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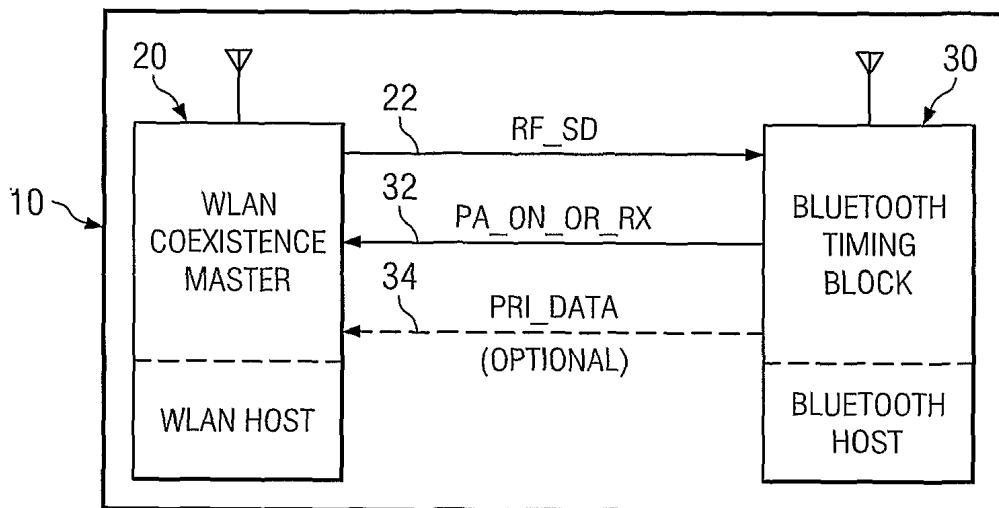
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[Continued on next page]

(54) Title: COEXISTENT BLUETOOTH AND WIRELESS LOCAL AREA NETWORKS IN A MULTIMODE TERMINAL AND METHOD THEREOF



(57) Abstract: The present invention generally to a multimode terminal (10) including a wireless local area network (WLAN) system (20) and a Bluetooth system (30) that avoids radio interference between the two systems by collaborative coexistence methods that include time -sharing, combined frequency and time -sharing, and forward-looking combined frequency and time-sharing between the WLAN system and the Bluetooth system. The coexistent multimode terminal and the method of coexistence provide WLAN transmissions/receptions that are not impacted when there is no Bluetooth traffic, Bluetooth transmissions/receptions that are not impacted when there is no WLAN traffic, Bluetooth and WLAN transmissions/ receptions that are provided fair access to the medium when both Bluetooth and WLAN traffic are present, and high priority Bluetooth traffic, for example, voice traffic, that has priority over non-high priority WLAN traffic.

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RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Declarations under Rule 4.17:**

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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— *with international search report*

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## INTERNATIONAL SEARCH REPORT

International application No.

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<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) 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) QWeb, IEEE & Internet and Keywords used: WLAN, Bluetooth, interference, co-existence, multimode, timing, shut-down, address match, frequency hopping and similar words		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2004/0029619 A1 (LIANG et al.) 12 February 2004 Paragraphs [0028] – [0038]	1 – 13 14 – 27
A	OPHIR, L., et al., " <i>Wi-Fi (IEEE 802.11) and Bluetooth coexistence: issues and solutions</i> ", Personal, Indoor and Mobile Radio Communications, 2004. PIMRC 2004. 15 <sup>th</sup> IEEE International Symposium on, Vol. 2, pp: 847 – 852, ISBN: 0-7803-8523-3, INSPEC Accession Number: 8221621, 5 – 8 September 2004 Whole Document	1 – 27
A	US 2004/0137849 A1 (KLOPER et al.) 15 July 2004 Whole Document	1 – 27
A	WO 2003/105418 A2 (KONINKLIJKE PHILIPS ELECTRONICS N.V) 18 December 2003 Whole Document	1 – 27
<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: "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 29 October 2007	Date of mailing of the international search report 12 FEB 2008	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver Helpdesk: 571-272-4300 PCT OSP: 571-272-7774	

## INTERNATIONAL SEARCH REPORT

Information on patent family members

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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. These particulars are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	2004029619	EP	1388951				
US	2004137849	AU	2003223468	AU	2003225262	AU	2003228794
		AU	2003234166	AU	2003291065	AU	2003294416
		CN	1663156	EP	1502369	US	6714605
		US	6850735	US	6941110	US	7006838
		US	7035593	US	7079812	US	7110756
		US	7116943	US	7171161	US	7184777
		US	7224752	US	7254191	US	7269151
		US	2003198200	US	2003198304	US	2003224741
		US	2004023674	US	2004028003	US	2004028123
		US	2004047324	US	2004102198	US	2004137915
		US	2004156440	US	2004203474	US	2004203826
		US	2004219885	US	2005002473	US	2005003828
		US	2005032479	US	2005073983	US	2005227625
		US	2006274684	WO	03088626	WO	03090037
		WO	03090376	WO	03090387	WO	2004051868
		WO	2004052027	WO	2004066544	WO	2004095758
WO	2005094309	WO	2006020405				
WO	20030105418	AU	2003259388	CN	1659827	EP	1514382
		US	2005170776				
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