

(12) 按照专利合作条约所公布的国际申请

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国际局

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- (25) 申请语言: 中文
- (26) 公布语言: 中文
- (71) 申请人 (对除美国外的所有指定国): 华为技术有限公司 (HUAWEI TECHNOLOGIES CO., LTD.) [CN/CN]; 中国广东省深圳市龙岗区坂田华为总部办公楼, Guangdong 518129 (CN)。
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- (81) 指定国 (除另有指明, 要求每一种可提供的国家保护): 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, 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。
- (84) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), 欧洲 (AL, AT, BE, BG, CH, CY, CZ, DE, DK, 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, ML, MR, NE, SN, TD, TG)。

[见续页]

(54) Title: ANTENNA, BASE STATION AND BEAM PROCESSING METHOD

(54) 发明名称: 天线、基站及波束处理方法

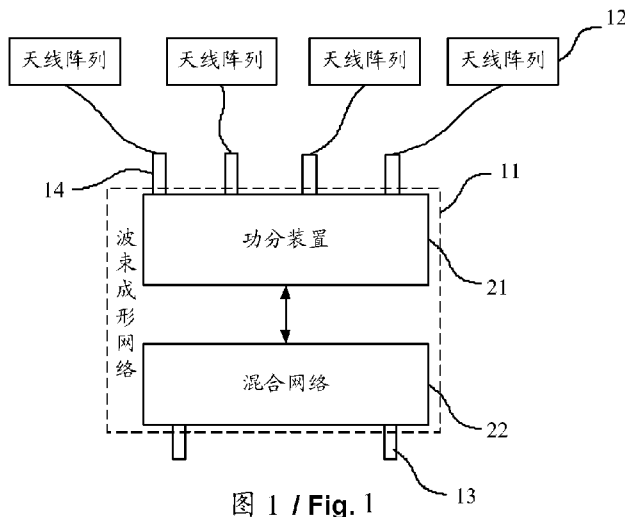


图 1 / Fig. 1

- 11 FORMING BEAM INTO NETWORK
- 12 ANTENNA ARRAY
- 21 POWER DIVISION DEVICE
- 22 HYBRID NETWORK

(57) Abstract: Disclosed are an antenna, a base station and a beam processing method, said method comprising: a hybrid network performing phase modulation on a signal received from a base transceiver station, generating and sending to a power splitter a signal having a preset phase; the power splitter performing amplitude modulation on the signal and sending to multiple antenna arrays a multi-channel signal having an array amplitude and a preset phase; the multiple antenna arrays transmitting the multi-channel signal, said multi-channel signal having an array phase and said array amplitude; within the multi-channel signal, the array phase and preset phase of each single channel signal being identical; alternatively, the array phase and the preset phase of at least one of the single channel signals being opposite one to the other. The present invention reduces the complexity and cost of forming a beam into a network.

(57) 摘要: 本发明提供一种天线、基站及波束处理方法, 其中方法包括: 混合网络对从基站收发信机接收的信号进行相位调节, 生成具有预设相位的信号发送至功分装置; 功分装置对信号进行幅度调节, 并输出具有阵列幅度和预设相位的多路信号输出至多个天线阵列; 多个天线阵列将所述多路信号发射出去, 所述多路信号具有阵列相位和所述阵列幅度; 所述多路信号中, 每一路信号的阵列相位和预设相位相同, 或者, 至少有一路信号的阵列相位和预设相位相反。本发明降低了波束成形网络的复杂度和成本。

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本国际公布:

- 包括国际检索报告(条约第 21 条(3))。
- 在修改权利要求的期限届满之前进行, 在收到该修改后将重新公布(细则 48.2(h))。
- 根据申请人的请求, 在条约第 21 条(2)(a)所规定的期限届满之前进行。

(88) **国际检索报告公布日期:** 2013 年 3 月 7 日

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/074445

A. CLASSIFICATION OF SUBJECT MATTER

H04B 7/04 (2006.01) 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)

IPC: H04B 7/-

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)

CPRSABS; CNTXT; CNKI: antenna array phase amplitude base station receive transmit electrical bridge power divider phase shifter beamforming feed inverse phase

VEN: antenna array amplitude phase base station receive transmit electrical bridge power divider phase shifter beamforming feed inverse phase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 1921341 A (COMBA TELECOM TECHNOLOGY (GUANGZHOU) CO., LTD.), 28 February 2007 (28.02.2007), description, page 1, line 17 to page 2, line 6, page 2, line 16 to page 3, line 23, and page 4, lines 12-31, and figures 1 and 5	1-3, 5-6, 8-14
A	The whole description	4, 7
A	CN 1220787 A (TELEFON AB L.M. ERICSSON), 23 June 1999 (23.06.1999), the whole description	1-14
A	CN 201378631 Y (CHENGDU JIUZHOU ELECTRONIC INFORMATION SYSTEM CO., LTD.), 06 January 2010 (06.01.2010), the whole description	1-14

Further documents are listed in the continuation of Box C.

See patent family annex.

<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“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)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p>	<p>“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</p> <p>“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</p> <p>“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</p> <p>“&” document member of the same patent family</p>
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Date of the actual completion of the international search 31 December 2012 (31.12.2012)	Date of mailing of the international search report 17 January 2013 (17.01.2013)
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer LING, Lin Telephone No.: (86-10) 62411401

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2012/074445

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 1921341 A	28.02.2007	CN 100512044 C	08.07.2009
CN 1220787 A	23.06.1999	AU 727141 B2	07.12.2000
		EP 0903018 A1	24.03.1999
		MX 9810030 A1	01.03.1999
		IN 9701225 I1	23.02.2007
		BR 9709488 A	10.08.1999
		JP 2000511370 T	29.08.2000
		CA 2255845 C	21.02.2006
		DE 69737932 T2	06.12.2007
		TW 358268 A	11.05.1999
		MX 207828 B	16.05.2002
		IN 212650 B	21.12.2007
		CN 1104105 C	26.03.2003
		DE 69737932 D1	30.08.2007
		AU 3053597 A	05.01.1998
		EP 0903018 B1	18.07.2007
		WO 9745968 A1	04.12.1997
		CA 2255845 A1	04.12.1997
CN 201378631 Y	06.01.2010	None	

A. 主题的分类		
H04B7/04(2006.01)i		
按照国际专利分类(IPC)或者同时按照国家分类和 IPC 两种分类		
B. 检索领域		
检索的最低限度文献(标明分类系统和分类号)		
IPC: H04B7/-		
包含在检索领域中的除最低限度文献以外的检索文献		
在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))		
CPRSABS; CNTXT; CNKI: 天线阵列 相位 幅度 基站 接收 发射 电桥 功分器 移相器 波束成形 馈电 反相		
VEN: antenna array amplitude phase base station receive transmit electrical bridge power divider phase shifter beamforming feed inverse phase		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
X	CN1921341A (京信通信技术(广州)有限公司) 28.2月 2007(28.02.2007) 说明书第1页第17行至第2页第6行, 第2页第16行至第3页第23行, 第4页第12行至第31行, 图1、5	1-3,5-6,8-14
A	说明书全文	4,7
A	CN1220787A (艾利森电话股份有限公司) 23.6月 1999(23.06.1999) 说明书全文	1-14
A	CN201378631Y (成都九洲电子信息系统有限责任公司) 06.1月 2010(06.01.2010) 说明书全文	1-14
<input type="checkbox"/> 其余文件在 C 栏的续页中列出。 <input checked="" type="checkbox"/> 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件(如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件		“T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件
国际检索实际完成的日期 31.12月 2012(31.12.2012)		国际检索报告邮寄日期 17.1月 2013 (17.01.2013)
ISA/CN 的名称和邮寄地址: 中华人民共和国国家知识产权局 中国北京市海淀区蓟门桥西土城路6号 100088 传真号: (86-10)62019451		受权官员 <p style="text-align: center;">凌林</p> 电话号码: (86-10) 62411401

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2012/074445

检索报告中引用的 专利文件	公布日期	同族专利	公布日期
CN1921341A	28.02.2007	CN100512044C	08.07.2009
CN1220787A	23.06.1999	AU727141B2	07.12.2000
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CN201378631Y	06.01.2010	无	