 10 (2006.01.01)										
G	0	1	V	3 / 10 (2006.01.01)										
H	0	2	J	17 / 00 (2006.01.01)										
H	0	1	F	38 / 14 (2006.01.01)										
H	0	1	F	27 / 42 (2006.01.01)										

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/HAL KAPLAN/ Primary Examiner.Art Unit 2836 (Primary Examiner)	4/18/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	**Art Unit**
	HAL KAPLAN	2836

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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10	12														
12	13														
13	14														
14	15														
15	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/HAL KAPLAN/ Primary Examiner.Art Unit 2836 (Primary Examiner)	4/18/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13608956	VERGHESE ET AL.
	Examiner	Art Unit
	HAL KAPLAN	2836

CPC- SEARCHED		
Symbol	Date	Examiner
G01R 33/10	7/17/2015	HK
G01V 3/10	7/17/2015	HK
H02J 5/005,17/00	7/17/2015	HK
H01F 27/2804, 38/14	7/17/2015	HK

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	104		

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout	7/17/2015	HK
Inventor name/assignee search	7/17/2015	HK
G01R 33/10 (updated search)	12/15/2015	HK
G01V 3/10 (updated search)	12/15/2015	HK
H01F 27/2804, 38/14 (updated search)	12/15/2015	HK
307/104 (updated search)	12/15/2015	HK
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout (updated search)	12/15/2015	HK
Inventor name/assignee search (updated)	12/15/2015	HK
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout (updated search)	12/16/2015	HK
IEEE Xplore (see printout)	12/16/2015	HK
INSPEC (see printout)	12/16/2015	HK

SEARCH NOTES

Search Notes	Date	Examiner
Ei Compendex (see printout)	12/16/2015	HK
G01R 33/10 (updated search)	4/18/2016	HK
G01V 3/10 (updated search)	4/18/2016	HK
H01F 27/2804, 38/14 (updated search)	4/18/2016	HK
307/104 (updated search)	4/18/2016	HK
EAST (US-PGPUB,USPAT,USOCR,FPRS,EPO,JPO,DERWENT,IBM_TDB) - See Search History Printout (updated search)	4/18/2016	HK
Inventor name/assignee search (updated)	4/18/2016	HK
IEEE Xplore (updated)	4/18/2016	HK
INSPEC (updated)	4/18/2016	HK
Ei Compendex (updated)	4/18/2016	HK

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
307	104	10/16/2015	HK
G01R	33/10	10/16/2015	HK
G01V	3/10	10/16/2015	HK
H02J	5/005, 17/00	10/16/2015	HK
H01F	27/2804, 38/14	10/16/2015	HK
307	104	4/18/2016	HK
G01R	33/10	4/18/2016	HK
G01V	3/10	4/18/2016	HK
H02J	5/005, 17/00	4/18/2016	HK
H01F	27/2804, 38/14	4/18/2016	HK

All databases

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(wireless or contactless and power and magnetic and field and gradiometer)

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1 Multiple-element receiving valves

Rowe, G.C.B.. **Radio News**Inspec.

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

2 Electrostatic field of a triode

Elias, G.J.; Van der Pol, B., Jr.; Teilegen, B.D.H.. **Tijdschrift van het Nederlandsch Radiogenootschap**Inspec.

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

3 Applications of the coherer

Brown, A.C.. **The Electrician** 40: 91-93. Inspec. (1897)

... be summarised as: - (1) Wireless telegraphy over moderate distances; ship ...

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

4 Wireless telegraphy

Schluckebier. **Archiv fur Post und Telegraphie** 7: 208-214, 240-246. Inspec. (1898)

... greater than those for which wireless telegraphy is practicable across free ...

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

5 Wireless telegraphy and electromagnetic waves

Riccia, D.. **Bulletin de l'Association des Ingenieurs-Electriciens, Liege** 9: 95-155. Inspec.

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

6 Wireless telegraphy

Turpain, A.. **Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences** 1 1208-1210. Inspec. (1898)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

7 Syntonised vibrators for wireless telegraphy

Electrical Review 43: 260-263. Inspec. (1898)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

8 Wireless telegraphy

Houston, E.J.; Kennelly, A.E.. **Electrical World** 31: 17-18. Inspec. (1898)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

9 Oscillatory currents

Northrup, E.F.. **Electrical World** 31: 674-676, 710-711. Inspec. (1898)

... application to a system of wireless telegraphy tried by the author ...

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

10 "Antennæ" in wireless telegraphy

Blondel, A.. **L'Eclairage Electrique** 16: 316, 318. Inspec. (1898)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

11 Hertz waves and wireless telegraphy

Murani, O.. **L'Elettricita** 17: 231-234, 245-247. Inspec. (1898)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

12 Wireless telegraphy in the French Navy

Tissot. **Bulletin de la Societe Francaise de Physique** 130: 2. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

13 Electrolytic contact breaker

d'Arsonval. **Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences** 1 529-532. Inspec. (1899)

... may also be obtained, and wireless telegraphy is thereby greatly facilitated. ...

Found in: Inspec® (1898 - current)

14 Wireless telegraphy at high altitudes

Lecarme, J.L.. **Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences** 589-591. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

15 Absorption of electric waves

Branly, E.; le Bon, G.. **Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences** 128: 879-882. Inspec. (1899)

... in the practical work of wireless telegraphy. They operated with hollow ...

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

16 Magnetic decoherer

Tommasina, T.. **Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences** 128: 1225-1226. Inspec. (1899)

... has applied this discovery to wireless telegraphy, by substituting an electromagnet ...

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

17 Simultaneous telegraph and telephone and duplexing

Lockwood, T.D.. **Electrical Review** 35: 216-218. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

18 Tall wires in wireless telegraphy

Kennedy, R.. **Electrical Review** 44: 583-584. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

19 Wireless telegraph repeater

Electrical Review 45: 749-750. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

20 Electrical radiation

Taylor, J.E.. **Electrical Review** 44: 794-795, 799-800. Inspec. (1899)

... as regards their application to wireless telegraphy, are here summed up ...

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

21 Wireless telegraphy without a coherer

Electrical Review 45: 1026-1027. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

22

Wireless telegraphy

Bissing, W.. **Electrical World** 33: 55-57, 83-86, 110-111. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

23

Wireless telegraphy

Broca, A.. **Revue Scientifique** 11: 193-199. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

24

Wireless telegraph patents

The Electrician 43: 847-850. Inspec. (1899)

Found in: Inspec® (1898 - current)

Brief citation Citation/Abstract Find a copy

25

Wireless telegraphy [with discussion]

Fessenden, R.A.. **Transactions of the American Institute of Electrical Engineers** 16: 635-6
Inspec. (1899)

... traversed in the development of wireless telegraphy. New results were confined ...

Found in: Inspec® (1898 - current)

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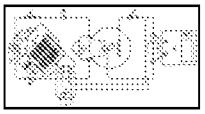
26

Wireless telegraphy [with discussion]

Marconi, G.. **Journal of the Institution of Electrical Engineers** 28.139: 273-297. Inspec. (Fe
1899)

Found in: Inspec® (1898 - current)

Images (1)



Brief citation Full text + graphics

27

Electrical radiation

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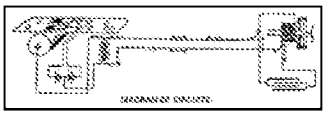
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L2	32	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) and (magnetic adj field adj sensor) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:17
L3	82	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) same (foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:33
L4	204	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3))) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:37
L5	6	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) same (foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3)) same ((magnetic adj field) with (sens$3 monitor$4 detect$3 measur$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:42
L6	6	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) same (detect$3 sens$3 monitor$3 measur$3))) same ((magnetic adj field) with (sens$3 monitor$4 detect$3 measur$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:43
L7	6	(5 or 6)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:44

L8	204	3 or 4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:45
L9	34	8 and ((magnetic adj field) with (sens$3 monitor$3 detect$3 measur$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:46
L10	43	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) with (sens$3 monitor$4 detect$3 measur$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:48
L11	2	(((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) with (sens$3 monitor$4 detect$3 measur$3)) and gradiometer) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:50
L12	1	verghese-simon.in. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:51
L13	10	kesler-morris-p.in. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:52
L14	6	hall-katherine-l.in. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:56
L15	0	lou-herbert-toby.in. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:57
L16	10	witricity.as. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2016/04/18 13:57

			EPO; JPO; DERWENT; IBM_TDB			
L17	582	307/104.ccls. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:59
L18	22	g01r33/10.cpc. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:01
L19	51	g01v3/10.cpc. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:02
L20	814	h02j17/00.cpc. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:04
L21	1146	h02j5/005.cpc. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:06
L22	281	h01f27/2804.cpc. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:07
L23	555	h01f38/14.cpc. and @pd>="20151215"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:08
L24	2069	(17 or 18 or 19 or 20 or 21 or 22 or 23)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 14:08
L25	27	((wireless contactless non-contact no-contact (non adj contact) (no adj	US-PGPUB; USPAT;	OR	ON	2016/04/18 14:10

		contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) near2 (sens$3 detect$3 monitor$3 measur$3)) and @pd>="20151215"	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S135	2	"20070228833".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 11:01
S136	0	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) near2 (sens$3 detect$3 monitor$3 measur$3)) same ((magnetic adj field) near2 gradiometer) same (feedback feed-back (fed adj back)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 11:20
S137	16	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((magnetic adj field) adj (sens$3 detect$3 monitor$3 measur$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 11:22
S138	4	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 12:12
S139	0	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) same (readout display) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 12:14
S140	0	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same (magnetic adj field adj sensor) same ((readout display) same (magnetic adj field adj sensor)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 12:16
S141	44	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((foreign adj object) with (detect$3 sens$3 monitor$3)) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 12:17
S142	0	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((foreign adj object) with (detect$3 sens$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2016/04/18 12:29

		monitor$3)) same (gradiometer (magnetic adj field adj (sens$3 monitor$3 detect$3))) and @pd>="20151216"	DERWENT; IBM_TDB			
S143	0	((wireless contactless non-contact no-contact (non adj contact) (no adj contact)) with (power energy) with (transfer$4 transmi$5)) same ((foreign adj object) with (detect$3 sens$3 monitor$3)) same (magnetic adj field adj sensor) and @pd>="20151216"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/18 13:03

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Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L26	2	(((wireless contactless non-contact non-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3))).clm. and @pd>="20151216"	US-PGPUB; USPAT	OR	ON	2016/04/18 14:12
L27	0	(((wireless contactless non-contact non-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3)) and gradiometer).clm. and @pd>="20151216"	US-PGPUB; USPAT	OR	ON	2016/04/18 14:13
L28	2	(((wireless contactless non-contact non-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3))).clm. and (307/104.ccls. (g01r33/10 g01v3/10 h02j5/005 h02j17/00 h01f27/2804 h01f38/14).cpc.) and @pd>="20151216"	US-PGPUB; USPAT	OR	ON	2016/04/18 14:16
L29	2	(((wireless contactless non-contact non-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) and (sens$3 monitor$3 detect$3 measur$3)) and (feedback feed-back (fed adj back))).clm.	US-PGPUB; USPAT	OR	ON	2016/04/18 14:17
L30	1	(((wireless contactless non-contact non-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) adj (sens$3 monitor$3 detect$3 measur$3)) and (feedback feed-back (fed adj back))).clm.	US-PGPUB; USPAT	OR	ON	2016/04/18 14:22
L31	3	(((wireless contactless non-contact non-contact (non adj contact) (no adj contact)) and ((foreign near2 (object debris)) and (detect$3 sens$3 monitor$3 measur$3))) and ((magnetic adj field) adj (sens$3 monitor$3 detect$3 measur$3))).clm.	US-PGPUB; USPAT	OR	ON	2016/04/18 14:23

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Year

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1933 2016

From: 1933 To: 2016

Author

Affiliation

Publication Title

Publisher

Conference Location

Standard Status

Standard Type

1. **A Study on Magnetic Field Repeater in Wireless Power Transfer**
   D. Ahn; S. Hong
   IEEE Transactions on Industrial Electronics
   Year: 2013, Volume: 60, Issue: 1
   Pages: 360 - 371, DOI: 10.1109/TIE.2012.2188254
   Cited by: Papers (40)
   IEEE Journals & Magazines
   Abstract (1191 Kb)

2. **Novel Method for Selective Nonlinear Flux Guide Switching for Contactless Inductive Power Transfer**
   A. E. Umenei; J. Schwannecke; S. Veipula; D. Baarman
   IEEE Transactions on Magnetics
   Year: 2012, Volume: 48, Issue: 7
   Pages: 2192 - 2195, DOI: 10.1109/TMAG.2012.2185246
   Cited by: Papers (6)
   IEEE Journals & Magazines
   Abstract (935 Kb)

3. **Through-Hole Contactless Slipring System Based on Rotating Magnetic Field for Rotary Applications**
   A. Abdolkhani; A. P. Hu; G. A. Covic; M. Moridnejad
   IEEE Transactions on Industry Applications
   Year: 2014, Volume: 50, Issue: 6
   Pages: 3644 - 3655, DOI: 10.1109/TIA.2014.2312996
   Cited by: Papers (1)
   IEEE Journals & Magazines
   Abstract (1830 Kb)

4. **Wireless Nonradiative Energy Transfer: Antenna performance enhancement techniques.**
   A. A. Eteng; S. K. A. Rahim; C. Y. Leow
   IEEE Antennas and Propagation Magazine
   Year: 2015, Volume: 57, Issue: 3
   Pages: 16 - 22, DOI: 10.1109/MAP.2015.2437281
   Cited by: Papers (1)
   IEEE Journals & Magazines
   Abstract (5297 Kb)

5. **Wireless Sensing System-on-Chip for Near-Field Monitoring of Analog and Switch Quantities**
   D. Li; M. Shen; J. Huangfu; J. Long; Y. Tao; J. Wang; C. Li; L. Ran

Standard's Dictionary Terms

far-field region
iec
cw
db
iso
rf
ansi
transverse
electromagnetic (tem)
cell
p
tem
ite

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A Double Stator Through-hole Type Contactless Slipring for Rotary Wireless Power Transfer Applications
A. Abdolkhani; A. P. Hu; N. K. C. Nair
IEEE Transactions on Energy Conversion
Year: 2014, Volume: 29, Issue: 2
Pages: 426 - 434, DOI: 10.1109/TEC.2014.2298513
IEEE Journals & Magazines

Abstract (857 Kb)

A magnetic field-based appliance metering system
N. Rajagopal; S. Giri; M. Berges; A. Rowe
Cyber-Physical Systems (ICCPS), 2013 ACM/IEEE International Conference on
Year: 2013
Pages: 229 - 238, DOI: 10.1145/2502524.2502555
IEEE Conference Publications

Abstract (4318 Kb)

Demo abstract: A magnetic field-based appliance metering system
N. Rajagopal; S. Giri; M. Berges; A. Rowe
Information Processing in Sensor Networks (IPSN), 2013 ACM/IEEE International Conference on
Year: 2013
Pages: 307 - 308, DOI: 10.1109/IPSN.2013.6917557
IEEE Conference Publications

Abstract (3474 Kb)

Exposure assessment of stray electromagnetic fields generated by a wireless power transfer system
R. Pinto; M. Bertoluzzo; V. Lopresto; S. Mancini; C. Merla; G. Pede; A. Genovese; G. Buja
2015 9th European Conference on Antennas and Propagation (EuCAP)
Year: 2015
Pages: 1 - 4
IEEE Conference Publications

Abstract (579 Kb)

First-order SQUID gradiometer with electronic subtraction for magnetocardiography
R. M. Carmina; B. Octavian
Electrical and Power Engineering (EPE), 2012 International Conference and Exposition on
Year: 2012
Pages: 577 - 580, DOI: 10.1109/ICEPE.2012.6463873
IEEE Conference Publications

Abstract (298 Kb)

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Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25236-0036001	Application No. 13/608,956
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Verghese, et al.	
(37 CFR §1.98(b))		Filing Date September 10, 2012	Group Art Unit 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	3.	Copy of Australian Patent Examination Report No. 1 by Examiner N. Ahmed Surobhi for Australian Patent Application No. 2012305688, dated May 11, 2016 (3 pages).

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Electronic Patent Application Fee Transmittal

Application Number:	13608956
Filing Date:	10-Sep-2012
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Filer:	Peter Poulin/Cheryl Forrest
Attorney Docket Number:	25236-0036001

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	26479240
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Peter Poulin/Cheryl Forrest
Filer Authorized By:	Peter Poulin
Attorney Docket Number:	25236-0036001
Receipt Date:	28-JUL-2016
Filing Date:	10-SEP-2012
Time Stamp:	11:12:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$180
RAM confirmation Number	072816INTEFSW00010300061050
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	Transmittal Letter	1	1
	Information Disclosure Statement (IDS) Form (SB08)	2	2

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	2836
Serial No.	:	13/608,956	Examiner	:	Hal Ira Kaplan
Filed	:	September 10, 2012	Conf. No.	:	4270
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

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P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-1449 Form. Copies of foreign patent documents and non-patent literature are enclosed; copies of cited U.S. patents and patent application publications will be provided upon request. A copy of a communication from a foreign patent office in a counterpart application is enclosed.

This statement is being filed after a final action or a notice of allowance, but before payment of the issue fee. Each item of information in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this information disclosure statement. See 37 CFR 1.97(e)(1). A late submission fee in the amount of $180, specified by 37 CFR §1.17(p) is being paid with this statement.

Please apply any other necessary charges or credits to deposit account 06-1050, referencing the above Attorney Docket Number 25236-0036001. Please contact the undersigned if there are any questions regarding this Statement.

Respectfully submitted,

Date: July 28, 2016

/Peter R. Poulin Reg. No. 74,643/
Peter Poulin
Reg. No. 74,643

Customer Number 26161
Fish & Richardson P.C.
Telephone: 6175425070
Facsimile: (877) 769-7945

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	:	2836
Serial No.	:	13/608,956	Examiner	:	Hal Ira Kaplan
Filed	:	September 10, 2012	Confirmation No.	:	4270
			Notice of Allowance Date: April 28, 2016		
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS			

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Alexandria, VA 22313-1450

REPLY TO NOTICE OF ALLOWANCE

In response to the Notice of Allowance dated April 28, 2016, enclosed is a completed Part B - Fee(s) Transmittal.

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COMMENTS ON EXAMINER'S REASONS FOR ALLOWANCE

It is recognized that in accordance with M.P.E.P. § 1302.14, the Examiner's reasons for allowance need not set forth all of the details as to why the claims are allowed. In the above-referenced application, it is not conceded that the Examiner's stated reasons for allowance are the only reasons for which the claims are allowable. The Examiner's reasons for allowance indicate that particular claim elements are not disclosed or suggested by the prior art of record, yet the claims may be patentable for other reasons as well, including the inventive combination of all of the recited claim elements. It is not conceded that the specific limitations identified by the Examiner are necessary to distinguish the art of record or to satisfy the requirements of 35 U.S.C. § 112. Moreover, the Examiner does not assert, and it would not be conceded, that the Examiner's reasons have any bearing on the patentability of claims in any other applications directed to the disclosed subject matter.

In addition, each dependent claim stands on its own and may be allowable on its own merits. In particular, each dependent claim may be allowable on the basis of a combination of some of the features recited in the dependent claim and its base claim(s), which combination of features may not include all of the limitations identified in the Examiner's reasons for allowance.

Respectfully submitted,

Date: July 28, 2016

/Peter R. Poulin Reg. No. 74,643/
Peter R. Poulin
Reg. No. 74,643

Customer Number 26161
Fish & Richardson P.C.
Telephone: 6175425070
Facsimile: (877) 769-7945

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

TITLE OF INVENTION: FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	LARGE	$960	$0	$0	$960	07/28/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
KAPLAN, HAL IRA	2836	307-104000

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[ ] Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

[ ] "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

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(B) RESIDENCE: (CITY and STATE OR COUNTRY): Watertown, MA

Please check the appropriate assignee category or categories (will not be printed on the patent): **[**] Individual [X] Corporation or other private group entity [ ] Government

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Authorized Signature /Peter R. Poulin Reg. No. 74,643/ Date July 28, 2016

Typed or printed name Peter Poulin Registration No. 74,643

Electronic Patent Application Fee Transmittal

Application Number:	13608956
Filing Date:	10-Sep-2012
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Filer:	Peter Poulin/Cheryl Forrest
Attorney Docket Number:	25236-0036001

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Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
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Utility Appl Issue Fee	1501	1	960	960

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Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Peter Poulin/Lisa Peterson
Filer Authorized By:	Peter Poulin
Attorney Docket Number:	25236-0036001
Receipt Date:	28-JUL-2016
Filing Date:	10-SEP-2012
Time Stamp:	11:30:16
Application Type:	Utility under 35 USC 111(a)

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Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30706 b56563ad380e50c2f33fba40e0dcbcb9fc9b48cd	no	2
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New International Application Filed with the USPTO as a Receiving Office

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Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	25236-0036001	13/608,956
	Applicant: Verghese, et al.	
	Filing Date: September 10, 2012	Group Art Unit: 2836

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1.						

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No
	2.							

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
/HK/	3.	Copy of Australian Patent Examination Report No. 1 by Examiner N. Ahmed Surobhi for Australian Patent Application No. 2012305688, dated May 11, 2016 (3 pages).

Examiner Signature	Date Considered
/HAL KAPLAN/	08/08/2016

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/10/2012	Simon Verghese	25236-0036001	4270

26161 7590 08/15/2016
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MINNEAPOLIS, MN 55440-1022

EXAMINER	
KAPLAN, HAL IRA	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
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P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/608,956	10 September, 2012	VERGHESE ET AL.	25236-0036001

FISH & RICHARDSON P.C. (BO)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
HAL KAPLAN	
ART UNIT	PAPER
2836	20160808

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

The reference cited on the July 28, 2016 IDS has been considered.

/HAL KAPLAN/
Primary Examiner, Art Unit 2836

FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. provisional patent application 61/532,785 filed September 9, 2011.

BACKGROUND

Field:

[0002] This disclosure relates to wireless energy transfer and methods for detecting foreign object debris (FOD) on wireless power transmission systems.

Description of the Related Art:

[0003] Energy or power may be transferred wirelessly using a variety of known radiative, or far-field, and non-radiative, or near-field, techniques as detailed, for example, in commonly owned U.S. patent application 12/613,686 published on May 6, 2010 as US 2010/010909445 and entitled "Wireless Energy Transfer Systems," U.S. patent application 12/860,375 published on December 9, 2010 as 2010/0308939 and entitled "Integrated Resonator-Shield Structures," U.S. patent application 13/222,915 published on March 15, 2012 as 2012/0062345 and entitled "Low Resistance Electrical Conductor," U.S. patent application 13/283,811 published on 10/28/2011 as 20120248981 and entitled "Multi-Resonator Wireless Energy Transfer for Lighting," the contents of which are incorporated by reference.

Change(s) applied to document, /N.B.H./ 1/4/2016

[0004] Wireless charging systems that rely on an oscillating magnetic field between two coupled resonators can be efficient, non-radiative, and safe. Non-magnetic and/or non-metallic objects that are inserted between the resonators may not substantially interact with the magnetic field used for wireless energy transfer. In some embodiments, users of wireless power transfer systems may wish to detect the presence of these "foreign objects" and may wish to control, turn down, turn off, alarm, and the like, the wireless power transfer system. Metallic objects and/or other objects inserted between the resonators may interact with the magnetic field of the wireless power transfer system in a way that causes the metallic and/or other objects to perturb the wireless energy transfer and/or to heat up substantially. In some embodiments, users of wireless power transfer systems may wish to detect the presence of these "foreign objects" and may wish to control, turn down, turn off, alarm, and the like, the wireless power transfer system.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /HK/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

Modified PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-645576		Mar 20, 1900	Tesla, N.	
	2.	US-649621		May 15, 1900	Tesla, N.	
	3.	US-787412		Apr 18, 1905	Tesla, N.	
	4.	US-1119732		Dec 1, 1914	Tesla, N.	
	5.	US-2133494		Oct 18, 1938	Waters, H. F.	
	6.	US-3517350		Jun 23, 1970	Beaver, William D.	
	7.	US-3535543		Oct 20, 1970	Dailey, C. C.	
Change(s) applied to document, N.G. 1/29/2016	8.	US-3780425		Dec 25, 1973	Penn et al. ~~Alan, William~~	
	9.	US-3871176		Mar 18, 1975	Schukei, Glen Elwin	
	10.	US-4088999		May 9, 1978	Fletcher, James C., et al.	
	11.	US-4095998		Jun 20, 1978	Hanson, Charles M.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /HK/

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Field

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(Not for submission under 37 CFR 1.99)

Application Number	13/608,956
Filing Date	Sep 10, 2012
First Named Inventor	Simon Verghese
Art Unit	2836
Examiner Name	Not Yet Assigned
Attorney Docket Number	WTCY-0064-P01

	37	20120313449	A1	2012-12-13	Kurs, Andre B., et al.	
	38	20120313742	A1	2012-12-13	Kurs, Andre B., et al.	
	39	20130007949	A1	2013-01-10	Kurs, Andre B., et al.	
	40	20130020878	A1	2013-01-24	Karalis, Aristeidis et al.	
	41	20130033118	A1	2013-02-07	Karalis, Aristeidis et al.	
Change(s) applied to document, /N.G./ 1/29/2016	42	20130038402	A1	02-2013 ~~2013-04-14~~	Karalis, Aristeidis, et al.	
	43	20130057364	A1	2013-03-07	Kesler, Morris P., et al.	
	44	20130062966	A1	2013-03-14	Verghese, Simon et al.	
	45	20130069753	A1	2013-03-21	Kurs, Andre B., et al.	
	46	20130099587	A1	2013-04-25	Lou, Herbert T. et al.	
	47	20130154389	A1	2013-06-20	Kurs, Andre B., et al.	
	48	20130159956	A1	2013-06-20	Verghese, Simon et al.	
	49	20130175874	A1	2013-07-11	Lou, Herbert T., et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /HK/

Substitute Disclosure Form / U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.	Application No.
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))	25236-0036001	13/608,956
	First Named Inventor: Simon Verghese	
	Filing Date: September 10, 2012	Group Art Unit: 2617

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	A57	8,400,019	3/19/2013	Joannopoulos et al.			
	A58	8,400,020	3/19/2013	Joannopoulos et al.			
	A59	8,400,021	3/19/2013	Joannopoulos et al.			
	A60	8,400,022	3/19/2013	Joannopoulos et al.			
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	A62	8,400,024	3/19/2013	Joannopoulos et al.			
	A63	8,406,823	3/26/2013	Kondo et al.			
	A64	8,457,547	6/4/2013	Meskens			
	A65	8,461,817	6/11/2013	Martin, et al.			
	A66	8,482,157	7/9/2013	Cook et al.			
	A67	8,552,592	10/8/2013	Schatz et al.			
	A68	8,569,914	10/29/2013	Karalis et al.			
	A69	8,587,153	11/19/2013	Schatz et al.			
	A70	8,587,155	11/19/2013	Giler et al.			
Change(s) applied	A71	8,598,743	12/3/2013	~~Katherine et al.~~ Hall	et al.		
to document,	A72	8,618,696	12/31/2013	Karalis et al.			
/N.G./	A73	8,629,578	1/14/2014	Kurs et al.			
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	A76	2004/0026998	2/12/2004	Henriott et al.			
	A77	2004/0130425	7/8/2004	Dayan et al.			
	A78	2005/0116683	6/2/2005	Cheng et al.			
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	A83	2006/0001509	1/5/2006	Gibbs			
	A84	2006/0010902	1/19/2006	Trinh et al.			

Examiner Signature	Date Considered
/HAL KAPLAN/	07/16/2015

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/608,956	09/13/2016	9442172	25236-0036001	4270

26161 7590 08/24/2016

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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 841 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Simon Verghese, Arlington, MA;
Morris P. Kesler, Bedford, MA;
Katherine L. Hall, Arlington, MA;
Herbert Toby Lou, Carlisle, MA;

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	:	Simon Verghese	Art Unit	: 2836
Patent No.	:	9,442,172	Examiner	: Hal Ira Kaplan
Issue Date	:	September 13, 2016	Conf. No.	: 4270
Serial No.	:	13/608,956		
Filed	:	September 10, 2012		
Title	:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS		

Attention Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION

Please issue a certificate of correction in accordance with the attached form.

All errors to be corrected were made in printing by the Patent and Trademark Office, and no fee is believed to be due.

Apply any other necessary charges or credits to Deposit Account 06- 1050, referencing the above attorney docket number.

Respectfully submitted,

Date: January 30, 2017

/Peter R. Poulin Reg. No. 74,643/

Peter Poulin
Reg. No. 74,643

Customer Number 26161
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Telephone: (617) 542-5070
Facsimile: (877) 769-7945

23579317.doc

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
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(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO.	:	9,442,172
APPLICATION NO.:		13/608,956
ISSUE DATE	:	September 13, 2016
INVENTOR(S)	:	Simon Verghese, Morris P. Kesler, Katherine L. Hall and Herbert T. Lou

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 12

Line 38, in Claim 9, after “readout” delete “circuitry”

Line 49, in Claim 11, after “adjust” delete “the”

MAILING ADDRESS OF SENDER (Please do not use customer number below):
Fish & Richardson P.C.
P.O. Box 1022
Minneapolis, MN 55440-1022

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and selection option2.

Electronic Acknowledgement Receipt

EFS ID:	28213520
Application Number:	13608956
International Application Number:	
Confirmation Number:	4270
Title of Invention:	FOREIGN OBJECT DETECTION IN WIRELESS ENERGY TRANSFER SYSTEMS
First Named Inventor/Applicant Name:	Simon Verghese
Customer Number:	26161
Filer:	Peter Poulin/Cheryl Forrest
Filer Authorized By:	Peter Poulin
Attorney Docket Number:	25236-0036001
Receipt Date:	31-JAN-2017
Filing Date:	10-SEP-2012
Time Stamp:	09:37:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	RequestforCOC.pdf	104264 d7cd6b35ef91fa82d959183e3748356735cce332	no	2

Warnings:

Information:	
Total Files Size (in bytes):	104264

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,442,172 B2
APPLICATION NO. : 13/608956
DATED : September 13, 2016
INVENTOR(S) : Simon Verghese et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

Column 12
Line 38, in Claim 9, after "readout" delete "circuitry"
Line 49, in Claim 11, after "adjust" delete "the"

Signed and Sealed this
Thirteenth Day of June, 2017

Joseph Matal

Joseph Matal
Performing the Functions and Duties of the
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office