Title: METHOD AND APPARATUS FOR CONTROLLING THE INTERFERENCE BETWEEN A MICROCELL AND A MACROCELL

Abstract: A method and an apparatus for controlling interference between a microcell and a macrocell in a home base station within the microcell are provided in the present invention. In particular, in the case that the existence of at least one victim macro user equipment is detected, the home base station according to the present invention controls its transmit power within an interval determined by an upper limit and a lower limit, such that it can be guaranteed that the performance requirement of a communication with the home user equipment is satisfied while lac interference toward the victim macro user equipment is reduced. Additionally, the home base station according to the present invention detects whether there is at least one indoor victim macro user equipment, and conducts corresponding interference control according to the detection result.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet
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: H04W

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)

CNABS; CNTXT; CNKI; VEN; 3GPP: macrocell, macro cell, macro-cell, microcell, micro cell, micro-cell, femtocell, femto cell, femto-cell, macronode, macro node, macro-node, micronode, micro node, micro-node, home base station, indoor base station, HNB, HeNB, interference, power, transmission power, loss, pathloss, indoor, median, max+, min+, detect, determine, judge, control, reduce

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>CN101895924A (HUAWEI TECHNOLOGIES CO., LTD.) 24 Nov. 2010(24.11.2010) the whole document</td>
<td>1-17</td>
</tr>
<tr>
<td>A</td>
<td>CN101925069A (NTT DOCOMO INC.) 22 Dec. 2010(22.12.2010) the whole document</td>
<td>1-17</td>
</tr>
<tr>
<td>A</td>
<td>CN101133675A (NOKIA SIEMENS NETWORK CO.) 27 Feb. 2008(27.02.2008) the whole document</td>
<td>1-17</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C. 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
23 July 2012(23.07.2012)

Date of mailing of the international search report
30 Aug. 2012 (30.08.2012)

Name and mailing address of the ISA/CN
The State Intellectual Property Office, the P.R.China
6-Xitucheng Rd., Jimen Bridge; Haidian District, Beijing, China 100088.
Facsimile No. 86-10-62019451

Authorized officer
WANG, Sizhen
Telephone No. (86-10)62412033

Form PCT/ISA /210 (second sheet) (July 2009)
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).

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

1. claim 1, claim 13
2. claim 14, claim 17

(see the extra 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 fee.

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.:

**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.
Continuation of : A. CLASSIFICATION OF SUBJECT MATTER

H04W24/00 (2009.01) i
H04W52/04 (2009.01) i

Continuation of : Box No. III Observations where unity of invention is lacking

In these groups of claims, the common or corresponding technical features are: "a microcell", "a first base station within the microcell", "a macrocell", "a second base station within the macrocell" and "controlling the interference". However these features are the common knowledge in the art. Therefore, the common or corresponding special technical features are not included in these groups of claims. The inventions are not so linked as to form a single general inventive concept, as required by PCT Rule 13.1.
<table>
<thead>
<tr>
<th>Patent Documents referred in the Report</th>
<th>Publication Date</th>
<th>Patent Family</th>
<th>Publication Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>JP2010288282A</td>
<td>24.12.2010</td>
</tr>
<tr>
<td>CN101133675A</td>
<td>27.02.2008</td>
<td>JP2008529375T</td>
<td>31.07.2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US2006165032A1</td>
<td>27.07.2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO2006079689A1</td>
<td>03.08.2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IN200705579P1</td>
<td>17.08.2007</td>
</tr>
</tbody>
</table>