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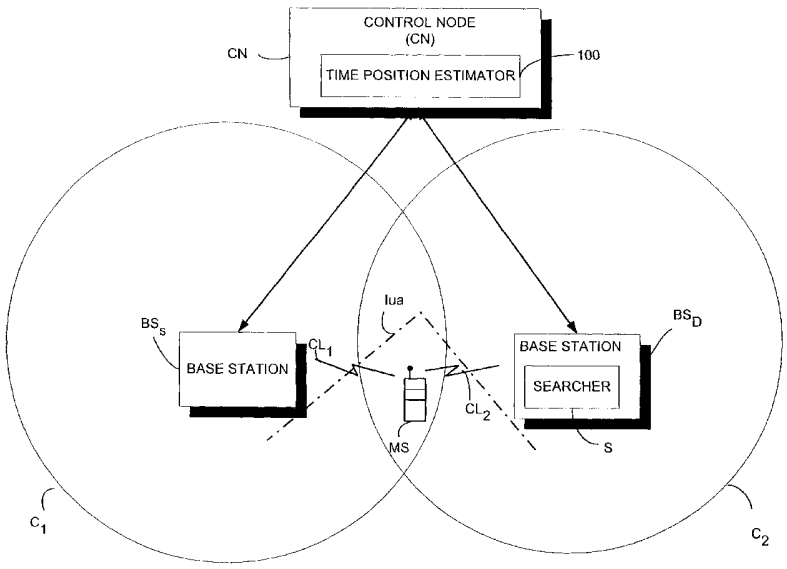
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Published:
— *with international search report*

[Continued on next page]

(54) Title: USING STATISTICALLY ASCERTAINED POSITION FOR STARTING SYNCHRONIZATION SEARCHER DURING DIVERSITY HANDOVER



(57) Abstract: A code division multiple access communication system comprises a source base station (BS_S), a destination base station ($BS_¿D$) having a synchronization searcher (S), and a time position estimator (100) which establishes a start position of a synchronization search window for the synchronization searcher of the destination station. In accordance with an aspect of the present invention, the time position estimator establishes the start position (SP) of the synchronization search window based on a statistical estimate of the time position at which other mobile stations previously initiated handover from the source base station to the destination base station. In a non-limiting example embodiment, the time position estimator ueses an average time position (T_{new}) at which other mobile sations previously initiated handover from the source base station to the destination base station as the statistical estimate. In an example illustrated embodiment, the time position estimator is situated at a radio network control node (26) of the code division multiple access communication system, but can be located at other nodes. In another aspect of the invention, the time position estimator maintains a table (110) which, for each of plural scenarios of source base stations and destination base stations, stores a corresponding scenario-specific start time position. In accordance with yet another aspect of the present invention, if the mobile station is not found at the start time position, the synchronization searcher attempts to find the transmission of the mobile station by looking at one or more search window positions which neighbor the start time position.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
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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

In al Application No
PCT/SE 01/02685

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/32

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 7 H04Q

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 790 589 A (HUTCHISON J A IV ET AL) 4 August 1998 (1998-08-04) column 3, line 38 -column 4, line 32 abstract	26-29
A		6-9, 16-19

A	WO 99 23847 A (MOTOROLA INC) 14 May 1999 (1999-05-14) abstract	1-25,30

A	WO 00 51393 A (QUALCOMM INC) 31 August 2000 (2000-08-31) abstract	1-25,30

P,A	WO 01 17125 A (QUALCOMM INC) 8 March 2001 (2001-03-08) abstract	1-25,30

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[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

"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	Date of mailing of the international search report
14 August 2002	25. 09. 2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Ann Börjeson

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/SE 01/02685

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	IIGYU K ET AL: "Performance analysis of uplink handover searcher in asynchronous WCDMA system." IEEE ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE 2001, 2001, pages 286-290, XP002902476 ISBN: 0-7803-7005-8 abstract	1-25,30
A	US 5 152 012 A (SCHWOB PIERRE R) 29 September 1992 (1992-09-29) column 17, line 7 - line 13	26-29

INTERNATIONAL SEARCH REPORT

ıtional application No.
PCT/SE 01/02685

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

As a result of the prior review under R. 40.2(e) PCT, part of the additional fees are to be refunded.

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-25,30

The first group of inventions solves the problem of finding a start position for a search window in a destination base station, when trying to detect a transmission of a mobile station during a soft handoff from a source base station to the destination base station. The solution to the problem is to define the start position as a statistically-ascertained time position based on time positions at which other mobile stations previously initiated handoff from the source base station to the destination base station.

2. Claims: 26-29

The second group of inventions solves the problem of finding a new start position for a search window in a destination base station, when the transmission of a sought after mobile station was not found in the first search window. The solution to the problem is to look for a new search window position, which neighbours the start time position.

INTERNATIONAL SEARCH REPORT

In al Application No
PCT/SE 01/02685

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