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(71) Applicant: **APPLE INC.** [US/US]; 1 Infinite Loop, Cupertino, CA 95014 (US).

(72) Inventors: **HU, Ming**; c/o Apple Inc., 1 Infinite Loop, M/S 302-1IOS, Cupertino, California 95014 (US). **ZHANG, Haining**; c/o Apple Inc., 1 Infinite Loop, M/S 302-1IOS, Cupertino, California 95014 (US). **LIU, Xueting**; c/o Apple Inc., 1 Infinite Loop, M/S 302-1IOS, Cupertino, California 95014 (US).

(74) Agent: **SAHASRABUDDHE, Laxman**; Park, Vaughan, Fleming & Dowler LLP, 2820 Fifth Street, Davis, California 95618 (US).

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[Continued on next page]

(54) Title: FACILITATING SWITCHING BETWEEN TRANSMITTING ANTENNAS IN PORTABLE ELECTRONIC DEVICES

(57) Abstract: The disclosed embodiments provide a system that uses a first antenna and a second antenna in a portable electronic device. During operation, the system receives a request to switch from the first antenna to the second antenna to transmit a signal to a cellular receiver. Next, the system loads a set of radio-frequency (RF) calibration values for the second antenna. Finally, the system performs the switch from the first antenna to the second antenna to transmit the signal, wherein the second antenna is operated using the RF calibration values after the switch.

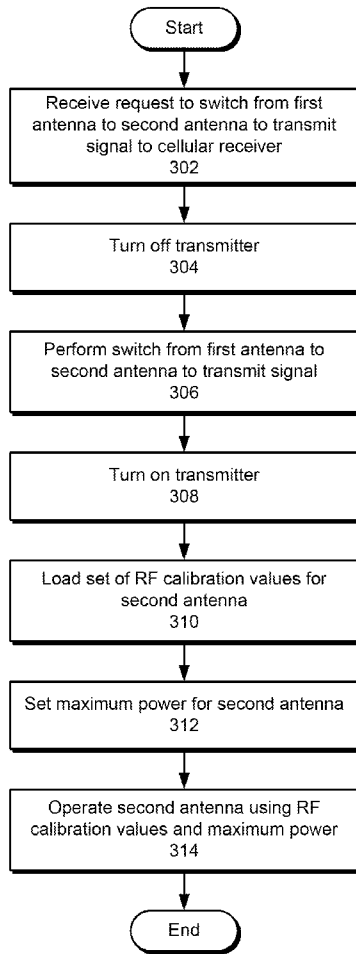


FIG. 3





BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No PCT/US2013/043810

A. CLASSIFICATION OF SUBJECT MATTER INV. H04B7/06 H04B17/00 H04B1/38 H01Q1/24 ADD.				
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) H04B H01Q				
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) EPO-Internal, WPI Data				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
Y	US 2012/062424 A1 (HWANG CHIEH-TSAO [TW]) 15 March 2012 (2012-03-15) abstract paragraphs [0005] - [0007], [0058] - [0069] figures 1, 4 -----	1-3, 6-10, 13-17, 20-22,25		
Y	US 2005/054383 A1 (WEBSTER MARK A [US] ET AL) 10 March 2005 (2005-03-10) paragraphs [0019], [0020], [0033] - [0035] figure 1 -----	1-3, 6-10, 13-17, 20-22,25		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> </tr> </table>			"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
"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			
2 August 2013	04/12/2013			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer HeImS, Jochen			

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/043810

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-3, 6-10, 13-17, 20-22, 25

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3, 6-10, 13-17, 20-22, 25

Independent claim 1 relates to a method for using a first antenna and a second antenna in a portable electronic device, comprising: receiving a request to switch from the first antenna to the second antenna to transmit a signal to a cellular receiver; loading a set of radio-frequency (RF) calibration values for the second antenna; and performing the switch from the first antenna to the second antenna to transmit the signal, wherein the second antenna is operated using the RF calibration values after the switch. Independent claims 8, 15 and 22 correspond to claim 1. Claims 2, 9 and 16 depending on claims 1, 8 and 15, respectively, further comprises setting a maximum power for the second antenna, wherein the second antenna is further operated using the maximum power after the switch.

1.1. claims: 6, 13, 20

The first and second antennas comprise a primary antenna and a secondary antenna.

1.2. claims: 7, 14, 21

The portable electronic device is at least one of a mobile phone and a tablet computer.

2. claims: 4, 11, 18, 23

Turning off a transmitter for the first and second antennas prior to performing the switch and turning on the transmitter after the switch is performed.

3. claims: 5, 12, 19, 24

The set of RF calibration values comprises at least one of a frequency offset, a transmitter gain index versus power, and a power detector value versus power.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/043810

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2012062424 A1	15-03-2012	CN 102570051 A	11-07-2012
		DE 102011112905 A1	15-03-2012
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