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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, 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,

[Continued on next page]

(54) **Title:** IMPROVING CONNECTION SETUP FOR LOW ENERGY WIRELESS NETWORKS BASED ON SCAN WINDOW AND SCAN INTERVAL ESTIMATION

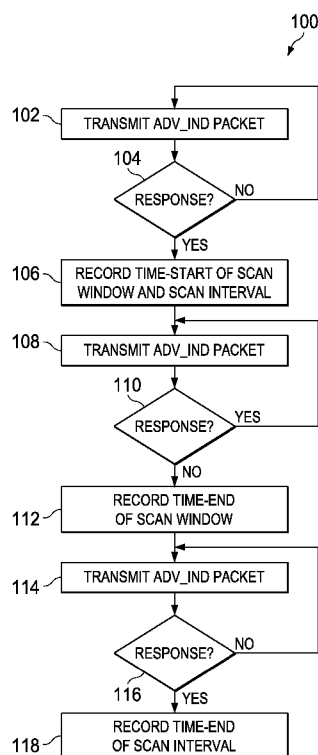


FIG. 5

(57) **Abstract:** Various techniques for connection setup for Bluetooth Low Energy (BLE) devices are disclosed. The various embodiments save power. In one example, an apparatus (such as a BLE slave) includes a controller (22) configured to transmit advertising packets (102, 108, 114) and, based on responses to the packets, and lack thereof, the controller (22) estimates the length of a scan window (112) and scan interval (118). In another embodiment, an apparatus such as a master device is configured to generate a scan update packet that specifies the scan window length, scan interval, and start and end times for that master. The controller is configured to transmit the packet to one or more slave devices.



HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, 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, 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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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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A. CLASSIFICATION OF SUBJECT MATTER***H04W 52/02(2009.01)i, H04W 84/20(2009.01)i***

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)

H04W 52/02; G06F 15/16; G06F 15/173; H04J 15/00; H04L 12/28

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: advertisement, response, window length

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011-0153818 A1 (PIERRE VANDWALLE et al.) 23 June 2011 See paragraphs [0007], [0054], [0071].	1-20
A	US 2008-0019287 A1 (JIN-WOO HONG) 24 January 2008 See paragraphs [0020]-[0022].	1-20
A	US 2005-0177639 A1 (JUKKA REUNAMAKI et al.) 11 August 2005 See paragraphs [0053], [0054], [0057]-[0059].	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

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"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

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

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