(51) International Patent Classification: H04L 1/00, H04B 7/005

(21) International Application Number: PCT/US2003/014079

(22) International Filing Date: 6 May 2003 (06.05.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/140,352 6 May 2002 (06.05.2002) US

(71) Applicant: QUALCOMM, INC. [US/US]; 5775 Morehouse Drive, San Diego, CA 92121 (US).

(72) Inventors: WILLENTEGER, Serge; Vignes-Dessous, CH-1425 Omnens (CH); CHEN, Tao; 5415 Harvest Run Drive, San Diego, CA 92130 (US); VAYANOS, Alkinos; Hector; 1037 Diamond Street, San Diego, CA 92109 (US); WEI, Yongbin; 12140 Brickellia Street, San Diego, CA 92129 (US).


Published: with international search report — before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: FRAME FORMATTING, CODING AND TRANSMIT POWER CONTROL METHOD FOR A MULTICAST/BROADCAST SYSTEM

(57) Abstract: Techniques to implement MBMS services in a wireless communication system. In one aspect, a method is provided for processing data for transmission to a plurality of terminals. Frames of information bits (which may have variable rates) are provided to a buffer implementing a matrix. The matrix is padded with padding bits based on a particular padding scheme to support various frame rates. The frames are then coded based on a particular block code to provide parity bits. The frame of information bits and the parity bits are then transmitted to the terminals. In another aspect, a method is provided for controlling the transmit power of a data transmission to a plurality of terminals. In accordance with the method, TPC streams are received from the terminals and processed to obtain a stream of joint power control commands used to adjust the transmit power of the data transmission.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L1/00 H04B7/005

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04B

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

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>
</table>

X Further documents are listed in the continuation of box C. X Patent family members are listed in 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 document 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

Date of the actual completion of the international search

13 May 2004

Name and mailing address of the ISA

European Patent Office, P.B. 5018 Patentiesen 2 NL - 2280 HV Rijswijk, Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016

Authorized officer

Reilly, D

Date of mailing of the international search report

17 JUN 2004

Form PCT/ISA2/10 (second sheet) (January 2004)
<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>WO 00/77948 A (NORTEL NETWORKS LTD) 21 December 2000 (2000-12-21) abstract claims 1,2</td>
<td>16-25, 35</td>
</tr>
<tr>
<td>A</td>
<td>EP 1 067 704 A (LUCENT TECHNOLOGIES INC) 10 January 2001 (2001-01-10) abstract paragraph '0003!' - paragraph '0004!' paragraph '0009!' - paragraph '0010!' claims 1,2</td>
<td>16-25, 35</td>
</tr>
</tbody>
</table>
INTERNATIONAL SEARCH REPORT

Box I  Observations where certain claims were found unsearchable (Continuation of item 1 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 II  Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any 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.

☒ No protest accompanied the payment of additional search fees.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

   Frame formatting in a multicast/broadcast system.

2. Claims: 16-25, 35
   Transmit power control in a multicast/broadcast system.
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AU 4943500 A</td>
<td>02-01-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AU 5096200 A</td>
<td>02-01-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 0078069 A1</td>
<td>21-12-2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 0077948 A1</td>
<td>21-12-2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AU 4266300 A</td>
<td>11-01-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BR 0003603 A</td>
<td>13-03-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA 2313167 A1</td>
<td>08-01-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CN 1280425 A</td>
<td>17-01-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1067704 A2</td>
<td>10-01-2001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2001069077 A</td>
<td>16-03-2001</td>
</tr>
</tbody>
</table>