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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.



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***EX PARTE* REEXAMINATION COMMUNICATION TRANSMITTAL FORM**

REEXAMINATION CONTROL NO. 96/000,355 .

PATENT UNDER REEXAMINATION 8013568 .

ART UNIT 3992 .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

Office Action in Ex Parte Reexamination	Control No. 96/000,355	Patent Under Reexamination 8013568	
	Examiner ANJAN K DEB	Art Unit 3992	AIA (FITF) Status No

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

- a. ☒ Responsive to the communication(s) filed on 12 March 2021.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

b. ☐ This action is made FINAL.

c. ☐ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire _____ month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c)**. If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. ☒ Notice of References Cited by Examiner, PTO-892. | 3. ☐ Interview Summary, PTO-474. |
| 2. ☐ Information Disclosure Statement, PTO/SB/08. | 4. ☐ _____. |

Part II SUMMARY OF ACTION

- 1a. ☒ Claims 1-24 are subject to reexamination.
- 1b. ☐ Claims _____ are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☐ Claims _____ are patentable and/or confirmed.
4. ☒ Claims 1-24 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☒ Acknowledgment is made of the priority claim under 35 U.S.C. 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the certified copies have
 - 1 ☐ been received.
 - 2 ☐ not been received.
 - 3 ☒ been filed in Application No. 11/997,272.
 - 4 ☐ been filed in reexamination Control No. _____.
 - 5 ☐ been received by the International Bureau in PCT application No. _____.

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

9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate 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.
10. ☐ Other: _____

cc: Requester (if third party requester)

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DETAILED ACTION

1.0 SUMMARY

This Office action addresses claims 1-24 of United States Patent Number US 8,013,568 (hereinafter "the '568 patent"), issued September 6, 2011 to Park et al., wherein it has been determined in the 96/000,355 reexamination, regarding the Order mailed 04/21/2021 granting *ex parte* reexamination, that a substantial new question of patentability was raised in the request for *ex parte* reexamination, filed on 03/12/2021 (hereafter "the Request").

1.1 Priority

As noted on its front page, the '568 patent claims priority from:

KR 10-2005-0069871 filed July 29, 2005

KR 10-2006-0038960 filed April 28, 2006

1.2 Status of Claims

Claims 1-24 are rejected.

2.0 REFERENCES CITED IN REQUEST

The examiner has considered a substantial new question of patentability has been raised by at least the following prior art reference submitted by Third Party Requester:

1. Korean Patent No. KR950005819B1 to Hong Chung-Sik, English Language
Translation ("Chung-Sik")

3.0 ISSUES RAISED IN THE REQUEST

Issue 1: Primary reference: Chung-Sik (KR950005819B1)

Requester states that the teaching of Chung-Sik references raises a substantial new question of patentability with respect to claims 1-24 of the '568 Patent (Request pages, 4-26).

4.0 REJECTIONS PROPOSED IN THE REQUEST

The following rejection is proposed in the request:

- 1) Claims 1-24 of the '568 Patent are obvious under 35 U.S.C. § 103(a) over Chung-Sik taken alone (request pages 4-26).

5.0 CLAIM REJECTION - 35 USC § 102

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 –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.1 Chung-Sik (cl. 1-3, 5-9, 11-15, 20)

Claim(s) 1-3, 5-9, 11-15 and 20 is/are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Chung-Sik (KR 950005819B1).

- 1. A contact-less chargeable battery including a charging circuit for charging an electric energy to a battery cell, the contact-less chargeable battery comprising:**

Chung-Sik discloses system for charging a battery 32 in a portable device by inductively coupling a voltage from a charger 12 (base unit) to a portable device 18. Inductively coupling a voltage from a charger to a portable device 18 is considered the same as contact-less chargeable battery (page 8-2, lines 6-7) (Fig. 1).

~~The present invention relates to a charge system of a radio-telephone. More specifically, the present invention relates to a contactless charge system of a radio-telephone for charging a battery in a portable device without contact between a charger of a radio-telephone and a voltage terminal of the portable device.~~

a high frequency AC current inducing unit to which a high frequency AC current is induced by means of a magnetic field generated from an external contact-less charging device;

Chung-Sik disclosed high frequency AC current inducing unit 38 (CONTACTLESS CHARGING UNIT) to which a high frequency AC current (10 KHZ) is induced by means of a magnetic field generated from an external contact-less charging device (induced voltage generating unit) (page 8-2, lines 17-18, and page 8-4, lines 47-51).

a rectifier for receiving the induced high frequency AC current and converting the induced high frequency AC current into a DC current;

Chung-Sik discloses rectifier 80 for receiving the induced high frequency AC current and converting the induced high frequency AC current into a DC current (page 8-2, lines 17-19) (Fig. 2).

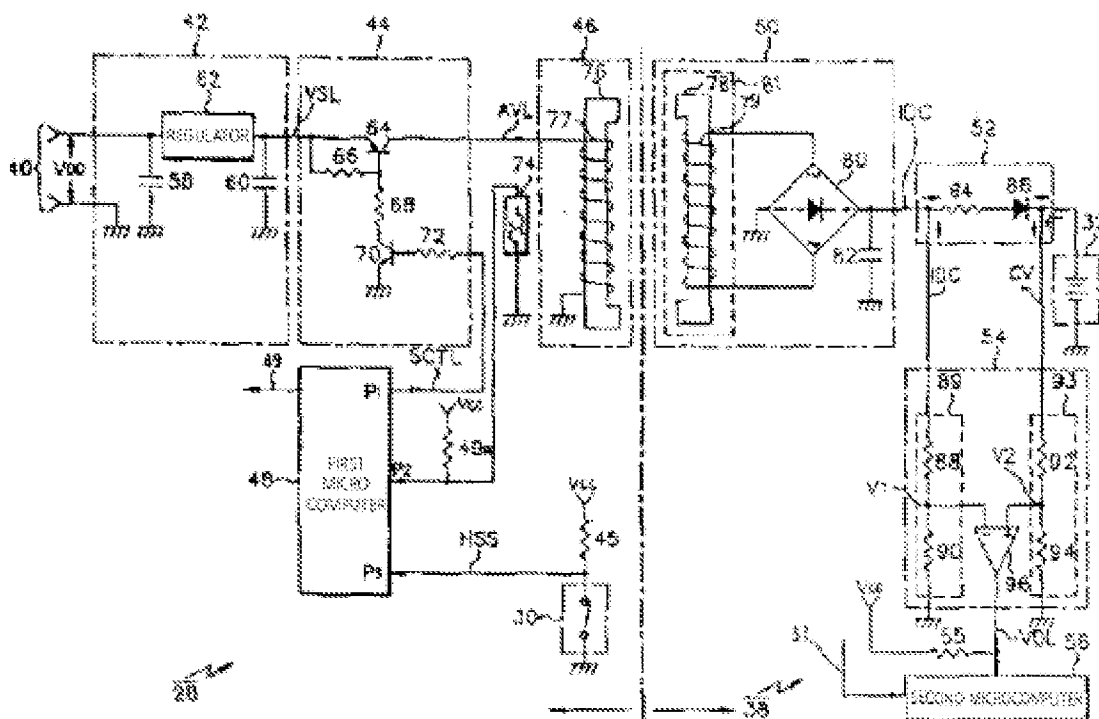
a constant voltage/constant current supplier for receiving the DC current from the rectifier and supplying a charging power to the battery cell in a constant voltage/constant current mode; and

Chung-Sik discloses constant voltage/current supplier for receiving DC current from the rectifier 80 and supplying a charging power to the battery cell 32 in a constant voltage/constant current charge mode (Fig. 2). (See “constant voltage unit”, page 8-3, lines 24-27). Chung-Sik further discloses rectifier 80 supplies DC current at a constant voltage V1 (reference voltage) (See “voltage V1 is constant”, page 8-5 line 5). Since voltage V1 is constant it is supplying a charging power to the battery cell in a constant voltage/constant current mode.

an overvoltage monitoring unit for monitoring voltages at both ends of the constant voltage/constant current supplier and transmitting a monitoring result to the external contact-less charging device by means of wireless communication so as to induce a change of intensity of the magnetic field.

Chung-Sik also discloses contactless charge system for detecting a voltage of a rechargeable battery 32 to control the charge between the charger 12 and the portable device 18 (page 8-2, lines 8-9)(Fig. 1) and specifically disclosed an over voltage monitoring unit 54 for monitoring voltages (V1, V2) at both ends of the constant voltage/current supplier 52 and transmitting a monitoring result to the external contactless charging device 12 by means of wireless communication (RADIO UNIT 34) so as to induce a change of intensity of the magnetic field of the induced voltage generating unit 46 (Fig. 1, 2) (page 8-2, lines 31-34, 40-55; page 8-3,

XIX



Chung-Sik. Fig. 2

2. The contact-less chargeable battery according to claim 1,

Chung-Sik discloses contact-less chargeable battery according to claim 1 as set forth above.

wherein the high frequency AC current inducing unit is a coil to which a magnetic flux of a magnetic field generated from the external contact-less charging device is linked.

Chung-Sik discloses wherein the high frequency AC current inducing unit is a coil 79 to which a magnetic flux of a magnetic field generated from the external (coil 77) contact-less charging device is linked. (Fig. 2).

3. The contact-less chargeable battery according to claim 1,

Chung-Sik discloses contact-less chargeable battery according to claim 1 as set forth above.

wherein the overvoltage monitoring unit includes: a wireless transmitting unit for wirelessly propagating the monitoring result through an antenna; first and second voltage detectors for respectively detecting voltages at front and rear ends of the constant voltage/constant current supplier;

Chung-Sik discloses over voltage monitoring unit 54 for monitoring voltages (V1, V2) at front and rear ends of the constant voltage/current supplier 52 and transmitting a monitoring result to the external contactless charging device 12 by means of wireless communication (RADIO UNIT 34) so as to induce a change of intensity of the magnetic field (page 8-2, paragraphs 7-8) of the induced voltage generating unit 46 (Fig. 2) (page 8-3, lines 31-34; page 8-5, lines 31-34) (Fig. 2).

a voltage comparator for comparing first and second voltages detected by the first and second voltage detectors and outputs a voltage comparison result; and a microprocessor for outputting a monitoring result according to the voltage comparison result to the wireless transmitting unit.

Chung-Sik discloses voltage comparator 96 for comparing first and second voltages (V1, V2) detected by the first and second voltage detectors and outputs a voltage comparison result (charge state VDL).

Chung-Sik further disclosed microprocessor 56 for outputting a monitoring result according to the voltage comparison result to the wireless transmitting unit (Fig. 2, page 8-4, 8-5).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

5. The contact-less chargeable battery according to claim 1, wherein the monitoring result is a charging power adjustment request signal.

Chung-Sik discloses contact-less chargeable battery according to claim 1 as set forth above.

Chung-Sik discloses outputting a charge state signal (VDL) which is input to second microcomputer 56 for controlling the portable device 18 (battery) (Fig. 2, page 8-3).

6. The contact-less chargeable battery according to claim 1, wherein the monitoring result is a difference of voltages at both ends of the constant voltage/constant current supplier, voltage values of both ends, or a code indicating that the voltages at both ends are in an overvoltage state.

Chung-Sik discloses contact-less chargeable battery according to claim 1 as set forth above.

Chung-Sik discloses battery voltage detector circuit 54 that includes first and second voltage splitters 89 and 93 for comparing a voltage V1 of an input terminal of the charging unit 52 with a voltage V2 of an output terminal and clocking the result, and a comparator 96 for comparing outputs of the first and second voltage splitters 89 and 93 (V1, V2) and outputting a charge state signal (VDL) to second microcomputer 56 based on the difference of voltage (V1-V2) at both ends of the constant voltage/constant current supplier. The second microcomputer 56 searches for whether or not a charge voltage of the battery 32 is normal in an operation (120 of FIG. 3B) based on the result of the difference of voltage (V1-V2). Additionally, Chung-Sik discloses outputting code (NO) indicating (overvoltage state) if charge voltage is not normal (see (120 of FIG. 3B) (Fig. 2, page 8-4, lines 40-42).

7. A contact-less charging circuit module electrically connected to a battery cell and used for charging an electric energy to the battery cell in a contact-less method, the contact-less charging circuit module comprising:

Chung-Sik disclosed contact-less charging circuit module electrically connected to a battery cell 32 of portable device 18 and used for charging an electric energy to the battery cell 32 in a contact-less method (Fig. 1, page 8-1).

The present invention relates to a charge system of a radio-telephone. More specifically, the present invention relates to a contactless charge system of a radio-telephone for charging a battery in a portable device without contact between a charger of a radio-telephone and a voltage terminal of the portable device.

a high frequency AC current inducing unit to which a high frequency AC current is induced by means of a magnetic field generated from an external contact-less charging device;

Chung-Sik disclosed high frequency AC current inducing unit 38 (CONTACTLESS CHARGING UNIT) to which a high frequency AC current is induced by means of a magnetic field generated from an external contact-less charging device (induced voltage generating unit) (page 8-2, lines 17-18).

a rectifier for receiving the induced high frequency AC current and converting the induced high frequency AC current into a DC current;

Chung-Sik discloses rectifier 80 for receiving the induced high frequency AC current and converting the induced high frequency AC current into a DC current (page 8-2, lines 17-19).(Fig. 2).

a constant voltage/constant current supplier for receiving the DC current from the rectifier and supplying a charging power to the battery cell in a constant voltage/constant current mode; and

Chung-Sik discloses constant voltage/current supplier 42 for receiving DC current from the rectifier 80 and supplying a charging power to the battery cell 32 in a constant voltage/constant current charge mode (Fig. 2). (See “constant voltage unit”, page 8-3, lines 28-33). Chung-Sik further discloses rectifier 80 supplies DC current at a constant voltage V1 (reference voltage). (See “voltage V1 is constant”, page 8-5 line 5).

5
6



terminal (+) of the comparator 96. In this case, the reference voltage V1 is constant and the charge level detection voltage V2 varies depending on a charge voltage level of the battery 32. Thus, when the first microcomputer 48 outputs the control signal

an overvoltage monitoring unit for monitoring voltages at both ends of the constant voltage/constant current supplier and transmitting a monitoring result to the external

contact-less charging device by means of wireless communication so as to induce a change of intensity of the magnetic field.

Chung-Sik also discloses contactless charge system for detecting a voltage of a rechargeable battery 32 to control the charge between the charger 12 and the portable device 18 (page 8-2, lines 8-9)(Fig. 1) and specifically disclosed an over voltage monitoring unit 54 for monitoring voltages (V1, V2) at both ends of the constant voltage/current supplier 52 and transmitting a monitoring result to the external contactless charging device 12 by means of wireless communication (RADIO UNIT 34) so as to induce a change of intensity of the magnetic field of the induced voltage generating unit 46 (page 8-2, lines 31-34, 49-55; page 8-3, lines 36-40; page 8-5, lines 1-8) (Fig. 2).

8. The contact-less charging circuit module according to claim 7, wherein the high frequency AC current inducing unit is a coil to which a magnetic flux of a magnetic field generated from the external contact-less charging device is linked.

Chung-Sik discloses contact-less chargeable battery according to claim 7 as set forth above.

Chung-Sik discloses wherein the high frequency AC current inducing unit is a coil 79 to which a magnetic flux of a magnetic field generated from the external (coil 77) contact-less charging device is linked. (Fig. 2).

9. The contact-less charging circuit module according to claim 7,

Chung-Sik discloses contact-less chargeable battery according to claim 7 as set forth above.

wherein the overvoltage monitoring unit includes:

a wireless transmitting unit for wirelessly propagating the monitoring result through an antenna;

Chung-Sik disclosed wireless transmitting unit (antenna connected to radio unit 34) for wirelessly propagating the monitoring result through an antenna connected to radio unit 34 (Fig. 1, and Fig. 2, page 8-5).

In this case, the data input to the line 49 is input as data that is wirelessly transmitted from the portable device 18 when the battery 32 is completely charged. If analysis of input data in operation 110 indicates the portable device is abnormal (i.e. charge is incomplete), the first microcomputer 48 jumps to the aforementioned step 106 to continuously generate a charge voltage, and when the portable device is normal, the first microcomputer 48 jumps to operation 112 to stop charging.

When a charge level of the battery 32 is increased through the aforementioned operation, the charge level detection voltage V2 of a second voltage splitter 93 increases, and when the detection voltage V2 becomes higher than the reference voltage V1, the output VDL of the comparator 96 is transitioned to logic "high" from logic "low" and is input to the second microcomputer 56.

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

first and second voltage detectors for respectively detecting voltages at front and rear ends of the constant voltage/constant current supplier;

Chung-Sik also discloses first and second voltage detectors (V1, V2) for respectively detecting voltages at front and rear ends of the constant voltage/constant current supplier 52 (Fig. 2).

a voltage comparator for comparing first and second voltages detected by the first and second voltage detectors and outputs a voltage comparison result; and

Chung-Sik discloses voltage comparator 96 for comparing first and second voltages (V1, V2) detected by the first and second voltage detectors and outputs a voltage comparison result (charge state VDL) (Fig. 2, page 8-4).

a microprocessor for outputting a monitoring result according to the voltage comparison result to the wireless transmitting unit.

Chung-Sik discloses second microprocessor 56 for outputting a monitoring result according to the voltage comparison result through line 37 to the wireless transmitting unit (antenna connected to radio unit 34). (Fig. 1, 2 and page 8-5).

11. The contact-less charging circuit module according to claim 1¹,

Chung-Sik discloses contact-less chargeable battery according to claim 1 as set forth above.

wherein the monitoring result is a charging power adjustment request signal.

Chung-Sik discloses outputting a charge state signal (VDL) which is input to second microcomputer 56 for controlling the portable device 18 (battery) (Fig. 2, page 8-3).

Chung-Sik discloses battery voltage detector circuit 54 that includes first and second voltage splitters 89 and 93 for comparing a voltage V1 of an input terminal of the charging unit

¹ It appears that Claim 11 should depend from claim 7 that recites a contact-less charging circuit module

52 with a voltage V2 of an output terminal and clocking the result, and a comparator 96 for comparing outputs of the first and second voltage splitters 89 and 93 (V1, V2) and outputting a charge state signal (VDL) to second microcomputer 56 based on the difference of voltage (V1-V2) at both ends of the constant voltage/constant current supplier. The second microcomputer 56 searches for whether or not a charge voltage of the battery 32 is normal in an operation (120 of FIG. 3B) based on the result of the difference of voltage (V1-V2). Additionally, Chung-Sik discloses outputting code (NO) indicating (overvoltage state) if charge voltage is not normal (see (120 of FIG. 3B) (Fig. 2, page 8-4, lines 40-42).

12. The contact-less charging circuit module according to claim 1,

Chung-Sik discloses contact-less chargeable battery according to claim 1 as set forth above.

wherein the monitoring result is a difference of voltages at front and rear ends of the constant voltage/constant current supplier, voltage values of the front and rear ends, or a code indicating that the voltages at both ends are in an overvoltage state.

Chung-Sik discloses battery voltage detector circuit 54 that includes first and second voltage splitters 89 and 93 for comparing a voltage V1 of an input terminal of the charging unit 52 with a voltage V2 of an output terminal and clocking the result, and a comparator 96 for comparing outputs of the first and second voltage splitters 89 and 93 (V1, V2) and outputting a charge state signal (VDL) to second microcomputer 56 based on the difference of voltage (V1-V2) at both ends of the constant voltage/constant current supplier. The second microcomputer 56 searches for whether or not a charge voltage of the battery 32 is normal in an

operation (120 of FIG. 3B) based on the result of the difference of voltage (V1-V2).

Additionally, Chung-Sik discloses outputting code (NO) indicating (overvoltage state) if charge voltage is not normal (see (120 of FIG. 3B) (Fig. 2, page 8-4, lines 40-42).

13. A contact-less charging device for transmitting a charging power by means of electromagnetic induction phenomenon to a contact-less chargeable battery that has a constant-voltage/constant current supplier to be capable of being charged in a constant voltage/constant current mode and,

Chung-Sik discloses contact-less charging device for transmitting a charging power by means of electromagnetic induction phenomenon to a contact-less chargeable battery 32 that has a constant-voltage/constant current supplier to be capable of being charged in a constant voltage/constant current mode (page 8-2, lines 6-7) (Fig. 1).

~~The present invention relates to a charge system of a radio-telephone. More specifically, the present invention relates to a contactless charge system of a radio-telephone for charging a battery in a portable device without contact between a charger of a radio-telephone and a voltage terminal of the portable device.~~

Chung-Sik discloses constant voltage/current supplier 42 for receiving DC current from the rectifier 80 and supplying a charging power to the battery cell 32 in a constant voltage/constant current charge mode (Fig. 2). (See “constant voltage unit”, page 8-3, lines 24-27). Chung-Sik further discloses rectifier 80 supplies DC current at a constant voltage V1 (reference voltage). (See “voltage V1 is constant”, page 8-5 line 5).

wirelessly transmits a monitoring result for voltages at both ends of the constant voltage/constant current supplier, the contact-less charging device comprising:

Chung-Sik discloses wirelessly transmitting a monitoring result for voltages at both ends of the constant voltage/constant current supplier (Chung-Sik, English Translation, pages 8-5, Fig. 2).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

a magnetic field generating unit for receiving an AC current and forming a magnetic field in an outer space;

Chung-Sik discloses magnetic field generating unit 46 (induced voltage generating unit) for receiving an AC current and forming a magnetic field in an outer space (space around coil 77). (Chung-Sik, English Translation, page 8-4 lines 47-51; and Fig. 2).

10 KHZ is generated from a collector of the transistor 64. The AC voltage of 10 KHZ generated from the collector of the transistor 64 is applied to the coil 77 wound in the induced voltage generating unit 46 through the alternating current line (AVL). When current of an AC voltage that alternates with a period of 10 KHZ flows in the coil 77, an electromagnetic field is generated around the coil 77, and a portion of a magnetic line of force is linked with the coil 79 wound around the core 78 in the induced voltage detecting unit 81.

a high frequency power driving unit for applying a high frequency AC current to the magnetic field generating unit; and

Chung-Sik discloses a high frequency power driving unit (transistor 64) for applying a high frequency AC current to the magnetic field generating unit 46 (Fig. 2, page 8-4).

control signal (SCTL), and the signal is applied to a base of the transistor 64. Thus, when the control signal (SCTL) having a period of about 10 KHZ is output from the output port P1 of the first microcomputer 48, AC power having a period of about 10 KHZ is generated from a collector of the transistor 64. The AC voltage of 10 KHZ generated from the collector of the transistor 64 is applied to the coil 77 wound in the induced voltage generating unit 46 through the alternating current line (AVL). When current of an AC voltage that alternates with a period of 10 KHZ flows in the coil 77, an electromagnetic field is generated around the coil 77, and a portion of a magnetic line of force is linked with the coil 79 wound around the core 78 in the induced voltage detecting unit 81.

a charging power adjusting unit for receiving the monitoring result from the contact-less chargeable battery by means of wireless communication and controlling the high frequency power driving unit to adjust a power of the high frequency AC current applied to the magnetic field generating unit so that a charging power transmitted to the battery is adjusted.

Chung-Sik disclosed charging power adjusting unit 48 (first microcomputer) for receiving the monitoring result from the contact-less chargeable battery by means of wireless communication by antenna connected to radio unit 34 and controlling the high frequency power driving unit (transistor 64) to adjust a power of the high frequency AC current applied to the magnetic field generating unit 46 so that a charging power transmitted to the battery 32 is adjusted. (Figs. 1, 2 & 3A, page 8-5).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

14. The contact-less charging device according to claim 13, wherein the magnetic field generating unit is a coil to both sides of which a high frequency AC current is applied.

Chung-Sik discloses contact-less chargeable battery according to claim 13 as set forth above.

Chung-Sik discloses wherein the magnetic field generating unit is a coil (77, 78) to both sides of which a high frequency AC current is applied. (Fig. 2, page 8-3).

15. The contact-less charging device according to claim 13,

Chung-Sik discloses contact-less charging device according to claim 13 as set forth above.

wherein the charging power adjusting unit includes:

a wireless receiving unit for wirelessly receiving the monitoring result through an antenna; and

Chung-Sik discloses wireless receiving unit (radio unit 26 connected to antenna) for wirelessly receiving the monitoring result through the antenna (Fig. 1).

a microprocessor for receiving the monitoring result from the wireless receiving unit and controlling the high frequency power driving unit to adjust a power of the high frequency AC current applied to the magnetic field generating unit.

Chung-Sik discloses first microprocessor 48 for receiving the monitoring result from the wireless receiving unit (radio unit 26) and controlling the high frequency power driving unit (transistor 64) to adjust a power of the high frequency AC current applied to the magnetic field generating unit (Fig. 1, 2 & 3A, pages 8-4, 8-5).

~~48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.~~

20. The contact-less charging device according to claim 13,

Chung-Sik discloses contact-less charging device according to claim 13 as set forth above.

wherein the monitoring result is a difference of voltages at both ends of the constant voltage/constant current supplier, voltage values at both ends, a code indicating that the voltages at both ends are in an overvoltage state, or a charging power adjustment request signal.

Chung-Sik discloses battery voltage detector circuit 54 that includes first and second voltage splitters 89 and 93 for comparing a voltage V1 of an input terminal of the charging unit 52 with a voltage V2 of an output terminal and clocking the result, and a comparator 96 for comparing outputs of the first and second voltage splitters 89 and 93 (V1, V2) and outputting a charge state signal (VDL) to second microcomputer 56 based on the difference of voltage (V1-V2) at both ends of the constant voltage/constant current supplier. The second microcomputer 56 searches for whether or not a charge voltage of the battery 32 is normal in an operation (120 of FIG. 3B) based on the result of the difference of voltage (V1-V2). Additionally, Chung-Sik discloses outputting code (NO) indicating (overvoltage state) if charge voltage is not normal (see (120 of FIG. 3B) (Fig. 2, page 8-4, lines 40-42).

6.0 CLAIM REJECTIONS - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6.1 Chung-Sik (cl. 4, 10, 19, 21-24)

Claims 4, 10, 19, and 21-24 are rejected under 35 U.S.C. 103(a) as being obvious over Chung-Sik (KR 950005819B1).

4. The contact-less chargeable battery according to claim 3,

Chung-Sik discloses contact-less chargeable battery according to claim 3 as set forth above.

wherein a magnetic field generated by the contact-less charging device is generated intermittently,

Chung-Sik discloses magnetic field generated by the contact-less charging device is generated intermittently (switches on/off transistor 70) (Fig. 2, page 8-4).

wherein the overvoltage monitoring unit further includes a charging pause detecting unit for receiving the high frequency AC current output from the high frequency AC current inducing unit to detect a time point when the induction of high frequency AC current ends, and then outputting the end time point to the microprocessor, and

Chung-Sik discloses a control signal (SCTL) output from the output port P1 of FIRST MICRO COMPUTER 48 is applied to a base of the transistor 70 through a resistor 72 and switches "on/off" the transistor 70 around ten thousand times per second. In this case, a potential of a collector terminal of the transistor 70 is switched between "low" and "high" depending on a period of the control signal (SCT) and the signal is applied to a base of the transistor 64." (Chung-Sik, English Translation, page 8-4 and Fig. 2).

Regarding charge pause detection unit and detecting a time point when the induction of high frequency AC current ends, and then outputting the end time point to the microprocessor, Chung-Sik discloses that the charging of battery continues until the detection voltage V2 in the overvoltage detection unit 54 becomes higher than V1 and the output signal VDL of comparator 96 is transitioned to logic "high" from logic "low" and is input to second microcomputer 56 to produce charging completion alarm (Fig. 2, page 8-5, lines 31-43). The transition to logic "high" from logic "low" is considered a time point when the induction of high frequency AC current ends, and then outputting the end time point (charge completion) to the microprocessor. The microcomputer 56 is broadly considered the same as charging pause detecting unit that produces charging completion alarm when the voltage of battery is determined to be normal and completely charged.

Additionally, Chung-Sik specifically disclosed a "time point" when the charge operation may be automatically stopped by communication between contact less charging unit 38 and power transmitter 28 (Chung-Sik, English Translation, page 8-5, lines 44-46 and Fig. 1).

Thus, in the present invention according to the above embodiments, a battery begins to be charged from a time point when the portable device 18 operated at an operating voltage of the battery is installed on the base unit 12, and the charge operation may be automatically stopped either by communication between devices or overheating of the devices.

To the extent that Chung-Sik may not specifically disclose charging pause detecting unit it would have been obvious to modify the overvoltage monitoring unit disclosed by Chung-Sik by adding a charging pause detecting unit because Chung-Sik specifically disclosed battery begins to be charged from a "time point" and the charge operation may be automatically stopped by communication between devices.

wherein the monitoring result is transmitted to the external contact-less charging device by means of wireless communication while a high frequency AC current is not induced after the end time point is input.

Chung-Sik discloses wherein the monitoring result is transmitted to the external contact-less charging device 12 by means of wireless communication by RADIO UNIT 34. (Chung-Sik, page 8-5, lines 35-43, Fig. 1, 2).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 56 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

Additionally, Chung-Sik specifically disclosed a “time point” when the charge operation may be automatically stopped by communication between contact less charging unit 38 and power transmitter 28 (Chung-Sik, English Translation, page 8-5, lines 44-46 and Fig. 1).

Thus, in the present invention according to the above embodiments, a battery begins to be charged from a time point when the portable device 18 operated at an operating voltage of the battery is installed on the base unit 12, and the charge operation may be automatically stopped either by communication between devices or overheating of the devices.

Although Chung-Sik did not specifically disclose communication while a high frequency AC current is not induced in the secondary coil after the end time point is input it would have been obvious for charging of the battery when voltage of the battery is determined to be less than normal (Fig. 2).

At the time the invention was made it would have been obvious to modify overvoltage monitoring unit disclosed by Chung-Sik by transmitting monitoring result to the external charging device by means of wireless communication while a high frequency AC current is not

induced in the secondary coil for starting charging of the battery when voltage of the battery is determined to be less than normal.

10. The contact-less charging circuit module according to claim 9,

Chung-Sik discloses contact-less charging circuit module according to claim 9 as set forth above.

wherein a magnetic field generated by the contact-less charging device is generated intermittently,

Chung-Sik discloses magnetic field generated by the contact-less charging device is generated intermittently (switches on/off transistor 70) (Fig. 2, page 8-4).

wherein the overvoltage monitoring unit further includes a charging pause detecting unit for receiving the high frequency AC current output from the high frequency AC current inducing unit to detect a time point when the induction of high frequency AC current ends, and then outputting the end time point to the microprocessor, and

Chung-Sik discloses a control signal (SCTL) output from the output port P1 of FIRST MICRO COMPUTER 48 is applied to a base of the transistor 70 through a resistor 72 and switches "on/off" the transistor 70 around ten thousand times per second. In this case, a potential of a collector terminal of the transistor 70 is switched between "low" and "high" depending on a period of the control signal (SCTL) and the signal is applied to a base of the transistor 64." (Chung-Sik, page 8-4, Fig. 2).

Regarding detecting a time point when the induction of high frequency AC current ends, and then outputting the end time point to the microprocessor, Chung-Sik discloses that the charging of battery continues until the detection voltage V2 becomes higher than V1 and the output signal VDL of comparator 96 is transitioned to logic "high" from logic "low" and is input to second microcomputer 56 to produce charging completion alarm (Fig. 2, page 8-5, lines 31-43). The transition to logic "high" from logic "low" is considered a time point when the induction of high frequency AC current ends, and then outputting the end time point (charge completion) to the microprocessor 56. The microcomputer 56 is broadly considered the same as charging pause detecting unit that produces charging completion alarm when the voltage of battery is determined to be normal and completely charged.

Additionally, Chung-Sik specifically disclosed a "time point" when the charge operation may be automatically stopped by communication between contact less charging unit 38 and power transmitter 28 (Chung-Sik, English Translation, page 8-5, lines 44-46 and Fig. 1).

~~Thus, in the present invention according to the above embodiments, a battery begins to be charged from a time point when the portable device 18 operated at an operating voltage of the battery is installed on the base unit 12, and the charge operation may be automatically stopped either by communication between devices or overheating of the devices.~~

To the extent that Chung-Sik may not specifically disclose a charging pause detecting unit it would have been obvious to modify the overvoltage monitoring unit disclosed by Chung-Sik by adding a charging pause detecting unit because Chung-Sik specifically disclosed battery begins to be charged from a "time point" and the charge operation may be automatically stopped by communication between devices.

wherein the monitoring result is transmitted to the external contact-less charging device by means of wireless communication while a high frequency AC current is not induced after the end time point is input.

Chung-Sik discloses wherein the monitoring result (VDL) output to second microprocessor 56 is transmitted to the external contact-less charging device by means of wireless communication by an antenna connected to radio unit 34. (Fig. 2, page 8-5).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 56 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

Additionally, Chung-Sik specifically disclosed a “time point” when the charge operation may be automatically stopped by communication between contact less charging unit 38 and power transmitter 28 (Chung-Sik, English Translation, page 8-5, lines 44-46 and Fig. 1).

Thus, in the present invention according to the above embodiments, a battery begins to be charged from a time point when the portable device 18 operated at an operating voltage of the battery is installed on the base unit 12, and the charge operation may be automatically stopped either by communication between devices or overheating of the devices.

Although Chung-Sik did not specifically disclose communication while a high frequency AC current is not induced in the secondary coil after the end time point is input it would have been obvious for charging of the battery when voltage of the battery is determined to be less than normal (Fig. 2).

At the time the invention was made it would have been obvious for the charging power adjusting unit disclosed by Chung-Sik to transmit a monitoring result to the charging device by means of wireless communication while a high frequency AC current is not induced in the

secondary coil for starting charging of the battery when voltage of the battery is determined to be less than normal.

19. The contact-less charging device according to claim 13,

Chung-Sik discloses contact-less charging device according to claim 13 as set forth above.

wherein the high frequency power driving unit intermittently applies a high frequency AC current to the magnetic field generating unit, and

Chung-Sik discloses a high frequency power driving unit 44 (voltage switching unit) for intermittently applying a high frequency AC current by switching on/off transistor 70 to the magnetic field generating unit 46 (induce voltage generating unit) (Fig. 2, page 8-3).

wherein the charging power adjusting unit receives the monitoring result while a high frequency AC current is not applied to the magnetic field generating unit.

Chung-Sik discloses wherein the monitoring result is transmitted to the external contact-less charging device by means of wireless communication. (Chung-Sik, page 8-5, Fig. 2).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

Although Chung-Sik did not specifically disclose charging power adjusting unit receives the monitoring result while a high frequency AC current is not applied to the magnetic field

generating unit it would have been obvious for charging of the battery when voltage of the battery is determined to be less than normal (Fig. 2).

At the time the invention was made it would have been obvious for the charging power adjusting unit disclosed by Chung-Sik to transmit a monitoring result to the charging device by means of wireless communication while a high frequency AC current is not induced in the secondary coil for starting charging of the battery when voltage of the battery is determined to be less than normal.

21. A battery charging set including a contact-less chargeable battery and a contact-less charging device, wherein the battery includes:

Chung-Sik discloses battery charging set including a contact-less chargeable battery and a contact-less charging device. (page 8-2, lines 6-7) (Fig. 1).

~~The present invention relates to a charge system of a radio-telephone. More specifically, the present invention relates to a contactless charge system of a radio-telephone for charging a battery in a portable device without contact between a charger of a radio-telephone and a voltage terminal of the portable device.~~

a high frequency AC current inducing unit to which a high frequency AC current is induced by means of a magnetic field intermittently generated from an external contact-less charging device;

Chung-Sik discloses high frequency AC current inducing unit to which a high frequency AC current is induced by means of a magnetic field intermittently generated from an external

contact-less charging device. (Fig. 2, page 8-4).

control signal (SCTL), and the signal is applied to a base of the transistor 64. Thus, when the control signal (SCTL) having a period of about 10 KHZ is output from the output port P1 of the first microcomputer 48, AC power having a period of about 10 KHZ is generated from a collector of the transistor 64. The AC voltage of 10 KHZ generated from the collector of the transistor 64 is applied to the coil 77 wound in the induced voltage generating unit 46 through the alternating current line (AVL). When current of an AC voltage that alternates with a period of 10 KHZ flows in the coil 77, an electromagnetic field is generated around the coil 77, and a portion of a magnetic line of force is linked with the coil 79 wound around the core 78 in the induced voltage detecting unit 81.

a rectifier for receiving the induced high frequency AC current and converting the induced high frequency AC current into a DC current;

Chung-Sik discloses rectifier 80 for receiving the induced high frequency AC current and converting the induced high frequency AC current into a DC current (page 8-2, lines 17-19) (Fig. 2).

a constant voltage/constant current supplier for receiving the DC current from the rectifier and supplying a charging power to a battery cell in a constant voltage/constant current mode; and

Chung-Sik discloses constant voltage/current supplier 42 for receiving DC current from the rectifier 80 and supplying a charging power to the battery cell 32 in a constant voltage/constant current charge mode (Fig. 2). (See "constant voltage unit", page 8-3, lines 24-27). Chung-Sik further discloses rectifier 80 supplies DC current at a constant voltage V1 (reference voltage). (See "voltage V1 is constant", page 8-5 line 5).

an overvoltage monitoring unit for monitoring voltages at both ends of the constant voltage/constant current supplier and transmitting a monitoring result to the external contact-less charging device by means of wireless communication while a high frequency AC current is not induced, wherein the charging device includes:

Chung-Sik also discloses contactless charge system for detecting a voltage of a rechargeable battery 32 to control the charge between the charger 12 and the portable device 18 (page 8-2, lines 8-9)(Fig. 1) and specifically disclosed an over voltage monitoring unit 54 for monitoring voltages (V1, V2) at both ends of the constant voltage/current supplier 52 and transmitting a monitoring result to the external contactless charging device 12 by means of wireless communication (RADIO UNIT 34) so as to induce a change of intensity of the magnetic field (page 8-2, lines 49-55) of the induced voltage generating unit 46 (Fig. 2) (page 8-3, lines 29-34; page 8-5, lines 35-43) (Fig. 2).

Chung-Sik further discloses wherein the monitoring result is transmitted to the external contact-less charging device by means of wireless communication. (Chung-Sik, pages 8-5, Fig. 2).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

Although Chung-Sik did not specifically disclose transmitting a monitoring result to the external contact-less charging device by means of wireless communication while a high frequency AC current is not induced it would have been obvious for charging the battery when voltage of the battery is determined to be less than normal (Fig. 2).

At the time the invention was made it would have been obvious to modify the overvoltage monitoring unit disclosed by Chung-Sik to transmit the monitoring result while a high frequency AC current is not applied to the magnetic field generating unit for starting charging of the battery when voltage of the battery is determined to be less than normal.

a magnetic field generating unit for receiving an AC current and forming a magnetic field in an outer space;

Chung-Sik discloses magnetic field generating unit 46 (induced voltage generating unit) for receiving an AC current and forming a magnetic field in an outer space (space around coil 77). (Fig. 2, page 8-4).

a high frequency power driving unit for intermittently applying a high frequency AC current to the magnetic field generating unit; and

Chung-Sik discloses a high frequency power driving unit 44 (voltage switching unit) for intermittently applying a high frequency AC current by switching on/off transistor 70 to the magnetic field generating unit 46 (induced voltage generating unit) (Fig. 2, page 8-3).

a charging power adjusting unit for, while a high frequency AC current is not applied to the magnetic field generating unit, receiving the monitoring result by means of wireless communication and controlling the high frequency power driving unit to adjust a power of the high frequency AC current applied to the magnetic field generating unit so that a charging power transmitted to the battery is adjusted.

Chung-Sik discloses Chung-Sik disclosed charging power adjusting unit 48 (first microcomputer) for receiving the monitoring result from the contact-less chargeable battery by wireless communication through antenna connected to radio unit 34 and controlling the high frequency power driving unit (transistor 64) to adjust a power of the high frequency AC current applied to the magnetic field generating unit 46 so that a charging power transmitted to the

battery 32 is adjusted. (Figs. 1, 2 & 3A, page 8-5).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 123. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

Although Chung-Sik did not specifically disclose charging power adjusting unit 48 (first microcomputer) receives the monitoring result while a high frequency AC current is not applied to the magnetic field generating unit 46 (induced voltage generating unit) it would have been obvious to do for charging of the battery when voltage of the battery is determined to be less than normal (Fig. 2).

At the time the invention was made it would have been obvious for the charging power adjusting unit disclosed by Chung-Sik to receives the monitoring result while a high frequency AC current is not applied to the magnetic field generating unit for starting charging of the battery when voltage of the battery is determined to be less than normal.

22. The battery charging set according to claim 21,

Chung-Sik discloses battery charging set according to claim 21 as set forth above.

wherein the monitoring result is a difference of voltages at both ends of the constant voltage/constant current supplier, voltage values at both ends, a code indicating that the voltages at both ends are in an overvoltage state, or a charging power adjustment request signal.

Chung-Sik discloses battery voltage detector circuit 54 that includes first and second voltage splitters 89 and 93 for comparing a voltage V1 of an input terminal of the charging unit 52 with a voltage V2 of an output terminal and clocking the result, and a comparator 96 for comparing outputs of the first and second voltage splitters 89 and 93 (V1, V2) and outputting a charge state signal (VDL) to second microcomputer 56 based on the difference of voltage (V1-V2) at both ends of the constant voltage/constant current supplier. The second microcomputer 56 searches for whether or not a charge voltage of the battery 32 is normal in an operation (120 of FIG. 3B) based on the result of the difference of voltage (V1-V2). Additionally, Chung-Sik discloses outputting code (NO) indicating (overvoltage state) if charge voltage is not normal (see (120 of FIG. 3B) (Fig. 2, page 8-4, lines 40-42).

23. A method for controlling charging of a contact-less chargeable battery using a contact-less charging device by means of electromagnetic induction phenomenon, the method comprising:

Chung-Sik discloses method for controlling charging of a contact-less chargeable battery 32 in a portable device by means of electromagnetic induction phenomenon by inductively coupling a voltage from a charger 12 (base unit) to a portable device 18 comprising contactless charging unit 38 for charging chargeable battery 32 (page 8-2, lines 6-7) (Fig. 1).

~~The present invention relates to a charge system of a radio-telephone. More specifically, the present invention relates to a contactless charge system of a radio-telephone for charging a battery in a portable device without contact between a charger of a radio-telephone and a voltage terminal of the portable device.~~

(a) intermittently applying a high frequency AC current to a primary coil provided to the charging device so as to intermittently generate a magnetic field in an outer region;

Chung-Sik discloses intermittently applying a high frequency AC current to a primary coil 77 provided to the charging device by a voltage switching unit 44 by turning on/off transistor 64 so as to intermittently generate a magnetic field in an outer region around coil 77 (Fig. 2).

(b) linking a magnetic flux of the generated magnetic field to a secondary coil provided to the battery so as to intermittently output an electromagnetically-induced high frequency AC current;

Chung-Sik discloses linking a magnetic flux of the generated magnetic field of coil 77 to a secondary coil 79 provided to the battery 32 so as to intermittently output an electromagnetically-induced high frequency AC current (Fig. 2).

(c) rectifying the output high frequency AC current to be converted into a DC current;

Chung-Sik discloses rectifying the high frequency AC current output from coil 79 and converted into a DC current (Fig. 2, page 8-3).

The induced voltage rectifying unit 50 includes a core 78 and a coil 79 wound around the core 78, and includes an induced voltage detecting unit 81 that is inductively coupled to the induced voltage generating unit 46, and a rectifier 80 for rectifying a voltage output from the coil 79 of the induced voltage detecting unit 81.

(d) applying the DC current to a battery cell through a constant voltage/constant current supplier so as to charge the battery cell in a constant voltage/constant current mode;

Chung-Sik discloses applying the DC current to a battery cell 32 through a constant voltage/constant current supplier (80, 52) (see “constant voltage V1”) so as to charge the battery cell in a constant voltage/constant current mode (Fig. 2, page 8-4, lines 59-62; page 8-5, line 5).

In this case, the rectified voltage IDC is input to a first voltage splitter 89, simultaneously limited to a predetermined level through the resistor 84 and the diode 86, then applied to the battery 32. That is, the battery 32 is charged. In the above case, the resistor 84 is a current limiter resistor, and the diode 86 is a diode for preventing countercurrent when the voltage IDC is lower than a voltage of the battery 32.

terminal (+) of the comparator 96. In this case, the reference voltage V1 is constant and the charge level detection voltage V2

(e) monitoring voltages at both ends of the constant voltage/constant current supplier and transmitting a monitoring result to the charging device by means of wireless communication while a high frequency AC current is not induced in the secondary coil; and

Chung-Sik discloses contactless charge device for detecting a voltage of a rechargeable battery 32 to control the charge between the charger 12 and the portable device 18 (Chung-Sik , English Translation, page 8-2, lines 8-9)(Fig. 1) and specifically disclosed an over voltage monitoring unit 54 for monitoring voltages (V1, V2) at both ends of the constant voltage/current supplier 52 and transmitting a monitoring result to the external contactless charging device 12 by means of wireless communication (RADIO UNIT 34) so as to induce a change of intensity of the magnetic field of the induced voltage generating unit 46 (Fig. 2)(Chung-Sik , English Translation, page 8-2, lines 40-55; page 8-3, lines 36-40; page 8-5, lines 35-43) (Fig. 2).

Although Chung-Sik did not specifically disclose communication while a high frequency AC current is not induced in the secondary coil it would have been obvious to do so for charging of the battery when voltage of the battery is determined to be less than normal (Fig. 2).

At the time the invention was made it would have been obvious for the charging power adjusting unit disclosed by Chung-Sik to transmit a monitoring result to the charging device by means of wireless communication while a high frequency AC current is not induced in the secondary coil for starting charging of the battery when voltage of the battery is determined to be less than normal.

(f) adjusting a power of the high frequency AC current applied to the primary coil according to the transmitted monitoring result.

Chung-Sik disclosed charging power adjusting unit 48 (first microcomputer) for receiving the monitoring result from the contact-less chargeable battery by means of wireless communication by antenna connected to radio unit 34 and controlling the high frequency power driving unit (transistor 64) to adjust a power of the high frequency AC current applied to the magnetic field generating unit 46 so that a charging power transmitted to the battery 32 is adjusted. (Figs. 1, 2 & 3A, page 8-5).

Here, in the aforementioned operation 120 of FIG. 3B, the second microcomputer 56 that scans the output VDL of the comparator 96 and searches for whether or not the charge voltage is normal determines that the charge voltage of the battery 32 is normal. That is, a voltage of the battery 32 is determined to be completely charged to a set voltage level, and a charge completion alarm signal is output through line 37 in operation 122. The charge completion alarm signal through line 37 is transmitted to the base unit 12 through the audio and logic unit 36 and the radio unit 34, and the radio unit 25 and the audio and logic unit 24 of the base unit 12 receive and demodulate the signal and input the signal to the first microcomputer 48 through the line 49. The first microcomputer 48 that receives a data signal through the line 49 determines that the charge completion signal is received from the portable device 18 in the aforementioned operation 110 of FIG. 3A (the portable device is normal), and performs operation 112.

24. The method according to claim 23, wherein the monitoring result is a difference of voltages at both ends of the constant voltage/constant current supplier, voltage values at both ends, a code indicating that the voltages at both ends are in an overvoltage state, or a charging power adjustment request signal.

Chung-Sik discloses method according to claim 23 as set forth above.

Chung-Sik discloses battery voltage detector circuit 54 includes first and second voltage splitters 89 and 93 for comparing a voltage V_1 of an input terminal of the charging unit 52 with a voltage V_2 of an output terminal and clocking the result, and a comparator 96 for comparing outputs of the first and second voltage splitters 89 and 93 (V_1 , V_2) and outputting a charge state signal (VDL) to second microcomputer 56 based on the difference of voltage ($V_1 - V_2$) at both ends of the constant voltage/constant current supplier. The second microcomputer 56 searches for whether or not a charge voltage of the battery 32 is normal in an operation (120 of FIG. 3B) based on the result of the difference of voltage ($V_1 - V_2$). Additionally, Chung-Sik discloses outputting code (NO) indicating (overvoltage state) if charge voltage is not normal (see (120 of FIG. 3B) (Fig. 2, page 8-4, lines 40-42).

6.2 Chung-Sik, Cho (cl. 16-18)

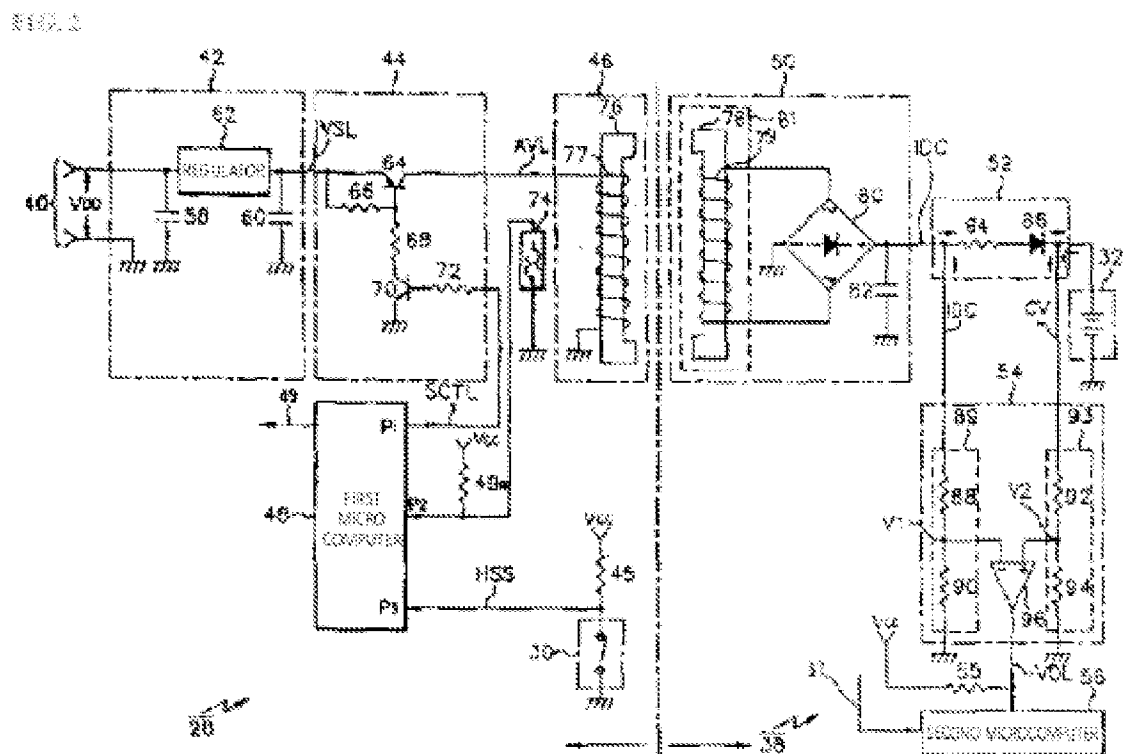
Claims 16-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Chung-Sik as applied to claim 15 above, and further in view of Cho Gyu Hyeong et al. (KR 100451606 B1)(Hereafter Cho et al).

16. The contact-less chargeable battery according to claim 15,

Chung-Sik discloses contact-less chargeable battery according to claim 15 as set forth above.

further comprising a constant voltage supplier for converting a common AC current, converting the common AC current into a DC current, and then supplying a constant-voltage current to the high frequency power driving unit,

control signal (SCTL), and the signal is applied to a base of the transistor 64. Thus, when the control signal (SCTL) having a period of about 10 KHZ is output from the output port P1 of the first microcomputer 48, AC power having a period of about 10 KHZ is generated from a collector of the transistor 64. The AC voltage of 10 KHZ generated from the collector of the transistor 64 is applied to the coil 77 wound in the induced voltage generating unit 46 through the alternating current line (AVL). When current of an AC voltage that alternates with a period of 10 KHZ flows in the coil 77, an electromagnetic field is generated around the coil 77, and a portion of a magnetic line of force is linked with the coil 79 wound around the core 78 in the induced voltage detecting unit 81.



Chung-Sik. Fig. 2

Chung-Sik did not disclose constant voltage supplier for converting a common AC current, converting the common AC current into a DC current, because Chung-Sik receives 12 VDC directly from the power line 40 (Fig. 1, page 8-4, lines 4-5). However, if a DC power supply is not available it would have been obvious to one of ordinary skill in the art to add a rectifier for the conversion of power line AC voltage to DC.

In analogous art Cho et al. (KR 100451606 B1) disclosed AC / DC rectifier 11 receives a low frequency AC input voltage, such as 110V or 220V, and converts it into direct current Vdc (Fig. 1). Cho et al. (KR 100451606 B1) further discloses a constant voltage supplying part (DC/DC converter 12) for receiving the converted DC current Vdc and outputs a constant voltage current (Vdc). (Fig. 2).

At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the contact-less charging device disclosed by Chung-Sik by adding a rectifier for rectifying the AC current received from AC power line to convert the AC current into a DC current disclosed by Cho et al. (KR 100451606 B1) and adding a constant voltage supplying part for receiving the converted DC current disclosed by Cho et al. (KR 100451606 B1) to output a constant voltage current.

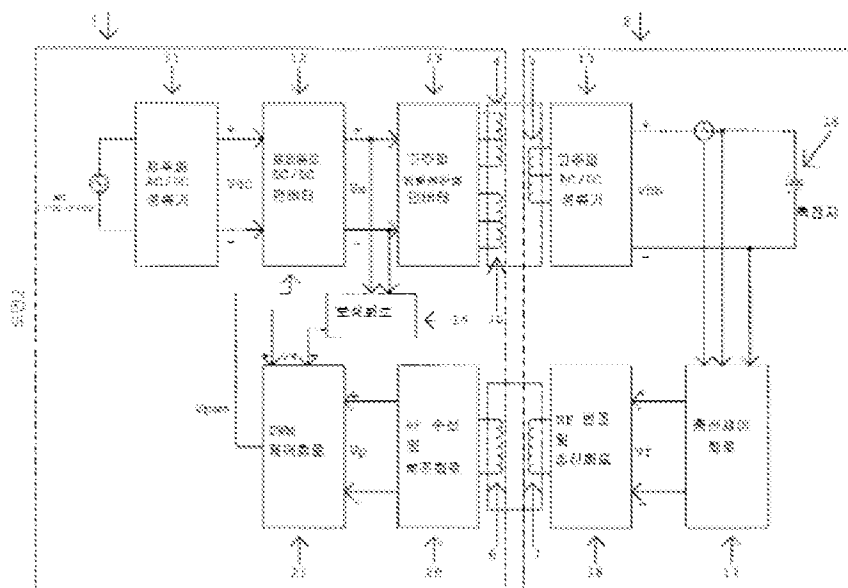


Fig. 2. Cho et al. (KR 100451606 B1)

wherein the high frequency power driving unit includes:

a pulse signal generator for receiving a pulse driving signal from the microprocessor and outputting a pulse signal; and

Chung-Sik discloses high frequency power driving unit (voltage switching unit 44) receives driving signal SCTL (control signal) of predetermined period is output from first microprocessor 48 and applied to voltage switching unit 44 (charge voltage generating unit 28 shown in Fig. 1) comprising transistors 72 and 64 (Fig. 2, page 8-3, lines 28-35. Chung-Sik specifically disclosed the charge voltage generating device includes a charge control pulse generator which generates a pulse sequence with a predetermined period. (Fig. 2, page 8-6, lines

21-24).

a charge voltage generating device including a charge control pulse generator which generates a pulse sequence with a predetermined period in response to input of a charge initiation signal, a voltage switch which converts and outputs a DC voltage at a predetermined level into an AC voltage in response to input of the generated pulse sequence, and a voltage

In an analogous art, Cho et al. disclosed contact-less chargeable battery comprising control circuit (PWM 21) configured to receive a control signal and generate a pulse width modulated signal (Vpwm) to be applied to the DC / DC converter to adjust the DC voltage (Fig. 2, Cho et al. English Translation, page 3, 2nd paragraph).

At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify Chung-Sik by adding pulse signal generator for generating a pulse width modulated signal (PWM) disclosed by Cho et al. for adjusting charging power for charging a contact-less chargeable battery.

a power driving part for receiving the pulse signal to rapidly switch the constant-voltage current input from the constant voltage supplier, thereby generating a high frequency AC current in a pulse pattern.

Chung-Sik discloses power driving part (voltage switching unit 44) for receiving the pulse signal (SCTL) from the first microprocessor 48 to rapidly switch the constant-voltage current input from the constant voltage supplier 42, thereby generating a high frequency AC current in a pulse pattern (Fig. 2). Chung-Sik specifically discloses charge control pulse generator which generates a pulse sequence (pulse pattern) with a predetermined period. (Fig. 2, page 8-6, lines 21-24).

a charge voltage generating device including a charge control pulse generator which generates a pulse sequence with a predetermined period in response to input of a charge initiation signal, a voltage switch which converts and outputs a DC voltage at a predetermined level into an AC voltage in response to input of the generated pulse sequence, and a voltage

Additionally, Cho et al. disclosed power driving part (DC / DC converter 12) for receiving the pulse signal (V_{pwm}) to rapidly switch the constant-voltage current input from the constant voltage supplier V_{dc} , thereby generating a high frequency AC current in a pulse pattern input to winding 4 of transformer (Fig. 2).

17. The contact-less charging device according to claim 16, wherein the charging power adjusting unit adjusts a charging power by modulating a width of a pulse current, a frequency of the pulse current, an amplitude of a pulse, or the number of pulses.

Chung-Sik discloses contact-less charging device according to claim 16 as set forth above.

Chung-Sik discloses voltage switching unit 44 for switching a power voltage at a predetermined level in response to an input of a control signal SCTL with a predetermined period and converting and outputting an AC voltage. When the control signal (SCTL) is blocked, both the transistors 64 and 70 with respect to the voltage switching unit 44 are switched "off" to block a voltage of the AC line (AVL). Thus voltage switching unit 44 adjusts the charging power by switching on transistor 64 in response to the control signal SCTL with a predetermined period (Fig. 2, page 8-3, lines 28-33). Chung-Sik further discloses that the charging of battery continues until the detection voltage V_2 becomes higher than V_1 and the output signal VDL of comparator 96 is transitioned to logic "high" from logic "low" and is input to second microcomputer 56 to produce charging completion alarm (Fig. 2, page 8-5, lines 31-43). Thus Chung-Sik discloses adjusting the charging power by providing a number of pulses until charge completion.

Additionally, Cho et al. disclosed control circuit (PWM 21) configured to receive a control signal and generates a pulse width modulated signal (Vpwm) to be applied to the DC / DC converter to adjust the DC voltage (Fig. 2, Cho et al. English Translation, page 3, 2nd paragraph).

At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify Chung-Sik by adding PWM that receives a control signal to generate a pulse width modulated signal (Vpwm) disclosed by Cho et al. for adjusting charging power for charging a battery.

18. The contact-less charging device according to claim 16,

Chung-Sik discloses contact-less charging device according to claim 16 as set forth above.

wherein the constant voltage supplier includes:

an overvoltage filter for receiving a common AC current and intercepting an overvoltage current.

Chung-Sik discloses an overvoltage filter by capacitor 58 for receiving the power supply 20 current and intercepting an overvoltage current (Fig. 2, page 8-4, lines 6-7).

power transmitter 28 inputs a power voltage through the line 40. The power of the line 40 may be filtered by a capacitor 58 in the constant voltage unit 42 and is input to the regulator 62. The regulator 62 (which is a model No. 78×8 regulator series according to the present invention) regulates the input voltage of 12 VDC and outputs the voltage to the power supplying line (VSL).

a rectifier for rectifying the AC current passing through the filter to convert the AC current into a DC current; and a constant voltage supplying part for receiving the converted DC current and outputs a constant voltage current.

Chung-Sik discloses current passing through the filter is input to regulator 62 that provides regulated 12 VDC. (Fig. 2).

Chung-Sik did not disclose rectifying an AC current because Chung-Sik receives 12 VDC directly from the power line 40 (Fig. 1, page 8-4, lines 4-5). However, if a DC power supply is not available it would have been obvious to one of ordinary skill in the art to add a rectifier for the conversion of power line AC voltage to DC.

In analogous art Cho et al. (KR 100451606 B1) disclosed AC / DC rectifier 11 receives a low frequency AC input voltage, such as 110V or 220V, and converts it into direct current Vdc (Fig. 1). Cho et al. (KR 100451606 B1) further discloses a constant voltage supplying part (DC/DC converter 12) for receiving the converted DC current Vdc and outputs a constant voltage current (Vdc).

At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the contact-less charging device disclosed by Chung-Sik by adding a rectifier for rectifying the AC current received from AC power line to convert the AC current into a DC current disclosed by Cho et al. (KR 100451606 B1) and adding a constant voltage supplying part for receiving the converted DC current disclosed by Cho et al. (KR 100451606 B1) to output a constant voltage current.

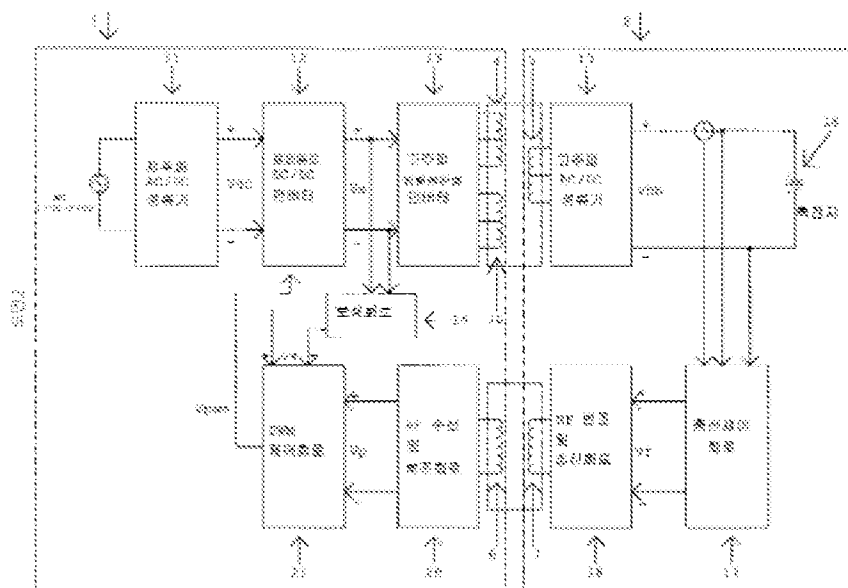


Fig. 2. Cho et al. (KR 100451606 B1)

7.0 CONCLUSION

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fernandez et al (US 6,184,651 B1) published 2001-02-06, disclosed contactless charging system, charging energy is transferred across an inductive coupler to charge a battery (21) of a portable device, such as a two-way radio, cellular phone, paging device, or wireless communicator (Abstract, Fig. 1). The secondary charging device 19 is electrically coupled to a sensing device 38 which provides to a radio transceiver 35 a feedback signal indicative of a charging parameter of the secondary charging device 19, such as indicative of a charging voltage. The radio transceiver 35 preferably comprises an encoder/decoder to encode a signal for radio transmission through antenna 37 of radio transceiver 35. The radio signal from antenna 37

is received wirelessly by antenna 52 of transceiver 39 providing feedback to primary controller 11. The primary controller 11 then uses the feedback control signal, such as to regulate a parameter of the charging process, a charging signal voltage, and/or a cycling rate, and thereby improving the efficiency of the overall charging process and the energy transfer to the battery 21 (Fig. 3).

Kubota et al. (US 7208915) published 2007-04-24, foreign priority date 2004-09-30 disclosed constant current battery charger includes voltage monitor (Fig. 1).

Extensions of Time

Extensions of time under 37 CFR 1.136(a) will not be permitted in these proceedings because the provisions of 37 CFR 1.136 apply only to "an applicant" and not to parties in a reexamination proceeding. Additionally, 35 U.S.C. 305 requires that *ex parte* reexamination proceedings "will be conducted with special dispatch" (37 CFR 1.550(a)). Extensions of time in *ex parte* reexamination proceedings are provided for in 37 CFR 1.550(c).

Waiver of Right to File Patent Owner Statement

In a reexamination proceeding, Patent Owner may waive the right under 37 C.F.R. 1.530 to file a Patent Owner Statement. The document needs to contain a statement that Patent Owner waives the right under 37 C.F.R. 1.530 to file a Patent Owner Statement and proof of service in the manner provided by 37 C.F.R. 1.248, if the request for reexamination was made by a third party requester, see 37 C.F.R. 1.550(f). The Patent Owner may consider using the following statement in a document waiving the right to file a Patent Owner Statement:

Patent Owner waives the right under 37 C.F.R. 1.530 to file a Patent Owner Statement.

Amendment in Reexamination Proceedings

Patent owner is notified that any proposed amendment to the specification and/or claims in this reexamination proceeding must comply with 37 CFR 1.530(d)-(j), must be formally presented pursuant to 37 CFR § 1.52(a) and (b), and must contain any fees required by 37 CFR § 1.20(c). See MPEP § 2250(IV) for examples to assist in the preparation of proper proposed amendments in reexamination proceedings.

Submissions

If the patent owner fails to file a timely and appropriate response to any Office action or any written statement of an interview required under 37 CFR § 1.560(b), the *ex parte* reexamination proceeding will be terminated, and the Director will proceed to issue a certificate under 37 CFR § 1.570 in accordance with the last Office action.

Service of Papers

After the filing of a request for reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on the other party (or parties where two or more third party requester proceedings are merged) in the reexamination proceeding in the manner provided in 37 CFR 1.248. See 37 CFR 1.550(f).

Notification of Concurrent Proceedings

The patent owner is reminded of the continuing responsibility under 37 CFR 1.565(a) to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving Patent No. US 8,013,568B2 throughout the course of this reexamination proceeding. The third

party requester is also reminded of the ability to similarly apprise the Office of any such activity or proceeding throughout the course of this reexamination proceeding. See MPEP §§ 2207, 2282 and 2286.

All correspondence relating to this ex parte reexamination proceeding should be directed:

By Mail to: Mail Stop *Ex Parte* Reexam
 Central Reexamination Unit
 Commissioner for Patents
 United States Patent & Trademark Office
 P.O. Box 1450
 Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
 Central Reexamination Unit

By hand: Customer Service Window
 Randolph Building
 401 Dulany Street
 Alexandria, VA 22314

Any inquiry concerning this communication should be directed to the Central Reexamination Unit at telephone number (571) 272-7705.

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