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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 1 of 2

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Express Mail Label No. Transmitted Via EFS-Web

INVENTOR(S)		
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Additional inventors are being named on the _____ separately numbered sheets attached hereto

TITLE OF THE INVENTION (500 characters max):

Method and Arrangement in a Telecommunication System

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

☒ The address corresponding to Customer Number: 27045

OR

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ENCLOSED APPLICATION PARTS (check all that apply)

☐ Application Data Sheet, See 37 CFR 1.76 ☐ CD(s), Number of CDs _____

☒ Drawing(s) Number of Sheets 1 ☐ Other (specify) _____

☒ Specification (e.g. description of the invention) Number of Pages 5

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PTO/SB/16 (10-07)

Approved for use through 06/30/2010. OMB 0651-0032

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SIGNATURE Roger S. Burligh Date December 20, 2007

TYPED or PRINTED NAME Roger S. Burligh REGISTRATION NO. 40,542
(if appropriate)

TELEPHONE 972-583-5799 Docket Number: P25336-US1

Method and Arrangement in a Telecommunication System

FIELD OF THE INVENTION

The present invention relates to a method and arrangement in a telecommunication system, in particular to a method and
5 arrangement for a fast and reliable release of common E-DCH resources.

BACKGROUND

In 3GPP Rel-8, work is ongoing to improve the uplink performance in CELL_FACH state. CELL_FACH is an RRC state in which the UE is
10 known on cell level (i.e. has a cell id), has a layer 2 connection but no dedicated physical layer resource. Instead, common physical layer resources are shared between users in CELL_FACH state. The uplink improvement planned for Rel-8 is the activation also in CELL_FACH of the E-DCH physical channel, which is normally used as
15 a dedicated physical layer channel in CELL_DCH state, with one separate E-DCH resource allocated per user. This is performed by having a pool of E-DCH resources that can be temporarily assigned to a user in CELL_FACH state. These resources are called common E-DCH resources. E-DCH resources are normally managed by a RNC
20 (Radio Network Controller), but the pool of common E-DCH resources will be managed by NodeB without involving the RNC, in order to speed up the allocation. The common E-DCH configurations are broadcast to UEs in the cell.

The procedure to access the common E-DCH channel in CELL_FACH
25 starts in the same way as Rel-99 RACH transmission, i.e. with preamble power ramping using randomly selected preamble signatures. Having detected the preamble, the NodeB acknowledges

reception with an AICH sequence. It also informs the UE which common E-DCH resource it has assigned to the UE.

A common E-DCH resource is defined as

- 5 - UL scrambling code
- E-RNTI
- F-DPCH code and timing offset
- E-AGCH/E-RGCH/E-HICH codes and signatures
- HS-DPCCH parameters (power offsets, CQI)

10 In existing solutions the set of common E-DCH resources available in each cell are limited. It is not possible to indicate an unlimited number of configurations in the AICH response and also NodeB and air interface resources need to be reserved for each common E-DCH resource. Thus, it is preferable if each UE releases the common E-DCH resource as quickly as possible after completed
15 transmission.

It could also in some error cases be beneficial for the NodeB to have a mechanism to release common E-DCH configurations, for use by a new user.

20 The purpose of this invention is to provide fast and effective means of signaling the release of common E-DCH resources between UE and NodeB

SUMMARY

25 It has been observed to be a problem that, since the set of common E-DCH resources available in each cell are limited, situations will occur when UEs needing common E-DCH resources, could not be assigned these, due to lack of free resources. One reason for the lack of resources has shown to be that UEs are keeping the assigned common E-DCH resources for a longer time period than

needed, this due to lack of an reliable and fast release procedure.

It is a first object of the present invention to achieve a method and arrangement that allows a user equipment to release the common
5 E-DCH resources in a fast and reliable manner.

It is another object of the present invention to achive a method and arrangement for a nodeB to release common E-DCH resources.

Briefly, these and other objects of the present invention are accomplished by a method and arrangement where the messages for
10 release of the common E-DCH resources is signaled between UE and NodeB using existing signaling fields on Layer 2 (L2) or Layer 1 (L1). These signaling fields are already in use in CELL_DCH, but their interpretation is changed for users in CELL_FACH.

As an advantage, the present invention shows that a fast and
15 reliable release of common E-DCH resources, increases the E-DCH capacity in CELL_FACH.

Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying
20 drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding, reference is made to the following drawings and preferred embodiments of the invention.

Figure 1 A diagram over common E-DCH transmission in CELL_FACH
25 state

DETAILED DESCRIPTION

The release of the common E-DCH resources is signaled between UE and NodeB using existing signaling fields on L2 or L1. These signaling fields are already in use in CELL_DCH, but their
5 interpretation is changed for users in CELL_FACH.

UE triggered resource release

Once a UE in CELL_FACH transmitting on a common E-DCH resource has
10 emptied its RLC transmit buffer, it shall include the Scheduling Information (SI) field in the last MAC PDU, indicating Total E-DCH Buffer Status (TEBS)= 0. For users in CELL_FACH, the NodeB will interpret this as the UE has finished transmission, and will release the common E-DCH resource, once all HARQ processes have
15 finished. Note that even when the HARQ process carrying the last MAC PDU with the SI field have completed, there may still be previous HARQ processes that have not yet completed. The NodeB shall release the common E-DCH resource, making it available for use by other users, once all HARQ processes have finished or when
20 the reordering timer T1 have expired for the last MAC PDU.

In another embodiment, the E-TFCI or "Happy bit" on the physical layer control channel E-DPCCH is used to indicate release of the common E-DCH resource. These could however be more error prone, and could be used either as the only indication for common E-DCH
25 resource release or in combination with the SI field in the MAC PDU.

The UE shall not release the common E-DCH resources until it has received an ACK for all HARQ processes, or reached the maximum

number of HARQ transmissions. Once the UE has transmitted the E-DCH resource release indication, and new data is received from higher layer to be transmitted, the UE shall start by transmitting preambles to request a new common E-DCH resource.

5 *NodeB triggered resource release*

To cover for error cases, like signaling errors or UEs moving out of coverage, the NodeB can also use a release timer to release the common E-DCH resource. For example, the release timer can be started when the common E-DCH resource is assigned to a UE. Once
 10 UL transmission has been detected, the timer is stopped. Detection of UL transmission could for example be based on thresholds for the estimated BER or SNR of the UL DPCCH channel. If the UL (DPCCH) is lost during transmission, due to e.g. user moving out of coverage, the timer is again started. If UL (DPCCH) is not
 15 detected from the user until the release timer expires, the common E-DCH resource is released in NodeB for use by other UEs.

The NodeB may also have the option to stop a UE from transmitting on a common E-DCH resource by sending a grant on E-AGCH with the primary E-RNTI, indicating INACTIVE on all HARQ processes. This
 20 shall be interpreted by the UE as a signal to release the common E-DCH resource. This shall apply to both 2 and 10 ms TTI for users in CELL_FACH.

The present invention may, of course, be carried out in other ways than those specifically set forth herein without departing
 25 from essential characteristics of the invention. The present embodiments are to be considered in all respects as illustrative and not restrictive.

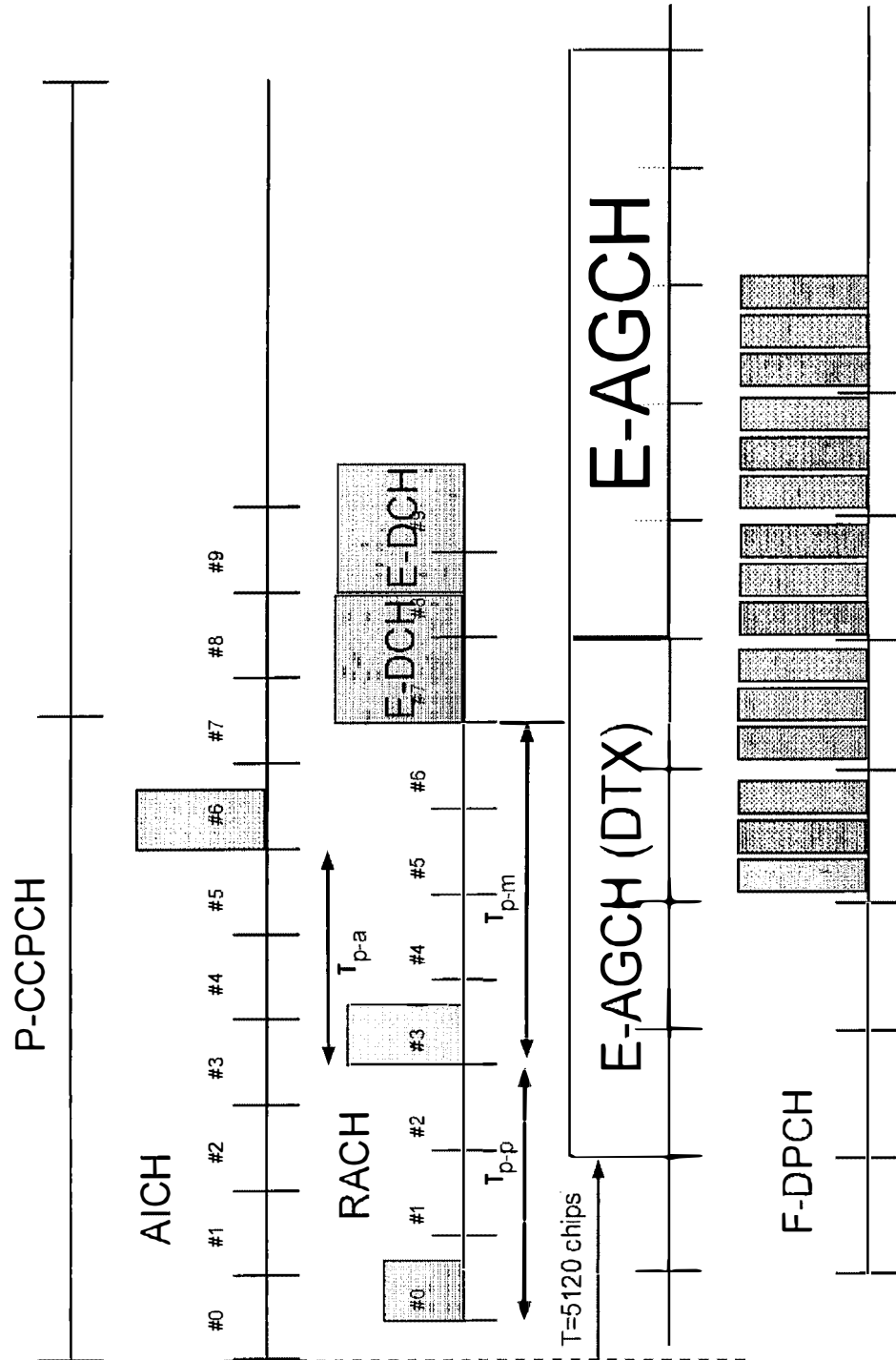


Fig. 1

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Method and Arrangement in a Telecommunication System		
First Named Inventor/Applicant Name:		Stefan Henrik Andreas Wager		
Filer:		Steven Ware Smith/Pamela Shultz		
Attorney Docket Number:		P25336-US1		
Filed as Large Entity				
Provisional Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Provisional application filing	1005	1	210	210
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
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Total in USD (\$)				210

Electronic Acknowledgement Receipt

EFS ID:	2621304
Application Number:	61015316
International Application Number:	
Confirmation Number:	5574
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First Named Inventor/Applicant Name:	Stefan Henrik Andreas Wager
Customer Number:	27045
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Application Type:	Provisional

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Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1		P25336-US1_2007-12-20_07-1299_Provisional_Application.pdf	417570 b75405ab106357446d09fad21cf5f7671fb42aaf	yes	8
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Provisional Cover Sheet (SB16)		1	2	
	Specification		3	7	
	Drawings-only black and white line drawings		8	8	

Warnings:

Information:

2	Fee Worksheet (PTO-06)	fee-info.pdf	8131 cc4c6c9b976ed726c6ef5d9cd70e1d12ca307991	no	2
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APPLICATION NUMBER	FILING or 371(c) DATE	GRPART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
61/015,316	12/20/2007		210	P25336-US1		

CONFIRMATION NO. 5574

27045
ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR 1-C-11
PLANO, TX 75024

FILING RECEIPT



OC00000027538218

Date Mailed: 01/07/2008

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Power of Attorney:

Roger Burleigh--40542

If Required, Foreign Filing License Granted: 01/03/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/015,316**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

Title

Method and Arrangement in a Telecommunication System

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