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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4015-6942 / P30138-US2
	Application Number	
Title of Invention	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
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Applicant Information:

Applicant 1

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Title of Invention	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced	

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All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

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☐ **An Address is being provided for the correspondence Information of this application.**

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Application Information:

Title of the Invention	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced		
Attorney Docket Number	4015-6942 / P30138-US2	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	12	Suggested Figure for Publication (if any)	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61/248661	2009-10-05

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

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This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

			Remove
Application Number	Country[1]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			◉ Yes ○ No

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Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	David Rennett	Date (YYYY-MM-DD)	2010-10-04

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	Application Number	
Title of Invention	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced	

First Name	David	Last Name	Bennett	Registration Number	32194

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

PUCCH RESOURCE ALLOCATION FOR CARRIER AGGREGATION IN LTE-ADVANCED

RELATED APPLICATION

[001] This application claims the benefit of U.S. Provisional Patent Application 61/248,661 filed October 5, 2009, which is incorporated herein by reference.

TECHNICAL FIELD

[002] The present invention relates generally to carrier aggregation in a mobile communication system and, more particularly, to an efficient resource allocation for the physical uplink control channel for carrier aggregation.

BACKGROUND

[003] Carrier aggregation is one of the new features being discussed for the next generation of Long Term Evolution (LTE) systems, which is being standardized as part of LTE Release 10 (known as LTE-Advanced). LTE Rel 8 currently supports bandwidths up to 20 MHz. In LTE-Advanced, bandwidths up to 100 MHz will be supported. The very high data rates contemplated for LTE-Advanced will require an expansion of the transmission bandwidth. In order to maintain backward compatibility with LTE Rel-8 user terminals, the available spectrum is divided into Rel-8 compatible chunks called component carriers. Carrier aggregation enables the needed bandwidth expansion by allowing user terminals to transmit data over multiple component carriers comprising up to 100 MHz of spectrum. Carrier aggregation also ensures efficient use of a wide carrier for legacy terminals by making it possible for legacy terminals to be scheduled in all parts of the wideband LTE-Advanced carrier.

[004] The number of aggregated component carriers, as well as the bandwidth of the individual component carrier, may be different for Uplink (UL) and Downlink (DL). A

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symmetric configuration refers to the case where the number of component carriers in downlink and uplink is the same. An asymmetric configuration refers to the case where the number of component carriers is different. The number of component carriers configured for a geographic cell area may be different from the number of component carriers seen by a terminal. A user terminal, for example, may support more downlink component carriers than uplink component carriers, even though in the geographic cell area the same number of uplink and downlink component carriers is offered by the network.

[005] One consideration for carrier aggregation is how to transmit control signaling from the user terminal on the uplink from the user terminal. Uplink control signaling may include acknowledgement (ACK) signaling for hybrid automatic repeat request (HARQ) protocols, channel state and quality information (CSI, CQI) reporting for downlink scheduling, and scheduling requests (SRs) indicating that the user terminal needs uplink resources for uplink data transmissions. One solution is to transmit the uplink control information on multiple uplink component carriers associated with different downlink component carriers. However, this option is likely to result in higher user terminal power consumption and a dependency on specific user terminal capabilities. It may also create implementation issues due to inter-modulation products, and may lead to generally higher complexity for implementation and testing.

SUMMARY

[006] The invention provides a signaling mechanism for efficient transmission of control information in a communication system using carrier aggregation. The signaling mechanism allows the transmission, on a single uplink component carrier, of control information associated with downlink transmissions on multiple aggregated downlink component carriers. Semi-statically reserved resources for the transmission of control

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information on the uplink component carrier may be dynamically shared by user terminals that are assigned multiple downlink component carriers for downlink transmissions. Implicit or explicit resource indication can be used in combination with dynamic resource indication.

[007] One exemplary embodiment of the invention comprises a method implemented by a base station of receiving control information from user terminals. The method comprises scheduling downlink transmissions to said user terminal on one or more downlink component carriers; if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier; and if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier.

[008] Another exemplary embodiment of the invention comprises a base station for transmitting data to one or more user terminals. The base station comprises a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and a controller to schedule downlink transmissions to the user terminal. The controller is configured to schedule downlink transmissions to the user terminal on one or more downlink component carriers; if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier; and, if the user terminal is scheduled to receive downlink

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transmissions on a second single downlink component carrier or multiple downlink component carriers, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier..

[009] Another exemplary embodiment of the invention comprises a method of transmitting control information implemented by a user terminal in a mobile communication network. The method comprises receiving an assignment of radio resources for downlink transmissions from a base station; transmitting control information associated with the downlink transmissions on a first set of radio resources on an uplink component carrier if an assignment of single downlink component carrier for the downlink transmission is received; and transmitting control information associated with the downlink transmissions on a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received.

[010] Another exemplary embodiment of the invention comprises a user terminal configured to send control information associated with downlink transmissions on one or more downlink component carriers. The user terminal comprises a receiver to receive downlink transmissions from a base station; a transmitter to transmit control information associated with the downlink transmission to a base station; and a controller to select radio resources for transmission of control information associated with the downlink transmissions. The controller is configured to select a first set of radio resources on an uplink component carrier if an assignment of a single downlink component carrier for the downlink transmission is received; and select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received.

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[011] Another exemplary embodiment of the invention comprises an alternate method of transmitting control information implemented by a user terminal in a mobile communication network. The method comprises receiving an assignment of radio resources for a downlink transmissions from a base station; transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink component carrier if an assignment of a first downlink component carrier for the downlink transmission is received; and transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received.

[012] Another exemplary embodiment of the invention comprises a user terminal configured to send control information associated with downlink transmissions on one or more downlink component carriers. The user terminal comprises a receiver to receive downlink transmissions from a base station; a transmitter to transmit control information associated with the downlink transmission to a base station; and a controller to select radio resources for transmission of control information associated with the downlink transmission. The controller is configured to select a first set of radio resources on an uplink component carrier if an assignment of a first downlink component carrier for the downlink transmission is received; and select a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received.

BRIEF DESCRIPTION OF THE DRAWINGS

[013] Fig. 1 illustrates an exemplary OFDM communication system.

[014] Fig. 2 illustrates an exemplary time-frequency grid for an OFDM system.

[015] Fig. 3 illustrates an exemplary time-domain structure for an OFDM system.

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[016] Fig. 4 illustrates uplink L1/L2 control signaling transmission on PUCCH.

[017] Fig. 5 illustrates the PUCCH format 1 using a normal cyclic prefix.

[018] Fig. 6 illustrates the PUCCH format 2 using a normal cyclic prefix.

[019] Fig. 7 illustrates an exemplary allocation of resource blocks for PUCCH.

[020] Fig. 8 illustrates the concept of carrier aggregation.

[021] Fig. 9 illustrates an exemplary method implemented by a base station of receiving control information from user terminals scheduled on a single carrier and multiple carriers.

[022] Fig. 10 illustrates an exemplary method implemented by a user terminal of signaling control information to a base station.

[023] Fig. 11 illustrates another exemplary method implemented by a user terminal of signaling control information to a base station.

[024] Fig. 12 illustrates an exemplary base station with a controller for controlling downlink transmissions by the base station to one or more user terminals and associated transmissions of uplink control information by the user terminals

[025] Fig. 13 illustrates an exemplary user terminal with a controller for controlling transmission of uplink control information to a base station.

DETAILED DESCRIPTION

[026] Referring now to the drawings, Fig. 1 illustrates an exemplary mobile communication network 10 for providing wireless communication services to user terminals 100. Three user terminals 100 are shown in Fig. 1. The user terminals 100 may comprise, for example, cellular telephones, personal digital assistants, smart phones, laptop computers, handheld computers, or other devices with wireless communication capabilities. The mobile communication network 10 comprises a plurality of geographic cell areas or sectors 12. Each geographic cell area or sector 12

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is served by a base station 20, which is referred to in LTE as a NodeB or Enhanced NodeB (eNodeB). A single base station 20 may provide service in multiple geographic cell areas or sectors 12. The user terminals 100 receive signals from a serving base station 20 on one or more downlink (DL) channels, and transmit signals to the base station 20 on one or more uplink (UL) channels.

[027] For illustrative purposes, an exemplary embodiment of the present invention will be described in the context of a Long-Term Evolution (LTE) system. Those skilled in the art will appreciate, however, that the present invention is more generally applicable to other wireless communication systems, including Wideband Code-Division Multiple Access (WCDMA) and WiMax (IEEE 802.16) systems.

[028] LTE uses Orthogonal Frequency Division Multiplexing (OFDM) in the downlink and Discrete Fourier Transform (DFT) spread OFDM in the uplink. The basic LTE downlink physical resource can be viewed as a time-frequency grid. Fig. 2 illustrates a portion of an exemplary OFDM time-frequency grid 50 for LTE. Generally speaking, the time-frequency grid 50 is divided into one millisecond subframes. Each subframe includes a number of OFDM symbols. For a normal cyclic prefix (CP) length, suitable for use in situations where muitipath dispersion is not expected to be extremely severe, a subframe comprises fourteen OFDM symbols. A subframe comprises twelve OFDM symbols if an extended cyclic prefix is used. In the frequency domain, the physical resources are divided into adjacent subcarriers with a spacing of 15 kHz. The number of subcarriers varies according to the allocated system bandwidth. The smallest element of the time-frequency grid 50 is a resource element. A resource element comprises one OFDM subcarrier during one OFDM symbol interval.

[029] In LTE systems, data is transmitted to the user terminals over a downlink transport channel known as the Physical Downlink Shared Channel (PDSCH). The PDSCH is a time and frequency multiplexed channel shared by a plurality of user

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terminals. As shown in Fig. 3, the downlink transmissions are organized into 10 ms radio frames. Each radio frame comprises ten equally-sized subframes. For purposes of scheduling users to receive downlink transmissions, the downlink time-frequency resources are allocated in units called resource blocks (RBs). Each resource block spans twelve subcarriers (which may be adjacent or distributed across the frequency spectrum) and one 0.5 ms slot (one half of one subframe). The term "resource block pair" refers to two consecutive resource blocks occupying an entire one millisecond subframe.

[030] The base station 20 dynamically schedules downlink transmissions to the user terminals based on channel state and quality information (CSI, CQI) reports from the user terminals on the Physical Uplink Control Channel (PUCCH) or Physical Uplink Shared Channel (PUSCH). The CQI and CSI reports indicate the instantaneous channel conditions as seen by the receiver. In each subframe, the base station 20 transmits downlink control information (DCI) identifying the user terminals that have been scheduled to receive data (hereinafter the scheduled terminals) in the current downlink subframe and the resource blocks on which the data is being transmitted to the scheduled terminals. The DCI is typically transmitted on the Physical Downlink Control Channel (PDCCH) in the first 1, 2, or 3 OFDM symbols in each subframe.

[031] Hybrid Automatic Repeat Request (HARQ) is used to mitigate errors that occur during transmission of data on the downlink. When the base station 20 indicates that a user terminal 100 is scheduled to receive a transmission on the PDSCH, the user terminal 100 decodes the PDSCH and transmits an acknowledgement (ACK/NACK message to base station 20 on the PUCCH or PUSCH. The acknowledgement message informs the base station 20 whether the data packet was correctly received by the user terminal 100. The acknowledgement message could be either a positive acknowledgement (ACK) indicating a successful decoding or a negative

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acknowledgement (NACK) message indicating a decoding failure. Based on the acknowledgement message received from the user terminal 100, base station 20 determines whether to transmit new data (ACK received) or to retransmit the previous data (NACK received).

[032] For uplink transmissions, the user terminals transmit scheduling requests (SRs) to the base station 20 on the PUCCH when the user terminals have data to send but no valid uplink grant. The base stations 20 allocate uplink resources responsive to the scheduling requests and transmit a scheduling grant to the user terminal 100 on the PDCCH. When the data is received, the base station 20 transmits ACK/NACK signaling to the user terminal 100 on the Physical Hybrid Automatic Repeat Request Indicator Channel. (PHICH) to indicate whether the data is received correctly.

[033] If the user terminal 100 has not been assigned an uplink resource for data transmission, the L1/L2 control information (CQI reports, ACK/NACKs, and SRs) is transmitted in uplink resources (resource blocks) specifically assigned for uplink transmission of L1/L2 control information on the Physical Uplink Control Channel (PUCCH). As illustrated in Fig. 4, these resources are located at the edges of the total available cell bandwidth. Each PUCCH resource comprises of one resource block (twelve subcarriers) within each of the two slots of an uplink subframe. Frequency hopping is used to provide frequency diversity. The frequency of the resource blocks alternate at the slot boundary, with one resource block at the upper part of the spectrum within the first slot of a subframe and an equally sized resource block at the lower part of the spectrum during the second slot of the subframe, or vice versa. If more resources are needed for the uplink L1/L2 control signaling, e.g., in case of very large overall transmission bandwidth supporting a large number of users, additional resources blocks can be assigned adjacent the previously assigned resource blocks.

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[034] The reasons for locating the PUCCH resources at the edges of the overall available spectrum are two-fold. First, the allocation maximizes the frequency diversity, particularly when frequency hopping is employed. Second, the allocation avoids fragmentation of the uplink spectrum, which would make it impossible to assign very wide transmission bandwidths to a single user terminal 100 and still retain the single-carrier property of the uplink transmission.

[035] The bandwidth of one resource block during one subframe is too large for the control signaling needs of a single user terminal 100. Therefore, to efficiently exploit the resources set aside for control signaling, multiple user terminals can share the same resource block. This is done by assigning the different terminals different orthogonal phase rotations of a cell-specific length-12 frequency-domain sequence. A linear phase rotation in the frequency domain is equivalent to applying a cyclic shift in the time domain. Thus, although the term "phase rotation" is used herein, the term cyclic shift is sometimes used with an implicit reference to the time domain.

[036] The resource used by a PUCCH is therefore not only specified in the time-frequency domain by the resource-block pair, but also by the phase rotation applied. Similarly to the case of reference signals, there are up to twelve different phase rotations specified in the LTE standard, providing up to twelve different orthogonal sequences from each cell-specific sequence. However, in the case of frequency-selective channels, not all the twelve phase rotations can be used if orthogonality is to be maintained. Typically, up to six rotations are considered usable in a cell.

[037] There are two message formats defined for transmission of control information on the PUCCH, each capable of carrying a different number of bits. A user terminal 100 uses PUCCH format 1 to transmit HARQ acknowledgements and scheduling requests. For CQI reporting, the user terminal 100 uses PUCCH format 2.

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[038] Hybrid-ARQ acknowledgements are used to acknowledge the reception of one (or two in case of spatial multiplexing) transport blocks in the downlink. Scheduling requests are used to request resources for uplink data transmission. A scheduling request is transmitted only when the user terminal 100 is requesting resources, otherwise the user terminal 100 stays silent in order to save battery resources and not create unnecessary interference. For scheduling requests, no explicit information bit is transmitted. Instead, the user terminal requests uplink resources by the presence (or absence) of energy on the corresponding PUCCH. Although HARQ acknowledgements and scheduling requests serve different purposes, they share the same PUCCH format. This format is referred to as PUCCH format 1 in the specifications

[039] Fig. 5 illustrates the structure of a PUCCH format 1 message. The PUCCH format 1 uses the same structure in each of the two slots of a subframe. For transmission of a HARQ acknowledgement, the single HARQ acknowledgement bit is used to generate a BPSK symbol (in case of downlink spatial multiplexing the two acknowledgement bits are used to generate a QPSK symbol). For a scheduling request, on the other hand, the BPSK/QPSK symbol is replaced by a constellation point treated as negative acknowledgement at the base station 20. The modulation symbol is then used to generate the signal to be transmitted in each of the two PUCCH slots.

[040] A PUCCH format 1 resource, used for either a HARQ acknowledgement or a scheduling request, is represented by a single scalar resource index. From the index, the phase rotation and the orthogonal cover sequence is derived. For HARQ transmission, the resource index to use for transmission of the HARQ acknowledgement is given implicitly by the DCI transmitted on the PDCCH to schedule the downlink transmission to the user terminal 100. Thus, the resources to use for an uplink HARQ acknowledgement vary dynamically and depend on the DCI used to schedule the user terminal 100 in each subframe.

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[041] In addition to dynamic scheduling based on the DCI transmitted by the base station on the PDCCH, it is also possible to semi-persistently schedule a user terminal 100 according to a specific pattern. In this case the configuration information indicating the semi-persistent scheduling pattern includes information on the PUCCH index to use for the HARQ acknowledgements. The configuration information also informs the user terminal 100 which PUCCH resources to use for transmission of scheduling requests.

[042] The PUCCH resources are split into two parts: a semi-static part and a dynamic part. The semi-static part of the PUCCH resources is used for scheduling requests and HARQ acknowledgements from semi-persistent users. The amount of resources used for the semi-static part of PUCCH 1 resources does not vary dynamically. The dynamic part is used for dynamically scheduled user terminals. As the number of dynamically scheduled terminals varies, the amount of resources used for the dynamic PUCCHs varies.

[043] Channel-status reports are used to provide the base station 20 with an estimate of the channel conditions as seen by the user terminal 100 in order to aid channel-dependent scheduling. A channel-status report consists of multiple bits per subframe. PUCCH format 1, which is capable of at most two bits of information per subframe, can not be used for this purpose. Transmission of channel-status reports on the PUCCH is instead handled by PUCCH format 2, which is capable of multiple information bits per subframe.

[044] PUCCH format 2, illustrated for normal cyclic prefix in Fig. 6, is based on a phase rotation of the same cell-specific sequence as format 1. Similarly to format 1, a format 2 resource can be represented by an index from which the phase rotation and other quantities necessary are derived. The PUCCH format 2 resources are semi-statically configured.

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[045] Both PUCCH format 1 and format 2 signaling messages are transmitted on a resource-block pair with one resource block in each slot. The resource-block pair is determined from the PUCCH resource index. Thus, the resource-block number to use in the first and second slot of a subframe can be expressed as

$$\text{RBnumber}(i) = f(\text{PUCCH index}, i)$$

where i is the slot number (0 or 1) within the subframe and f a function found in the specification.

[046] Multiple resource-block pairs can be used to increase the control-signaling capacity. When one resource-block pair is full, the next PUCCH resource index is mapped to the next resource-block pair in sequence. The mapping is done such that PUCCH format 2 (channel-status reports) is transmitted closest to the edges of the uplink cell bandwidth with the semi-static part of PUCCH format 1 next and finally the dynamic part of PUCCH format 1 in the innermost part of the bandwidth as shown in Fig. 7.

[047] Three semi-statically parameters are used to determine the resources to use for the different PUCCH formats:

- $N_{\text{RB}}^{(2)}$, provided as part of the system information, controls on which resource-block pair the mapping of PUCCH format 1 starts
- $N_{\text{PUCCH}}^{(1)}$ controls the split between the semi-static and dynamic part of PUCCH format 1
- $N_{CS}^{(1)}$ controls the mix of format 1 and format 2 in one resource block. In most cases, the configuration is done such that the two PUCCH formats are mapped to separate sets of resource blocks, but there is also a possibility to have the border between format 1 and 2 within a resource block.

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[048] In order to support bandwidths greater than 20MHz, carrier aggregation will be supported in LTE Rel 10. To maintain backward compatibility with Rel 8 user terminals 100, the available spectrum is divided into Rel-8 compatible component carriers (e.g., 20 Mhz component carriers) as shown in Fig. 8. A user terminal 100 can obtain bandwidth up to 100 MHz by transmitting on multiple component carriers. The use of multiple component carriers for data transmission is known as carrier aggregation.

[049] The number of aggregated component carriers as well as the bandwidth of the individual component carrier may be different for Uplink (UL) and Downlink (DL). A symmetric configuration refers to the case where the number of component carriers in DL and UL are the same. An asymmetric configuration refers to the case where the number of component carriers is different for the UL and DL. The number of component carriers configured for a geographic cell area 12 may be different from the number of component carriers seen by the user terminal 100. A user terminal 100 may, for example, support more DL component carriers than UL component carriers, even though in the geographic cell area 12 the same number of UL and DL component carriers is offered by the network.

[050] One consideration for carrier aggregation is how to configure the PUCCH for uplink control signaling from the user terminal. One solution is to transmit the uplink control information on multiple control channels on multiple UL component carriers. However, this option is likely to result in higher user terminal power consumption and a dependency on specific user terminal capabilities. It may also create implementation issues due to inter-modulation products, and may lead to generally higher complexity for implementation and testing.

[051] According to some embodiments of the present invention, the PUCCH resources on a single uplink component carrier are used to support downlink transmissions on several downlink component carriers. With this approach, a user terminal 100 transmit

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HARQ signaling associated with downlink transmissions on two or more downlink component carriers on PUCCH resources on a single uplink component carrier. Similarly, a single uplink component carrier may be used to support uplink transmissions on several uplink component carriers. For example, a user terminal 100 may use PUCCH resources on a single uplink component carrier to request uplink resources on multiple uplink component carriers. The uplink component carrier on which PUCCH resources are used to support downlink or uplink transmissions on two or more component carriers is referred to herein as uplink primary component carrier (UL PCC) or uplink associated with the primary cell (PCell).

[052] For HARQ signaling, a straight-forward approach would be to increase the PUCCH resources on the UL PCC for PUCCH format 1 by a factor of N, where N is the number of aggregated downlink component carriers supported. However, consideration should be given to the typical expected use case. Not all user terminals 100 will be scheduled to receive downlink transmission on multiple downlink component carriers. The number of downlink component carriers used for transmission will be user terminal specific and will vary dynamically as user terminals 100 are scheduled. With bursty data-transmission, the number of user terminals 100 simultaneously assigned resources on several downlink carriers is expected to be rather small. Multiple downlink component carriers are only needed when there are not enough resources on a single component carrier, and there appears to be no benefits from assigning several smaller transport blocks on multiple downlink component carriers for a large number of user terminals 100. Therefore, the design of the ACK/NACK feedback on PUCCH should be optimized for a low number of simultaneous user terminals 100 with assignments on multiple downlink component carrier.

[053] Considering that the typical use case is a rather small number of user terminals 100 simultaneously assigned resources on multiple downlink component carriers,

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increasing the overhead with a factor of N is probably not necessary. Rather, the amount of resources should be chosen in anticipation on the number of user terminals 100 that simultaneously are expected to have assignments on multiple downlink component carriers, which is expected to be scenario and implementation dependent. This could be achieved by configuring a set of uplink resources upon which the currently scheduled user terminal(s) 100 using multiple component carriers transmit the ACK/NACK feedback.

[054] According to a first approach, a set of shared PUCCH resources of potentially configurable size, in addition to PUCCH resources according to LTE Rel-8, is allocated for HARQ acknowledgements by user terminals 100 which receive downlink assignments on multiple downlink component carriers. The resource set and/or the size of the resource set can be transmitted to the user terminal by Radio Resource Control (RRC) signaling. With this approach, the UL PCC contains PUCCH resources according to LTE Rel-8 for HARQ acknowledgements from user terminals 100 assigned resources for downlink transmission on a single downlink component carrier associated with the UL PCC. The shared PUCCH resource would be used by user terminals 100 which receive resource assignments for downlink transmission on multiple downlink component carriers. There may be some circumstances, such as retransmissions, when the user terminal 100 is assigned resources on a single downlink component carrier that is different from the downlink component carrier associated with the UL PCC. In such a case the shared set of PUCCH resources can also be used for such "cross-carrier" HARQ acknowledgements.

[055] According to a second approach, a set of shared PUCCH resources of potentially configurable size, in addition to PUCCH resources according to LTE Rel-8, is allocated for HARQ acknowledgements by user terminals 100 which receive downlink assignments on at least one downlink component carrier other than the downlink

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component carrier having associated Rel- 8 resources on the UL PCC. The resource set and/or the size of the resource set can be transmitted to the user terminal by RRC signaling.

[056] With either of the above approaches, the set of shared PUCCH resources may be made visible to the user terminal 100 in the same way as for LTE Rel-8 user terminals 100, namely in the form of an association rule between the DL PDCCH CCE and index to PUCCH resource. Thus, from a system perspective, the two sets of PUCCH resources could overlap or be interleaved. In principle, a user terminal 100 could be configured with semi-static PUCCH resources for HARQ acknowledgements and then use these resources for HARQ acknowledgements in case of multiple DL component carrier assignments. By configuring all the user terminals 100 in the cell to have the same semi-static ACK/NACK resources, such a scheme would allow for assigning at most a single user terminal multiple DL component carrier at the same time. When there is no need for HARQ acknowledgements of multiple carriers, the resource could of course be used for data transmission. The user terminals 100 could select which shared PUCCH resources to use based on component carrier, DL PDDCH CCE, C-RNTI and other parameters. There is though a risk for collisions or scheduling constraints, and to reduce this, one could consider having a dynamic indicator to aid the selection of PUCCH resource. The dynamic indication allows managing the ACK/NACK resources more carefully which is of interest when the amount of resources reserved for HARQ acknowledgements is small and orthogonality is desired.

[057] In one exemplary embodiment, semi-static PUCCH resources are reserved for user terminals 100 configured with multiple downlink component carriers. The assignment of PUCCH resources can be achieved by implicit indication of actual resource block, e.g., utilizing CCE index, number of the downlink component carriers, RNTI or a combination of these parameters. Alternatively, reserved PUCCH resources

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can be indicated explicitly via signaling to the user terminal 100 (e.g., RRC signaling), or by a combination of implicit and explicit signaling. Additionally, dynamic indication of PUCCH resources for HARQ acknowledgements can be done by using additional relative or explicit dynamic indication to select actual PUCCH resources out of the set of implicit/explicitly reserved (e.g., semi-statically reserved) resources. For example, the base station 20 may send as a control message or part of a control message, an indicator, referred to herein as an acknowledgement resource indication (ARI), comprising a single bit to indicate that the user terminal 100 should use the next available PUCCH resource or the next cyclically available PUCCH resource from the set of semi-statically reserved PUCCH resources. In some embodiments, the ARI may comprise the entire control message. In other embodiment, the ARI may be included as an information element in a larger control message. Alternatively, the base station 20 can send a multi-bit ARI to indicate the actual PUCCH resource out of the set of semi-statically reserved PUCCH resources.

[058] There may be at least two different mappings to PUCCH resources on the UL PCC. A first resource mapping may be used for HARQ acknowledgements of downlink transmissions on a single designated downlink component carrier, and a second mapping for HARQ acknowledgements of downlink transmissions on at least one other downlink component carrier. The two mappings may be described by parameters, such as first resource and size of resource set that are configurable by means of higher layer signaling. The user terminal 100 may, based on the detected downlink assignments on one or several downlink component carriers, select one of the two mappings. In a preferred embodiment, the first mapping coincides with the Rel-8 mapping rules for ACK/NACK resources.

[059] The user terminal 100 may, depending on the detected downlink assignments, and the downlink component carriers on which the downlink assignment was sent, select

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which mapping to use. Two approaches may be used by the user terminal 100 to select the mapping of radio resources for uplink control signaling. In the first approach, the user terminal 100 selects a first mapping if downlink assignment of a single downlink component carrier is detected and the downlink assignment is sent on the associated downlink component carrier. The user terminal 100 selects a second mapping if it detects at least one downlink assignment for at least one downlink component carrier different from the single associated downlink component carrier (for which there are Rel-8 ACK/NACK resources). In a second approach, the user terminal selects a mapping depending on the number of component carriers it detects for downlink assignments for downlink transmissions.

[060] Fig. 9 illustrates an exemplary method 50 implemented by a base station 20 in a communication network 10 of receiving uplink control information from a user terminal 100 depending ion the assignment of downlink component carriers. The base station 20 schedules the user terminal 100 to receive downlink transmissions on one or more downlink component carriers (block 52). The user terminal 100 may be scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary uplink component carrier. In this case, the base station 20 receives control information associated with the downlink transmissions to the user terminal 100 on a first set of radio resources on the uplink primary component carrier (block 54). Alternatively, the user terminal 100 may be scheduled to receive downlink transmissions on multiple downlink component carriers, or on a single downlink component carrier other than the downlink component carrier associated with the uplink primary component carrier. In this alternative case, the base station 20 receives uplink control information associated with the downlink transmissions from the user terminal 100 on a second set of radio resources on the uplink component carrier (block 56).

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[061] Fig. 10 illustrates an exemplary method 60 implemented by a user terminal of transmission of uplink control signaling to a base station 20. The user terminal 100 receives a radio resource assignment for a downlink transmission from the base station 20 (block 62). If the user terminal 100 detects assignments of radio resources for a single downlink component carrier, the user terminal 100 transmits, on a first set of radio resources on an uplink primary component carrier, uplink control information associated with the downlink transmissions (block 64). On the other hands, if the user terminal 100 receives assignments for multiple downlink component carriers, the user terminal 100 transmits, on a second set of radio resources on the uplink primary component carrier, uplink control information associated with downlink transmissions (block 66).

[062] Fig. 11 illustrates another exemplary method 70 implemented by a user terminal 100 of transmission of uplink control signaling to a base station 20. The user terminal 100 receives a radio resource assignment for a downlink transmission from the base station 20 (block 72). If the user terminal 100 detects assignments of radio resources for a first downlink component carrier, the user terminal 100 transmits, on a first set of radio resources on a uplink primary component carrier, uplink control information associated with the downlink transmissions (block 74). On the other hands, if the user terminal 100 receives assignments for a second downlink component carrier, the user terminal 100 transmits, on a second set of radio resources on the primary uplink component carrier, uplink control information associated with downlink transmissions (block 76).

[063] Fig. 12 illustrates an exemplary base station 20 according to the present invention. The base station 20 comprises a transceiver 22 for communicating with user terminals and processing circuit 32 for processing the signals transmit and received by the transceiver 22. The transceiver 22 includes a transmitter 24 coupled to one or more transmit antennas 28 and receiver 26 coupled to one or more receive antennas 30. The same antenna(s) 28, 30 may be used for both transmission and reception. The

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processing circuit 32 may be implemented by one or more processors, hardware, firmware or a combination thereof. Typical functions of the processing circuit 32 include modulation and coding of transmitted signals, and the demodulation and decoding of received signals. The processing circuit 32 also includes a controller 34 for controlling the operation of the base station 20. The controller 34 is responsible for transmission of downlink control information on the PDCCH, and for the processing of uplink control information received on the PUCCH.

[064] Fig. 13 illustrates a functional block diagram of an exemplary user terminal 100. The user terminal 100 comprises a transceiver 110 and a processing circuit 120. The transceiver 110 comprises a transmitter 112 coupled to one or more transmit antennas 114, and a receiver 116, coupled to one or more receive antennas 118. Those skilled in the art will appreciate that the same antennas may be used for transmission and reception. The processing circuit 120 processes signals transmitted and received by the transceiver 110. The processing circuit 120 comprises one or more processors, hardware, firmware, or a combination thereof. Typical functions of the processing circuit 120 include modulation end coding of transmitted signals, and the demodulation and decoding of received signals. The processing circuit 120 includes a controller 122 for controlling uplink transmissions and the reception of downlink transmissions. The controller 122 generates uplink control information for transmission on the PUCCH, and processes downlink control information received on the PDCCH as previously described.

[065] The invention provides means for efficient transmission of PUCCH on one component carrier corresponding to multiple downlink component carriers, without creating implementation problems in the user terminal or being over-dimensioned and therefore inefficient.

[066] The present invention may, of course, be carried out in other specific ways than those herein set forth without departing from the scope and essential characteristics of

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the invention. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

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CLAIMS

What is claimed is:

1. A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to said user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier; and

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier.

2. The method of claim 1 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier.

3. The method of claim 2 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier.

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4. The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

5. The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index.

6. The method of claim 5 wherein the explicit indication is transmitted as radio resource control signaling.

7. The method of claim 1 further comprising transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

8. The method of claim 7 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

9. A base station comprising:

a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and

a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to

schedule downlink transmissions to a user terminal on one or more downlink component carriers;

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if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier; and

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier.

10. The base station of claim 9 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier.

11. The base station of claim 10 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set of radio resources on the uplink primary component carrier.

12. The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources implicitly by sending at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

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13. The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources explicitly by sending an uplink control channel index.

14. The base station of claim 13 wherein the controller is further configured to send the explicit indication as radio resource control signaling.

15. The base station of claim 9 wherein the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

16. The base station of claim 15 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

17. A method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising:

receiving an assignment of radio resources for downlink transmissions from a base station;

transmitting control information associated with the downlink transmissions on a first set of radio resources on an uplink component carrier if an assignment of single downlink component carrier for the downlink transmission is received; and

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transmitting control information associated with the downlink transmissions on a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component for the downlink transmission is received.

18. The method of claim 17 further comprising transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission.

19. The method of claim 17 further comprising receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink primary component carrier.

20. The method of claim 19 wherein receiving control information comprises receiving one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources.

21. The method of claim 19 wherein receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources.

22. The method of claim 21 wherein the explicit indication is received as radio resource control signaling.

23. The method of claim 17 further comprising receiving, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically

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assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

24. The method of claim 23 further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

25. A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with the downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink component carrier if an assignment of a single downlink component carrier for the downlink transmission is received; and

select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received.

26. The user terminal of claim 25 configured to transmit user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission.

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27. The user terminal of claim 25 wherein the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier.

28. The user terminal of claim 27 wherein the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources.

29. The user terminal of claim 27 wherein the controller is further configured to receive an uplink control channel index explicitly identifying the second set of radio resources on the uplink primary component carrier.

30. The user terminal of claim 29 wherein the controller is further configured to receive the explicit indication as radio resource control signaling.

31. The user terminal of claim 25 wherein the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

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32. The user terminal of claim 31 wherein the controller is configured to select the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

33. A method implemented by a user terminal in a mobile communication network, the method comprising:

receiving an assignment of radio resources for a downlink transmissions from a base station;

transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink component carrier if an assignment of a first downlink component carrier for the downlink transmission is received; and

transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received.

34. A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with downlink transmission, the controller configured to:

select a first set of radio resources on an uplink component carrier if an assignment of a first downlink component carrier for the downlink transmission is received; and

select a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received.

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ABSTRACT

The invention is a method and apparatus for signaling uplink control information in a mobile communication network using carrier aggregation. The signaling mechanism allows the transmission, on a single uplink component carrier, of control information associated with a downlink transmission on multiple aggregated downlink component carriers. Semi-statically reserved resources for the transmission of control information on the uplink component carrier may be dynamically shared by user terminals that are assigned multiple downlink component carriers for downlink transmissions. Implicit or explicit resource indication can be used in combination with dynamic resource indication.

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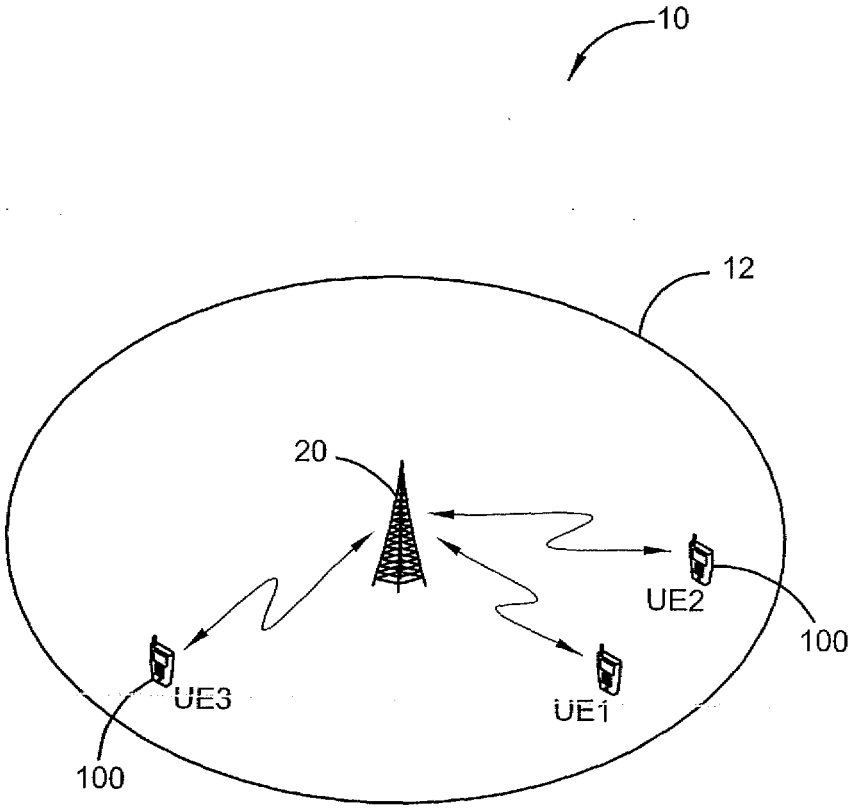

FIG. 1

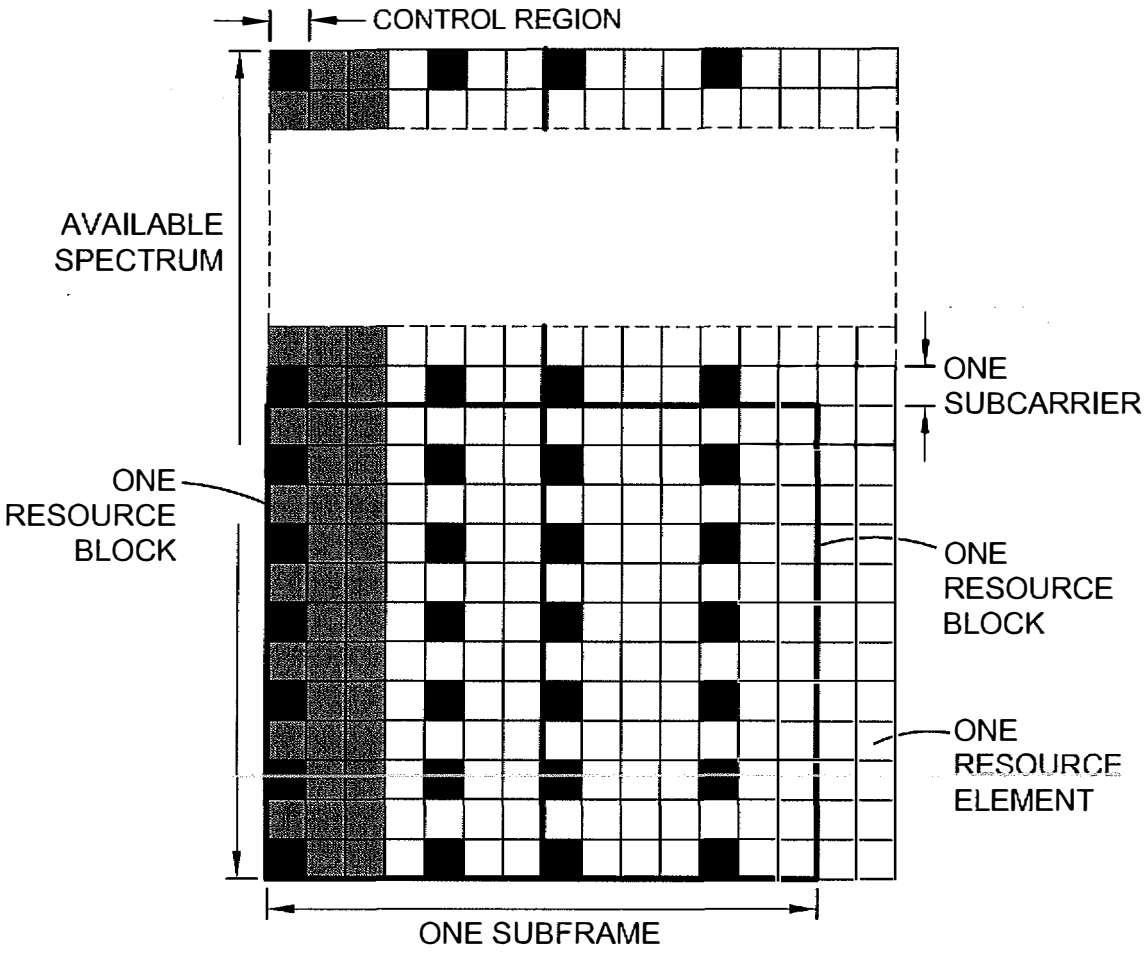
CONTROL REGION
AVAILABLE SPECTRUM
ONE SUBCARRIER
ONE RESOURCE BLOCK
ONE RESOURCE BLOCK
ONE RESOURCE ELEMENT
ONE SUBFRAME

FIG. 2

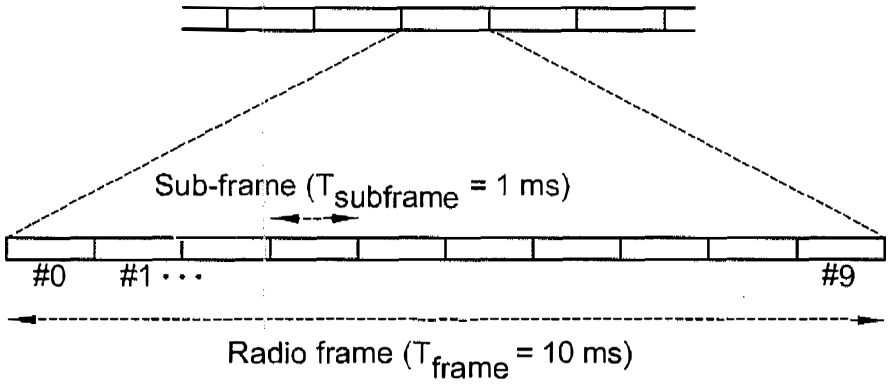

FIG. 3

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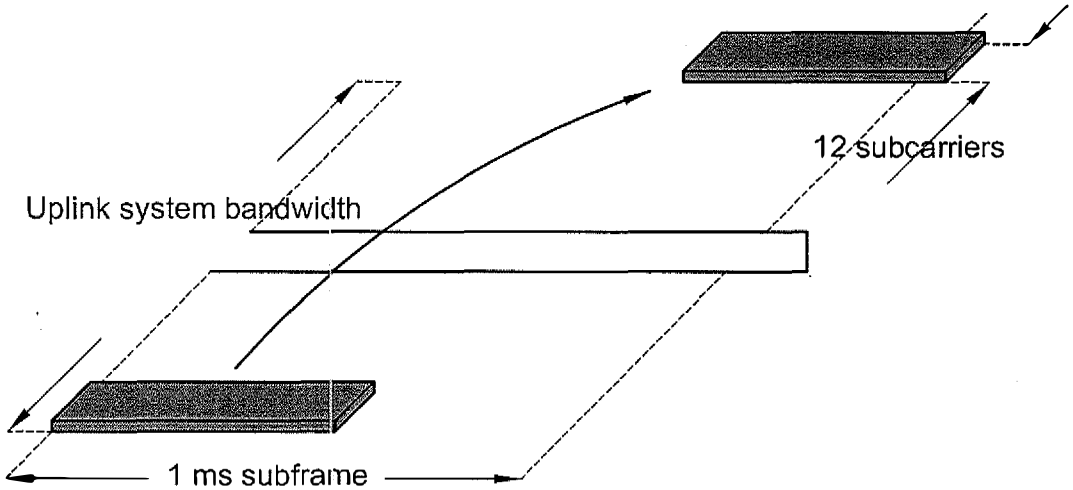

FIG. 4

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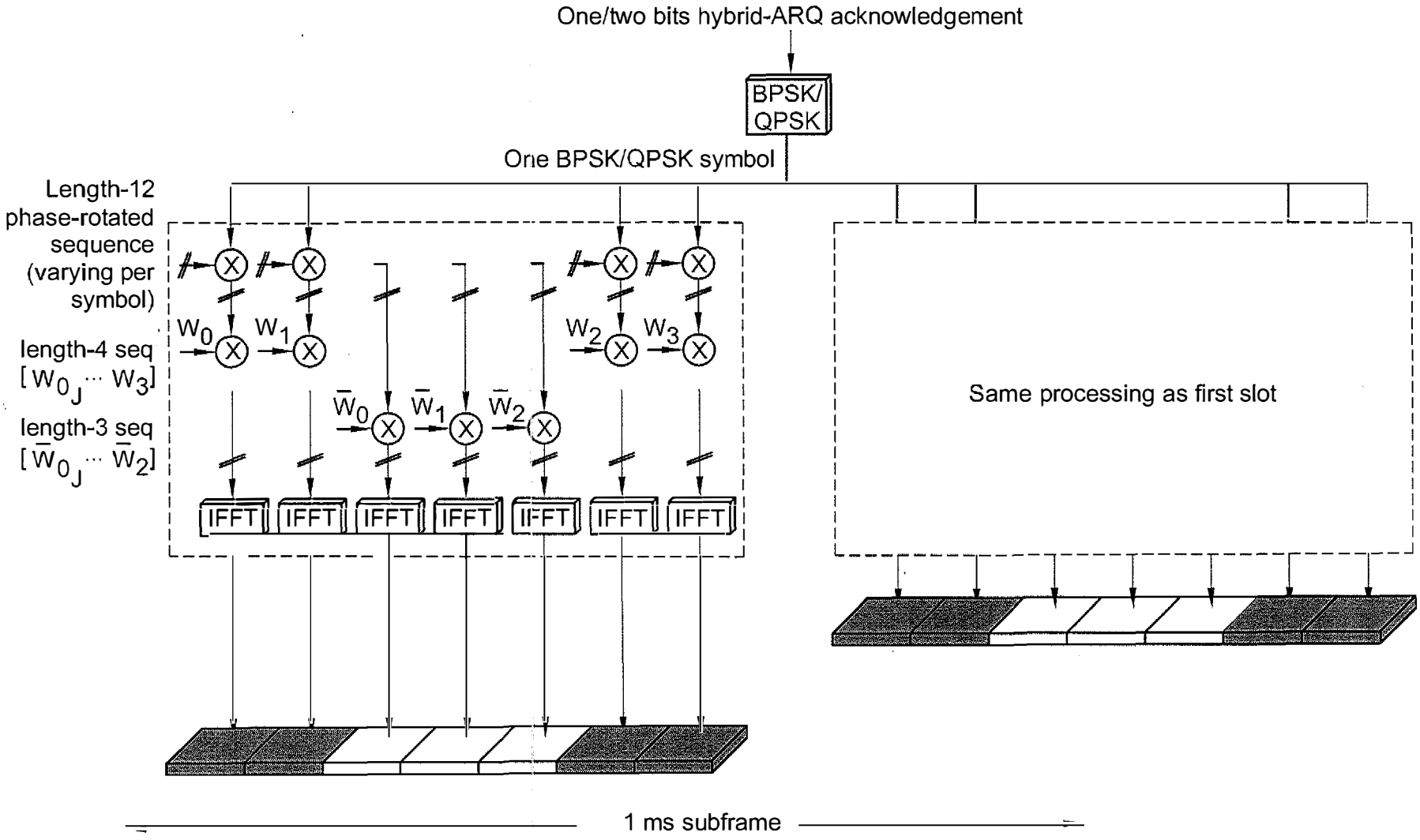
One/two bits hybrid-ARQ acknowledgement
BPSK/
QPSK
One BPSK/QPSK symbol
Length-12
phase-rotated
sequence
(varying per
symbol)
length-4 seq
[W0 ... W3]
length-3 seq
[W̄0 ... W̄2]
W0
W1
W2
W3
W̄0
W̄1
W̄2
IFFT
Same processing as first slot
1 ms subframe

FIG. 5

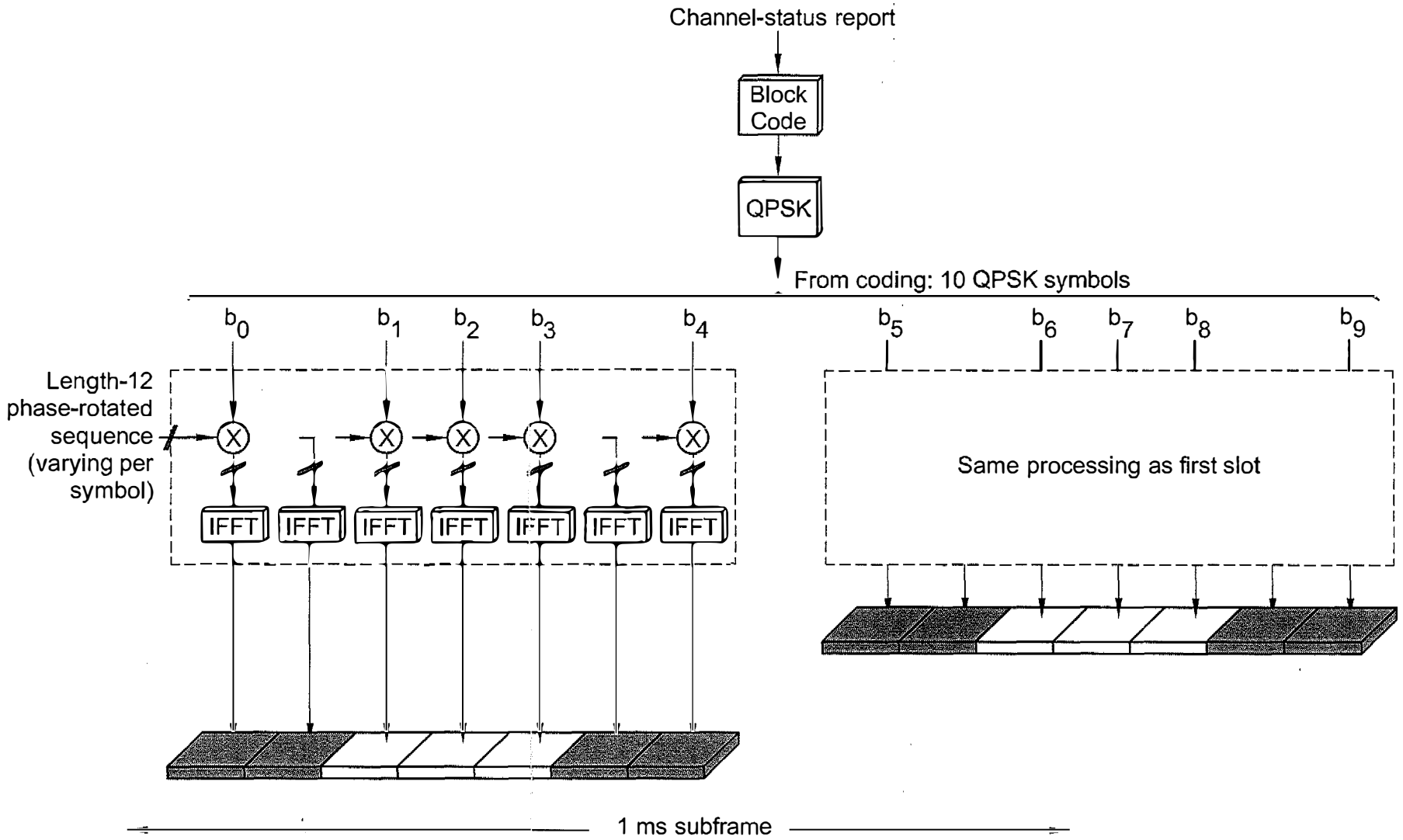
Channel-status report
Block Code
QPSK
From coding: 10 QPSK symbols
b0
b1
b2
b3
b4
b5
b6
b7
b8
b9
Length-12 phase-rotated sequence (varying per symbol)
IFFT
Same processing as first slot
1 ms subframe

FIG. 6

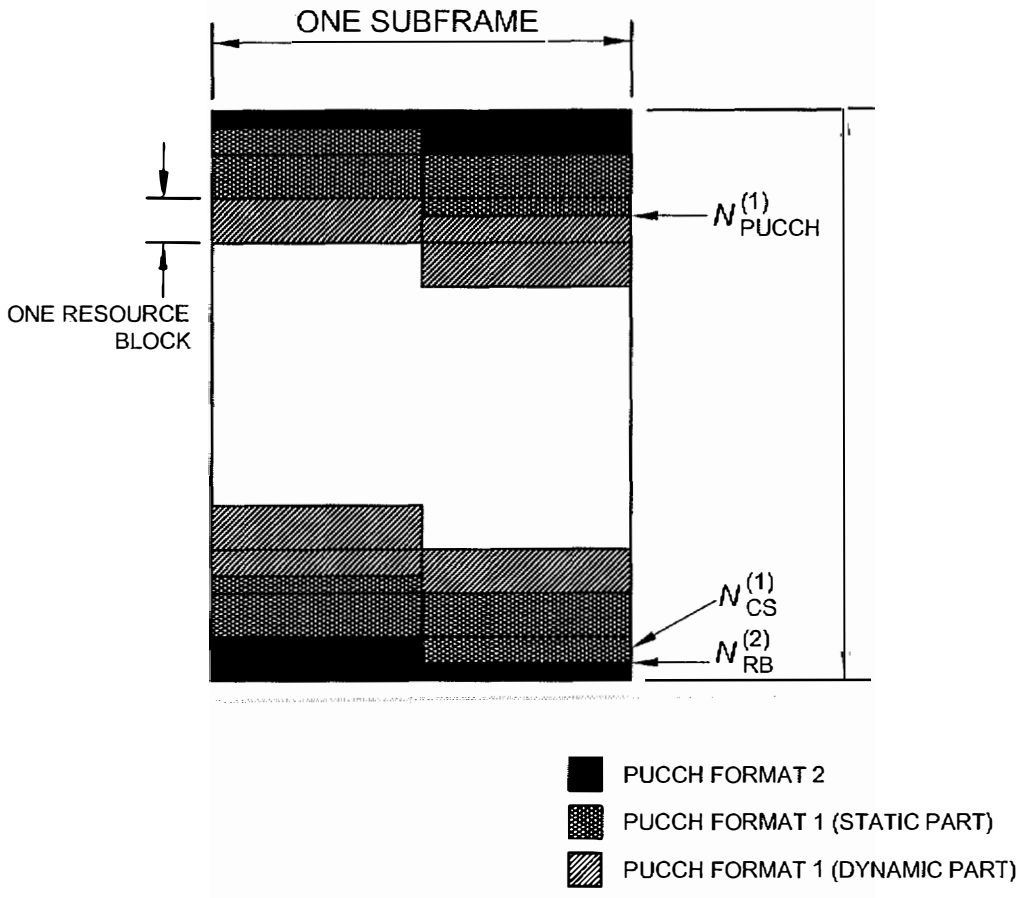
ONE SUBFRAME
ONE RESOURCE BLOCK
$N^{(1)}_{PUCCH}$
$N^{(1)}_{CS}$
$N^{(2)}_{RB}$
PUCCH FORMAT 2
PUCCH FORMAT 1 (STATIC PART)
PUCCH FORMAT 1 (DYNAMIC PART)

FIG. 7

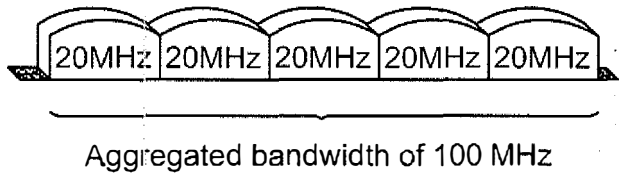
20MHz
20MHz
20MHz
20MHz
20MHz
Aggregated bandwidth of 100 MHz

FIG. 8

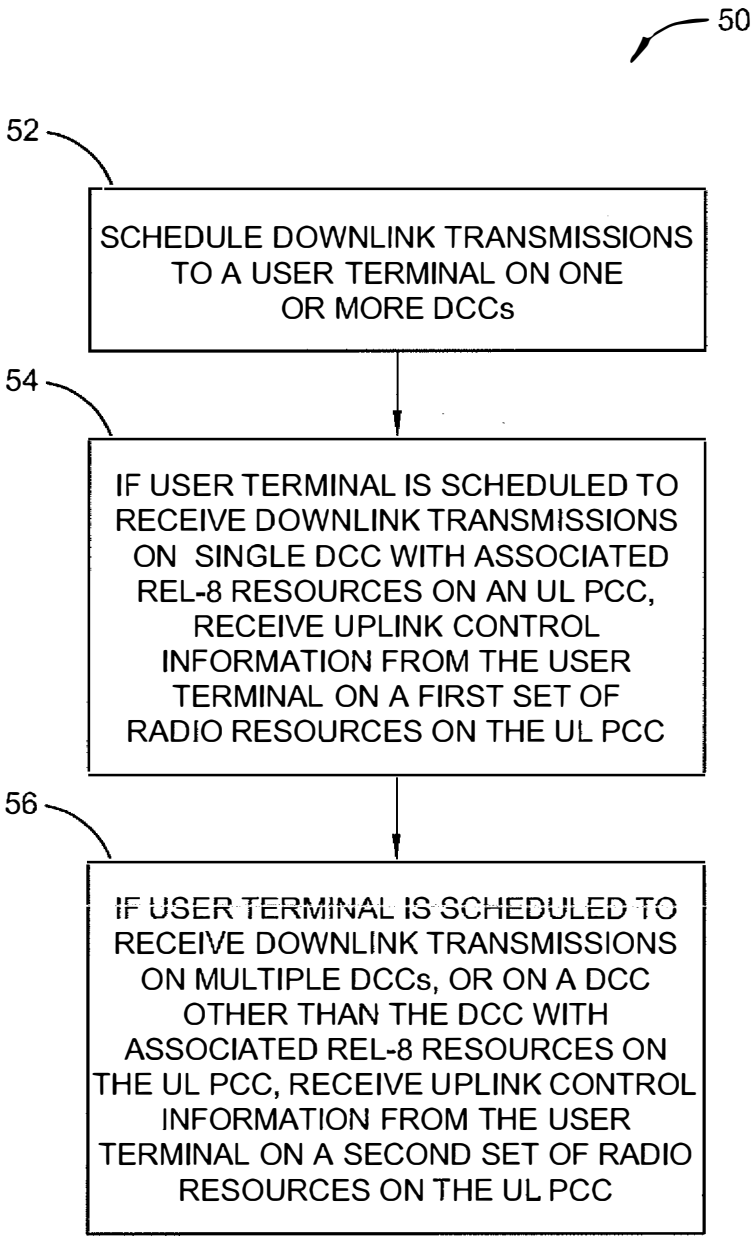
50
52
SCHEDULE DOWNLINK TRANSMISSIONS TO A USER TERMINAL ON ONE OR MORE DCCs
54
IF USER TERMINAL IS SCHEDULED TO RECEIVE DOWNLINK TRANSMISSIONS ON SINGLE DCC WITH ASSOCIATED REL-8 RESOURCES ON AN UL PCC, RECEIVE UPLINK CONTROL INFORMATION FROM THE USER TERMINAL ON A FIRST SET OF RADIO RESOURCES ON THE UL PCC
56
IF USER TERMINAL IS SCHEDULED TO RECEIVE DOWNLINK TRANSMISSIONS ON MULTIPLE DCCs, OR ON A DCC OTHER THAN THE DCC WITH ASSOCIATED REL-8 RESOURCES ON THE UL PCC, RECEIVE UPLINK CONTROL INFORMATION FROM THE USER TERMINAL ON A SECOND SET OF RADIO RESOURCES ON THE UL PCC

FIG. 9

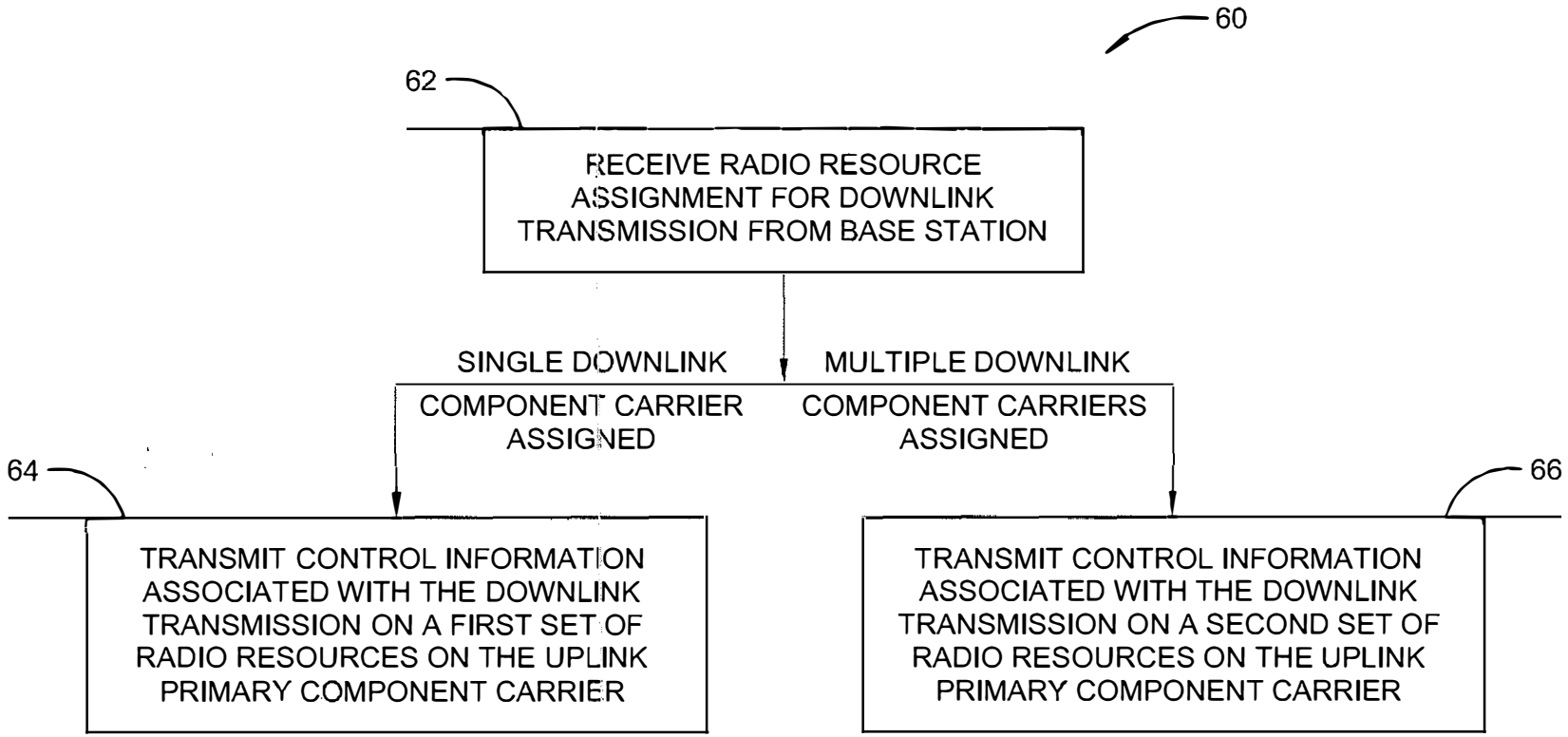
60
62
RECEIVE RADIO RESOURCE ASSIGNMENT FOR DOWNLINK TRANSMISSION FROM BASE STATION
SINGLE DOWNLINK COMPONENT CARRIER ASSIGNED
MULTIPLE DOWNLINK COMPONENT CARRIERS ASSIGNED
64
66
TRANSMIT CONTROL INFORMATION ASSOCIATED WITH THE DOWNLINK TRANSMISSION ON A FIRST SET OF RADIO RESOURCES ON THE UPLINK PRIMARY COMPONENT CARRIER
TRANSMIT CONTROL INFORMATION ASSOCIATED WITH THE DOWNLINK TRANSMISSION ON A SECOND SET OF RADIO RESOURCES ON THE UPLINK PRIMARY COMPONENT CARRIER

FIG. 10

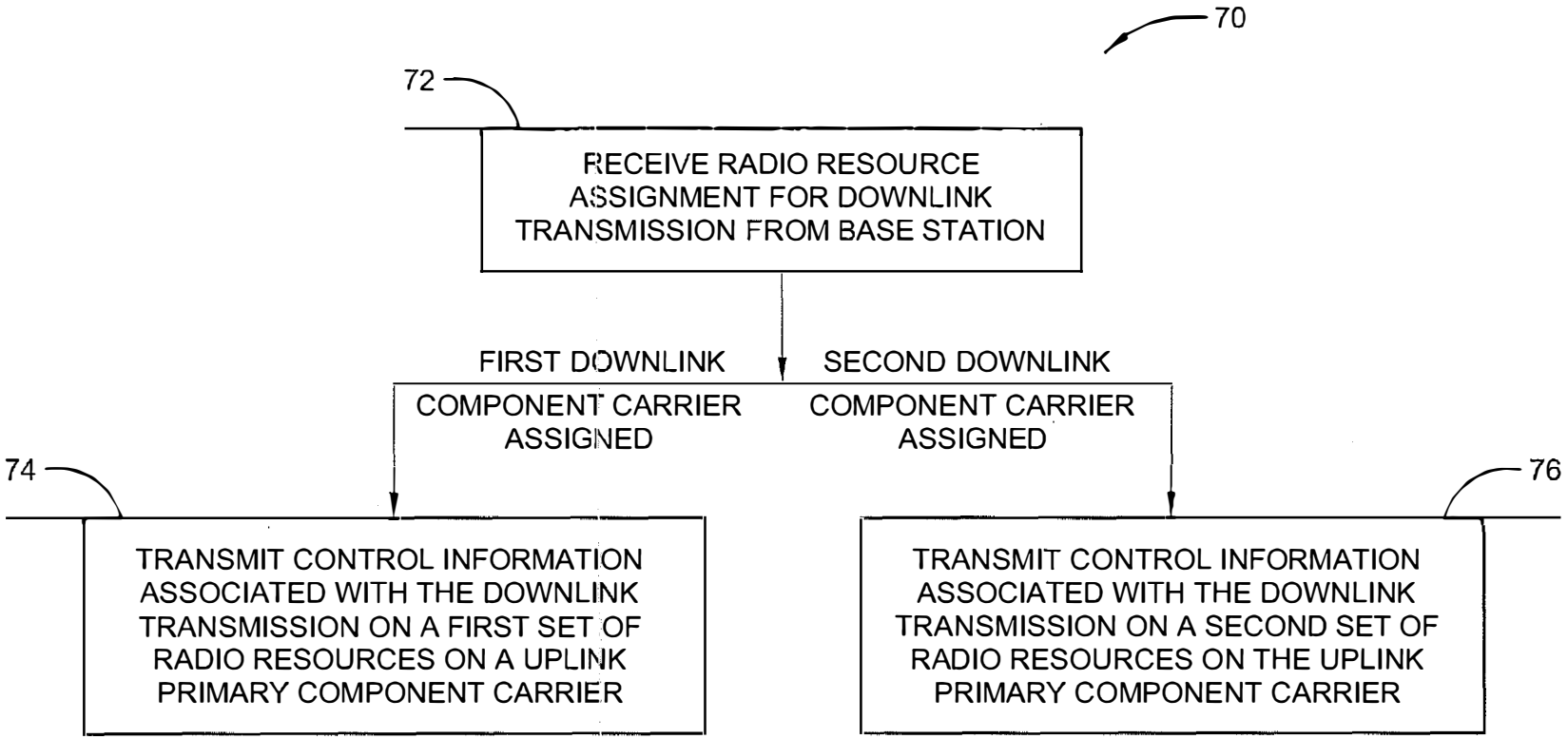
70
72
RECEIVE RADIO RESOURCE ASSIGNMENT FOR DOWNLINK TRANSMISSION FROM BASE STATION
FIRST DOWNLINK COMPONENT CARRIER ASSIGNED
SECOND DOWNLINK COMPONENT CARRIER ASSIGNED
74
TRANSMIT CONTROL INFORMATION ASSOCIATED WITH THE DOWNLINK TRANSMISSION ON A FIRST SET OF RADIO RESOURCES ON A UPLINK PRIMARY COMPONENT CARRIER
76
TRANSMIT CONTROL INFORMATION ASSOCIATED WITH THE DOWNLINK TRANSMISSION ON A SECOND SET OF RADIO RESOURCES ON THE UPLINK PRIMARY COMPONENT CARRIER

FIG. 11

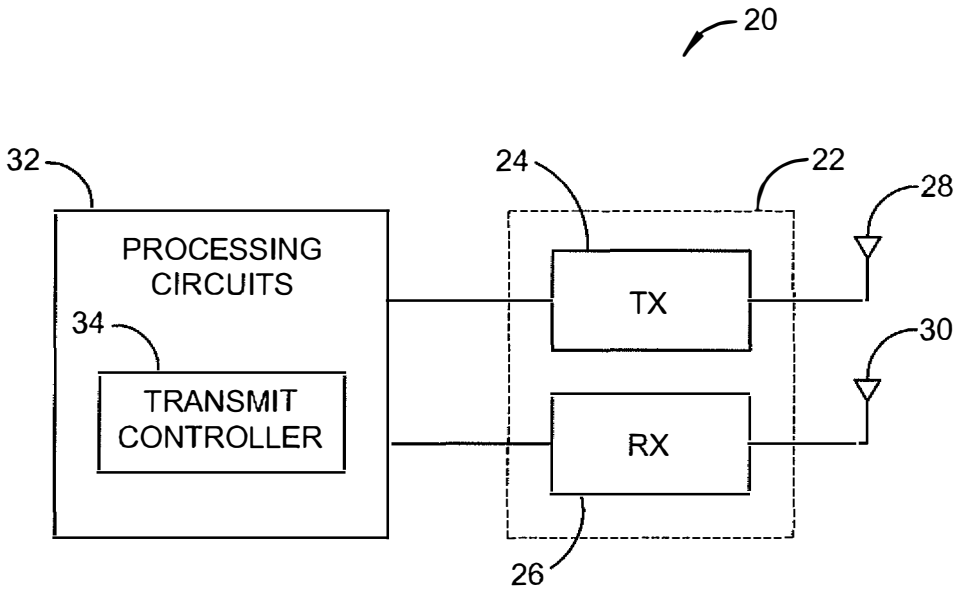
20
32
PROCESSING CIRCUITS
34
TRANSMIT CONTROLLER
24
22
28
TX
30
RX
26

FIG. 12

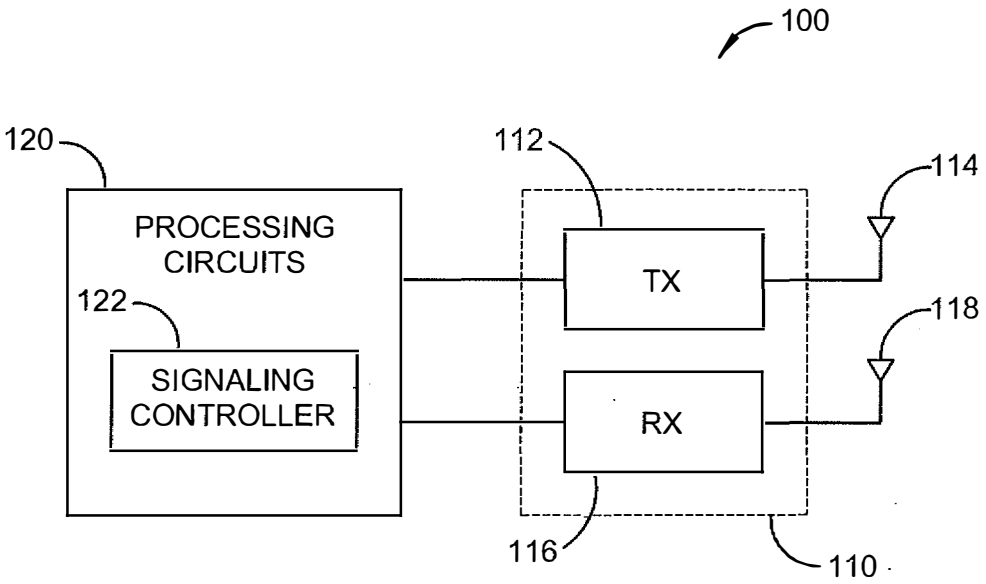
100
120
PROCESSING CIRCUITS
122
SIGNALING CONTROLLER
112
114
TX
118
RX
116
110

FIG. 13

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Filer:	David E. Bennett/Kathleen Koppen
Attorney Docket Number:	4015-6942 / P30138-US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Claims in excess of 20	1202	14	52	728
Independent claims in excess of 3	1201	3	220	660
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2478**

Electronic Acknowledgement Receipt

EFS ID:	8551147
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	David E. Bennett/Kathleen Koppen
Filer Authorized By:	David E. Bennett
Attorney Docket Number:	4015-6942 / P30138-US2
Receipt Date:	04-OCT-2010
Filing Date:	
Time Stamp:	11:47:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$2478
RAM confirmation Number	7381
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if ap...

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1		4015-6942.pdf	2015722 616098cf9d8e508c4423f18e41938765d4cd3251	yes	49

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Application Data Sheet	1	5
Specification	6	27
Claims	28	36
Abstract	37	37
Drawings-only black and white line drawings	38	49

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	37856 c6a91787cf232f5ed3c775ea2920d5eb76e4b8ab	no	2

Warnings:

Information:

Total Files Size (in bytes):	2053578

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Date: 10/04/2010

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number: **12/896,993**

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	330
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	34 minus 20 =	* 14	X 26=		OR	X 52=	728
INDEPENDENT CLAIMS (37 CFR 1.16(h))	6 minus 3 =	* 3	X 110=			X 220=	660
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2478

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N.A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	X =		OR	X =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X =		OR	X =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/896,993	10/04/2010		2478	4015-6942 / P30138-US2	34	6

CONFIRMATION NO. 1015

24112
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

FILING RECEIPT

OC000000044046246

Date Mailed: 10/20/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

David Astely, Bromma, SWEDEN;
Robert Baldemair, Solna, SWEDEN;
Dirk Gerstenberger, Stockholm, SWEDEN;
Daniel Larsson, Solna, SWEDEN;
Lars Lindbom, Karlstad, SWEDEN;
Stefan Parkvall, Stockholm, SWEDEN;

Assignment For Published Patent Application

Telefonaktiebolaget L M Ericsson (publ), Stockholm, SWEDEN

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/248,661 10/05/2009

Foreign Applications

If Required, Foreign Filing License Granted: 10/18/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/896,993**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

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Title

PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced

Preliminary Class

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier

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license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/896,993	10/04/2010	David Astely	4015-6942 / P30138-US2

CONFIRMATION NO. 1015

24112
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

FORMALITIES LETTER

OC000000044046247

Date Mailed: 10/20/2010

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**130** for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**130** for a non-small entity
- $**130** Surcharge.

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Replies should be mailed to:

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P.O. Box 1450
Alexandria VA 22313-1450

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https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/smunpanthovong/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **Astely** *et al.*	)	
	)	PATENT PENDING
Serial No.: **12/896,993**	)	
	)	Examiner:
Filed: **October 4, 2010**	)	
	)	Group Art Unit:
For: **PUCCH Resource Allocation for Carrier Aggregation for LTE-Advanced**	)	
	)	Confirmation No.: 1015
Docket No: **4015-6942**	)	

Mail Stop MISSING PARTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

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☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (571) 273-8300.

December 20, 2010 — Date

Kathleen Koppen

This correspondence is being:

☒ electronically submitted via EFS-Web

Sir:

In response to the Notice to File Missing Parts of Application, please find enclosed the signed Declaration and Power of Attorney for Patent Application. Payment in the amount of $130 to cover the surcharge for the incomplete filing is being concurrently submitted with this electronic submission. If additional fees are required, please deduct from the Coats & Bennett, P.L.L.C. Deposit Account No. 18-1167.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

David E. Bennett

Dated: December 20, 2010

David E. Bennett
Registration No.: 32,194

1400 Crescent Green, Suite 300
Cary, NC 27518
Telephone: (919) 854-1844
Facsimile: (919) 854-2084

RULE 63 (37 C.F.R. 1.63)

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **PUCCH RESOURCE ALLOCATION FOR CARRIER AGGREGATION FOR LTE-ADVANCED,** the specification of which (check applicable box(es)):

☐ is attached hereto;
☒ was filed on October 4, 2010 as U.S. Application Serial No. 12/896,993
☐ was filed as PCT international application No. PCT/_____/_____ on _____ and (if applicable to U.S. or PCT application) was amended on _____.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 C.F.R. 1.56.

I hereby claim priority benefits under 35 U.S.C. 119/365 of any U.S. Provisional or foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed or, if no priority is claimed before the filing date of this application:

Prior U.S. Provisional or Foreign Application(s):

Application Number	Country	Day/Month/Year Filed
61/248,661	US	05/Oct/2009

I hereby claim the benefit under 35 U.S.C. 120/365 of all prior United States and PCT international applications listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in such prior application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. 1.56 which occurred between the filing date of the prior applications and the national or PCT international filing date of this application:

Prior U.S./PCT Application(s):

Prior Application Serial No.	Day/Month/Year Filed	Status: patented, pending, abandoned

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine

or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Further, I hereby appoint the Attorneys and Patent Agents of **Coats & Bennett, PLLC** as identified by **Customer Number 24112** in the records of the United States Patent and Trademark Office and as updated from time to time, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. Direct all correspondence to David E. Bennett:

24112

INVENTOR SIGNATURE(S):

Full Name: **David** (First Name) Middle Name/Initial **Astely** (Last Name)

Signature: _____ Date: 2010-11-29

Residence: Bromma, Sweden
City, State, and Country

Citizenship: Sweden

Post Office Address: Stobaeusvägen 22
SE-168 56 Bromma
Sweden

Full Name: **Robert** (First Name) Middle Name/Initial **Baldemair** (Last Name)

Signature: _____ Date: _____

Residence: Solna, Sweden
City, State, and Country

Citizenship: Austria

Post Office Address: Ängkärrsgatan 3
SE-171 10 Solna
Sweden

or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Further, I hereby appoint the Attorneys and Patent Agents of **Coats & Bennett, PLLC** as identified by **Customer Number 24112** in the records of the United States Patent and Trademark Office and as updated from time to time, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. Direct all correspondence to David E. Bennett:

24112

INVENTOR SIGNATURE(S):

Full Name: **David** (First Name) (Middle Name/Initial) **Astely** (Last Name)

Signature: _____ Date: _____

Residence: Bromma, Sweden
City, State, and Country

Citizenship: Sweden

Post Office Address: Stobaeusvägen 22
SE-168 56 Bromma
Sweden

Full Name: **Robert** (First Name) (Middle Name/Initial) **Baldemair** (Last Name)

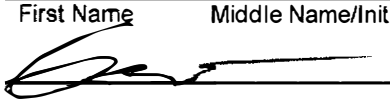
Signature: _____ Date: 2010-12-20

Residence: Solna, Sweden
City, State, and Country

Citizenship: Austria

Post Office Address: Ängkärrsgatan 3
SE-171 10 Solna
Sweden

Full Name: **Dirk** **Gerstenberger**
First Name Middle Name/Initial Last Name

Signature:  Date: 2010-10-18

Residence: Stockholm, Sweden
City, State, and Country

Citizenship: Germany

Post Office Address: Birger Jarlsgatan 113 C
SE-113 56 Stockholm
Sweden

Full Name: **Daniel** **Larsson**
First Name Middle Name/Initial Last Name

Signature: Date: 2010-10-18

Residence: Solna, Sweden
City, State, and Country

Citizenship: Sweden

Post Office Address: Storgatan 50
SE-171 52, Solna
Sweden

Full Name: **Lars** **Lindbom**
First Name Middle Name/Initial Last Name

Signature: _____ Date: _____

Residence: Karlstad, Sweden
City, State, and Country

Citizenship: Sweden

Post Office Address: Fogdegatan 7
SE-654 62 Karlstad
Sweden

Full Name: **Dirk** **Gerstenberger**
First Name Middle Name/Initial Last Name

Signature: _____ Date: _____

Residence: Stockholm, Sweden
City, State, and Country

Citizenship: Germany

Post Office Address: Birger Jarlsgatan 113 C
SE-113 56 Stockholm
Sweden

Full Name: **Daniel** **Larsson**
First Name Middle Name/Initial Last Name

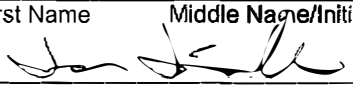
Signature: _____ Date: _____

Residence: Solna, Sweden
City, State, and Country

Citizenship: Sweden

Post Office Address: Storgatan 50
SE-171 52, Solna
Sweden

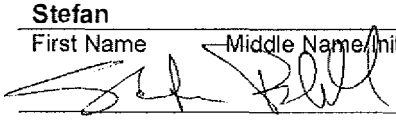
Full Name: **Lars** **Lindbom**
First Name Middle Name/Initial Last Name

Signature:  Date: 4 Nov 2010

Residence: Karlstad, Sweden
City, State, and Country

Citizenship: Sweden

Post Office Address: Fogdegatan 7
SE-654 62 Karlstad
Sweden

Full Name:	**Stefan**		**Parkvall**
	First Name	Middle Name/Initial	Last Name
Signature:			Date: Oct 18, 2010
Residence:	Stockholm, Sweden		
	City, State, and Country		
Citizenship:	Sweden		
Post Office Address:	Västmannagatan 53 SE-113 25 Stockholm Sweden		

Electronic Patent Application Fee Transmittal

Application Number:	12896993
Filing Date:	04-Oct-2010
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Filer:	David E. Bennett/Kathleen Koppen
Attorney Docket Number:	4015-6942 / P30138-US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**130**

Electronic Acknowledgement Receipt

EFS ID:	9069606
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	David E. Bennett/Kathleen Koppen
Filer Authorized By:	David E. Bennett
Attorney Docket Number:	4015-6942 / P30138-US2
Receipt Date:	20-DEC-2010
Filing Date:	04-OCT-2010
Time Stamp:	09:07:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$130
RAM confirmation Number	8408
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		4015-6942missingparts.pdf	232480 379672ca0969b50788216999675e819b09c309ae	yes	7

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Miscellaneous Incoming Letter	1	1
Oath or Declaration filed	2	7

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	29909 8906dce227a43a1b310c7c2de8be56d0dec63fd	no	2

Warnings:

Information:

Total Files Size (in bytes):	262389

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/896,993	10/04/2010		2608	4015-6942	34	6

CONFIRMATION NO. 1015

UPDATED FILING RECEIPT

24112
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

OC000000045156478

Date Mailed: 12/29/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

David Astely, Bromma, SWEDEN;
Robert Baldemair, Solna, SWEDEN;
Dirk Gerstenberger, Stockholm, SWEDEN;
Daniel Larsson, Solna, SWEDEN;
Lars Lindbom, Karlstad, SWEDEN;
Stefan Parkvall, Stockholm, SWEDEN;

Assignment For Published Patent Application

Telefonaktiebolaget L M Ericsson (publ), Stockholm, SWEDEN

Power of Attorney: The patent practitioners associated with Customer Number 24112

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/248,661 10/05/2009

Foreign Applications

If Required, Foreign Filing License Granted: 10/18/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/896,993**

Projected Publication Date: 04/07/2011

Non-Publication Request: No

Early Publication Request: No

IPR2022-00648
Apple EX1005 Page 71

Title

PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced

Preliminary Class

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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Apple EX1005 Page 72

license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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Apple EX1005 Page 73

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/896,993

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	330
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	34 minus 20 =	* 14			OR	x 52 =	728
INDEPENDENT CLAIMS (37 CFR 1.16(h))	6 minus 3 =	* 3				x 220 =	660
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2478

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/896,993	10/04/2010	David Astely	4015-6942

CONFIRMATION NO. 1015

24112
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

PUBLICATION NOTICE

OC000000047008401

Title:PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced

Publication No.US-2011-0081932-A1
Publication Date:04/07/2011

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

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Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2022-00648
Apple EX1005 Page 75

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12896993
Filing Date	2010-10-04
First Named Inventor	Astely, David
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	4015-6942

U.S.PATENTS Remove

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12896993
	Filing Date	2010-10-04
	First Named Inventor	Astely, David
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	4015-6942

	1	3RD GENERATION PARTNERSHIP PROJECT, MOTOROLA (source), "Control Signalling Design for Supporting Carrier Aggregation," 3GPP TSG RANI #56, R1-090792, Athens, GR, Feb. 9-13, 2009.	☐
	2	3RD GENERATION PARTNERSHIP PROJECT, ZTE (source), "Uplink Control Channel Design for LTE-Advanced," TSG-RAN WG1 #58, R1-093209, Shenzhen, China, June 25 - Aug. 29, 2009.	☐
	3	3RD GENERATION PARTNERSHIP PROJECT, NOKIA, NOKIA SIEMENS NETWORKS (source), "L1 Control Signaling with Carrier Aggregation in LTE-Advanced," 3GPP TSG-RAN WG1 Meeting #54bis, R1-083730, Prague, Czech Republic, Sept. 29 - October 3, 2008.	☐
	4	3RD GENERATION PARTNERSHIP PROJECT, NOKIA SIEMENS NETWORKS, NOKIA (source), "Channelization of SRI and Persistent ACK/NACK on PUCCH," 3GPP TSG RAN WG1 Meeting #52bis, R1-081460, Shenzhen, China, March 31 - April 4, 2008.	☐
	5	3RD GENERATION PARTNERSHIP PROJECT, QUALCOMM EUROPE, "Clarifying PUSCH Resource Allocation," 3GPP TSG-RAN WG1 Meeting #54, R1-083181, Jeju, Korea, August 18-22, 2008.	☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12896993
	Filing Date	2010-10-04
	First Named Inventor	Astely, David
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	4015-6942

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/David E. Bennett, Reg. No. 32194/	Date (YYYY-MM-DD)	2011-06-23
Name/Print	David E. Bennett	Registration Number	32194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	10369476
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	David E. Bennett/Wendy Henshaw
Filer Authorized By:	David E. Bennett
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Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	4015-6942_IDS_Coverletter.pdf	53215 3b25a31fc4e68487ee47d2ff3ea4e6965725 5d0	no	1

Warnings:	
Information:	

2	Non Patent Literature	R1-081460.pdf	181211 5853e37865b3fd52172669ee22eeb2b8eff58b9f	no	5
Warnings:					
Information:					
3	Non Patent Literature	R1-083181.pdf	201926 a00057537bf9767faae47e530bf905164c920485	no	5
Warnings:					
Information:					
4	Non Patent Literature	R1-083730.pdf	280956 a56f1810d80e9a59648152e614f052b8bba339f7	no	6
Warnings:					
Information:					
5	Non Patent Literature	R1-090792.pdf	207218 e5c1a07402b725272039aa3aa3502fc195135176	no	8
Warnings:					
Information:					
6	Non Patent Literature	R1-093209.pdf	144743 bc2ce4917a5076000482e158e80b4068046f7ec7	no	4
Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Form (SB08)	4015-6942_IDS.pdf	612178 ddb22a35dcf24af56e2da0570f88010b8d5e5636	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

Total Files Size (in bytes):	1681447

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **Astely et al.**	)	
Serial No.: **12/896993**	)	PATENT PENDING
Filed: **October 4, 2010**	)	Examiner:
For: **PUCCH Resource Allocation for Carrier Aggregation for LTE-Advanced**	)	Group Art Unit:
Attorney's Docket No: **4015-6942**	)	Confirmation No.: 1015

MS AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

In accordance with 37 C.F.R. 1.56, counsel wishes to make of record the attached items of information for the Examiner's consideration in connection with this application. Also enclosed is Form PTO/SB/08a for the Examiner's convenience in making such consideration of record. Inclusion herein of any particular item of information is not to be construed as an admission that same is prior art.

The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to Deposit Account 18-1167.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

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Dated: June 23, 2011

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942	1015

24112 7590 12/19/2012
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER	
TALUKDER, MD K	

ART UNIT	PAPER NUMBER
2648	

MAIL DATE	DELIVERY MODE
12/19/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/896,993	ASTELY ET AL.	
	Examiner	Art Unit	
	MD TALUKDER	2648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-34* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-34* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *04 October 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/23/2011.*

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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1. It would be of great assistance to the office if all incoming papers pertaining to a filed application carried the following items:

i. Application number (checked for accuracy, including series code and serial no.).
ii. Group art unit number (copied from most recent Office communication).
iii. Filing date.
iv. Name of the examiner who prepared the most recent Office action.
v. Title of invention.
vi. Confirmation number (See MPEP § 503).

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on (06 /23/2011) is being considered by the examiner.

Claim Rejection- 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-34 are rejected under 35 USC 102(e) as being anticipated by Bala (Pub No. US 2010/0098012).

Regarding Claim 1, Bala teaches a method implemented by a base station of receiving control information from a user terminal (**Fig. 1**), the method comprising: scheduling downlink transmissions to said user terminal on one or more downlink component carriers ((Fig. 2: **the controller of the eNB schedule downlink transmission**. see Para. 25, 26, 38 & 55 and Para. 38:

"**In another embodiment for mapping of CQI, PMI and RI to physical resource elements in carrier aggregation, the PUCCH that carries the CQI (and any other possible control information such as scheduling request, ACK/NACK, etc.) is transmitted on more than one uplink component carrier. In an example method for transmission on more than one uplink carrier, there is one PUCCH per UL component carrier carrying control information corresponding to one DL component carrier**"); if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier; and if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier (**The terminal schedule to receive downlink transmissions on single downlink component carrier, receiving control information a set of radio resources on a uplink primary component carrier associated with said first downlink component carrier and receive other downlink component and control information on a different set of radio resources (RB-resource block).** see Para, **25** and **32-39, 103-14**). (Para. 37: "**The control information for each downlink carrier may be transmitted by using different RBs, different spreading sequences/cyclic shifts or a combination of these. As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may**

be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB") (Fig. **5-7:** PUCCH resource block allocations).

Regarding Claim 2, Bala, remains as applied above and continues to teach transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier (Para. 107-108: "**Disclosed herein are implementation embodiments to configure uplink data channel for transmitting UCI. In Release 8 LTE, the periodic CQI reporting mode is given by the parameter, cqi-Format Indicator Periodic which is configured by higher-layer signaling. In one example, the periodic PUSCH-based CQI reporting mode is given by the parameter X e.g., cqi-Format Indicator Periodic PUSCH which is configured by higher-layer signaling. Depending on transmission mode, reporting mode is implicitly given. In another method, the periodic PUSCH-based CQI reporting mode is given by the parameter Y e.g., cqi-R eport Mode Periodic PUSCH which is configured by higher-layer signaling. Reporting mode is explicitly given via this parameter**").

Regarding Claim 3, Bala continues to teach transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier (See Para. 37 and 107-108 above) (Next available resource blocks is the second set of radio resources).

Regarding Claim 4, Bala continues to teach that the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier (Para. 32-33: "**…Alternatively, these WTRUs may be required to report wideband CQI/PMI/RI which requires a smaller number of bits or these WTRUs may be configured to use more subframes to transmit the whole control information. For example, in one subframe, the WTRU may transmit the control information corresponding to only one downlink component carrier and complete transmitting the control information corresponding to all component carriers in several subframes. For example, in subframe 1, the WTRU may transmit control information for downlink component carrier #1, and then in subframe 2, the WTRU may transmit the control information for downlink component carrier # 2, etc. The WTRU configuration may be performed with L1 or L2/L3 signaling. The carrier (or spectrum) edge resource blocks (RBs) may be used for control data transmission when an LTE-A network is configured to use LTE uplink control channel structure, as shown in FIG. 3. As shown in FIG. 3 for LTE Release 8, the WTRU uses two different RBs in the two time slots. For example, the RB indexed with m=1 is used by one WTRU, and m=1 is on opposite edges of the frequency in the two time slots. RBs on opposite edges of the spectrum may be used in two time slots for maximum frequency diversity. In this case, LTE-A and LTE Release 8 WTRUs may be configured to share the same PUCCH resources within the uplink (UL) carrier**") (Also see Para. 46). (Note: sending terminal identifier information is well known technique in this art).

Regarding Claim 5, Bala teaches at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 48: "**In another reporting example, L1, L2/3, or broadcast signaling may be transmitted to the WTRU indicating which carriers are associated carriers within the LTE-A aggregation for which it should report carrier wide CQI/PMI/RI. The WTRU may be configured to transmit a network defined set of wideband CQI reports. Carrier wide is meant to cover the fact that "associated carriers" may mean multiple carriers and we want to report for all. In addition, separate reports for each of these component carriers may be sent**"). (Also see Para. 107-108) (See Fig. 3, 5 and 7).

Regarding Claim 6, Bala teaches the explicit indication is transmitted as radio resource control signaling (See Abstract. Transmitting uplink control information- UCI and using resource blocks- RBs).

Regarding Claim 7, Bala teaches transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources; etc. may be changed in the next reporting instance. This may achieve scheduling gain for each reporting instance. PDCCH may be transmitted in every interval. In this case RB allocation may be changed dynamically in each scheduled**

reporting interval for periodic PUSCH. The WTRU may monitor PDCCH for periodic PUSCH in each scheduled reporting interval. The base station may or may not transmit PDCCH corresponding to periodic PUSCH in every scheduled interval. Periodic PUSCH (control) and PUSCH (data) may merge on PUSCH resources and share the grant. CQI request bit may be used to indicate if the grant received in the scheduled reporting interval is applied to periodic PUSCH (control) only or applied to both periodic PUSCH (control) and PUSCH (data)"). (Also see Fig. 5-7 and Para. 32-38). (Also see Fig. 5-7 and Para. 32-38). (For acknowledgement indication see Para. 6).

Regarding Claim 8, Bala teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 43, 89, 95 and Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources, etc…**").

Regarding Claim 9, Bala teaches a base station comprising: a transmitter to transmit user data on one or more downlink component carriers to a user terminal (**Fig. 2:** Transmitter of the BS 120 transmits user data on component carriers); a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to schedule downlink transmissions to a user terminal on one or more downlink component carriers (Fig. 2: **the controller of the eNB schedule downlink transmission**. see Para. 25, 26, 38 & 55); if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with

said first downlink component carrier; and if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier (**The terminal schedule to receive downlink transmissions on single downlink component carrier, receiving control information a set of radio resources on a uplink primary component carrier associated with said first downlink component carrier and receive other downlink component and control information on a different set of radio resources (RB-resource block).** see Para, **25** and **32-39, 103-14**). (Para. 37: "**The control information for each downlink carrier may be transmitted by using different RBs, different spreading sequences/cyclic shifts or a combination of these. As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB**") (Fig. **5-7:** PUCCH resource block allocations).

Regarding Claim 10, Bala teaches that the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier (Para. 107-108: "**Disclosed herein are implementation embodiments to configure uplink data**

channel for transmitting UCI. In Release 8 LTE, the periodic CQI reporting mode is given by the parameter, cqi-Format Indicator Periodic which is configured by higher-layer signaling. In one example, the periodic PUSCH-based CQI reporting mode is given by the parameter X e.g., cqi-Format Indicator Periodic PUSCH which is configured by higher-layer signaling. Depending on transmission mode, reporting mode is implicitly given. In another method, the periodic PUSCH-based CQI reporting mode is given by the parameter Y e.g., cqi-R eport Mode Periodic PUSCH which is configured by higher-layer signaling. Reporting mode is explicitly given via this parameter").

Regarding Claim 11, Bala continues to teach that the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier (See Para. 37 and 107-108 above) (Next available resource blocks is the second set of radio resources).

Regarding Claim 12, Bala continues to teach that the controller is further configured to indicate the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier (Para. 32-33: "**…Alternatively, these WTRUs may be required to report wideband CQI/PMI/RI which requires a smaller number of bits or these WTRUs may be configured to use more subframes to transmit the whole control information. For example, in one subframe, the WTRU may transmit the control information corresponding to only one downlink component carrier and complete transmitting the control information corresponding to all component carriers in several subframes. For example, in subframe 1,**

the WTRU may transmit control information for downlink component carrier #1, and then in subframe 2, the WTRU may transmit the control information for downlink component carrier # 2, etc. The WTRU configuration may be performed with L1 or L2/L3 signaling. The carrier (or spectrum) edge resource blocks (RBs) may be used for control data transmission when an LTE-A network is configured to use LTE uplink control channel structure, as shown in FIG. 3. As shown in FIG. 3 for LTE Release 8, the WTRU uses two different RBs in the two time slots. For example, the RB indexed with m=1 is used by one WTRU, and m=1 is on opposite edges of the frequency in the two time slots. RBs on opposite edges of the spectrum may be used in two time slots for maximum frequency diversity. In this case, LTE-A and LTE Release 8 WTRUs may be configured to share the same PUCCH resources within the uplink (UL) carrier") (Also see Para. 46). (Note: sending terminal identifier information is well known technique in this art).

Regarding Claim 13, Bala teaches that the controller is further configured to indicate the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 48: "**In another reporting example, L1, L2/3, or broadcast signaling may be transmitted to the WTRU indicating which carriers are associated carriers within the LTE-A aggregation for which it should report carrier wide CQI/PMI/RI. The WTRU may be configured to transmit a network defined set of wideband CQI reports. Carrier wide is meant to cover the fact that "associated carriers" may mean multiple carriers and we want to report for all. In addition, separate reports for each of these component carriers may be sent**"). (Also see Para. 107-108) (See Fig. 3, 5 and 7).

Regarding Claim 14, Bala teaches that the controller is further configured to send the explicit indication is transmitted as radio resource control signaling (See Abstract. Transmitting UCI).

Regarding Claim 15, Bala teaches that the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources; etc. may be changed in the next reporting instance. This may achieve scheduling gain for each reporting instance. PDCCH may be transmitted in every interval. In this case RB allocation may be changed dynamically in each scheduled reporting interval for periodic PUSCH. The WTRU may monitor PDCCH for periodic PUSCH in each scheduled reporting interval. The base station may or may not transmit PDCCH corresponding to periodic PUSCH in every scheduled interval. Periodic PUSCH (control) and PUSCH (data) may merge on PUSCH resources and share the grant. CQI request bit may be used to indicate if the grant received in the scheduled reporting interval is applied to periodic PUSCH (control) only or applied to both periodic PUSCH (control) and PUSCH (data)**"). (Also see Fig. 5-7 and Para. 32-38).

Regarding Claim 16, Bala teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 43, 89, 95 and Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources, etc…**").

Regarding Claim 17, Bala teaches a method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising: receiving an assignment of radio resources for downlink transmissions from a base station (**Fig. 2:** the BS 120 assign/allocate radio resources. Para. 28: "**The number of downlink carriers for each WTRU may be different, resulting in N being different. The code orthogonality may not be maintained if the same set of resource blocks (RBs) are used for all WTRUs each having different N. In this case, different sets of RBs may be allocated for different sequence lengths**"); transmitting control information associated with the downlink transmissions on a first set of radio resources on an uplink component carrier if an assignment of single downlink component carrier for the downlink transmission is received; an transmitting control information associated with the downlink transmissions on a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component for the downlink transmission is received (**The terminal schedule to receive downlink transmissions on single downlink component carrier, receiving control information a set of radio resources on a uplink primary component carrier associated with said first downlink component carrier and receive other downlink component and control information on a different set of radio resources (RB-resource block).** see Para, **25** and **32-39, 103-14**). (Para. 37: "**The control**

information for each downlink carrier may be transmitted by using different RBs, different spreading sequences/cyclic shifts or a combination of these. As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB") (Fig. **5-7:** PUCCH resource block allocations).

Regarding Claim 18, Bala teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. 37: "**As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB**"). So the system using second set of resource block RB for the signal downlink component carrier.

Regarding Claim 19, Bala teaches receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio

resources on the uplink primary component carrier (See Para. 37 and 107-108 above) (Next available resource blocks is the second set of radio resources).

Regarding Claim 20, Bala teaches receiving control information comprises receiving one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources (Para. 32-33: "**…Alternatively, these WTRUs may be required to report wideband CQI/PMI/RI which requires a smaller number of bits or these WTRUs may be configured to use more subframes to transmit the whole control information. For example, in one subframe, the WTRU may transmit the control information corresponding to only one downlink component carrier and complete transmitting the control information corresponding to all component carriers in several subframes. For example, in subframe 1, the WTRU may transmit control information for downlink component carrier #1, and then in subframe 2, the WTRU may transmit the control information for downlink component carrier # 2, etc. The WTRU configuration may be performed with L1 or L2/L3 signaling. The carrier (or spectrum) edge resource blocks (RBs) may be used for control data transmission when an LTE-A network is configured to use LTE uplink control channel structure, as shown in FIG. 3. As shown in FIG. 3 for LTE Release 8, the WTRU uses two different RBs in the two time slots. For example, the RB indexed with m=1 is used by one WTRU, and m=1 is on opposite edges of the frequency in the two time slots. RBs on opposite edges of the spectrum may be used in two time slots for maximum frequency diversity. In this case, LTE-A and LTE Release 8 WTRUs may be configured to share the same PUCCH resources within the**

uplink (UL) carrier") (Also see Para. 46). (Note: sending terminal identifier information is well known technique in this art).

Regarding Claim 21, Bala teaches receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources (Para. 48: "**In another reporting example, L1, L2/3, or broadcast signaling may be transmitted to the WTRU indicating which carriers are associated carriers within the LTE-A aggregation for which it should report carrier wide CQI/PMI/RI. The WTRU may be configured to transmit a network defined set of wideband CQI reports. Carrier wide is meant to cover the fact that "associated carriers" may mean multiple carriers and we want to report for all. In addition, separate reports for each of these component carriers may be sent**"). (Also see Para. 107-108) (See Fig. 3, 5 and 7).

Regarding Claim 22, Bala teaches the explicit indication is received as radio resource control signaling (See Abstract. Transmitting uplink control information UCI).

Regarding Claim 23, Bala teaches receiving, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources; etc. may be changed in the next reporting instance. This may achieve scheduling gain for each reporting instance. PDCCH may be transmitted in every**

interval. In this case RB allocation may be changed dynamically in each scheduled reporting interval for periodic PUSCH. The WTRU may monitor PDCCH for periodic PUSCH in each scheduled reporting interval. The base station may or may not transmit PDCCH corresponding to periodic PUSCH in every scheduled interval. Periodic PUSCH (control) and PUSCH (data) may merge on PUSCH resources and share the grant. CQI request bit may be used to indicate if the grant received in the scheduled reporting interval is applied to periodic PUSCH (control) only or applied to both periodic PUSCH (control) and PUSCH (data)"). (Also see Fig. 5-7 and Para. 32-38). (For acknowledgement indication see Para. 6).

Regarding Claim 24, Bala teaches that the method further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication (Para. 43, 89, 95 and Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources, etc…**").

Regarding Claim 25, Bala teaches a user terminal for mobile communications, the user terminal comprising: a receiver to receive downlink transmissions from a base station (Fig. 2: **transceiver 214 receives downlink transmission from the eNB-120**); a transmitter to transmit control information associated with the downlink transmission to a base station (**Fig. 2 transceiver 221 transmit control information. See Para. 32**); and a controller to select radio resources for transmission of control information associated with the downlink transmissions (Fig. 2: **the controller of the eNB schedule downlink transmission**. see Para. 25, 26, 38 & 55);

(Para. 38: "**In another embodiment for mapping of CQI, PMI and RI to physical resource elements in carrier aggregation, the PUCCH that carries the CQI (and any other possible control information such as scheduling request, ACK/NACK, etc.) is transmitted on more than one uplink component carrier. In an example method for transmission on more than one uplink carrier, there is one PUCCH per UL component carrier carrying control information corresponding to one DL component carrier**"); the controller configured to: select a first set of radio resources on an uplink component carrier if an assignment of a single downlink component carrier for the downlink transmission is received; and select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received **(RB-resource blocks.** see Para, **25** and **32-39, 103-14)**. (Para. 37: "**The control information for each downlink carrier may be transmitted by using different RBs, different spreading sequences/cyclic shifts or a combination of these. As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB**") (Fig. **5-7:** PUCCH resource block allocations).

Regarding Claim 26, Bala teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para.

37: "**As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB**"). So the system using second set of resource block RB for the signal downlink component carrier.

Regarding Claim 27, Bala teaches receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink primary component carrier (See Para. 37 and 107-108 above) (Next available resource blocks is the second set of radio resources).

Regarding Claim 28, Bala teaches receiving control information comprises receiving one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources (Para. 32-33: "**…Alternatively, these WTRUs may be required to report wideband CQI/PMI/RI which requires a smaller number of bits or these WTRUs may be configured to use more subframes to transmit the whole control information. For example, in one subframe, the WTRU may transmit the control information corresponding to only one downlink component carrier and complete transmitting the control information corresponding to all component carriers in several subframes. For example, in subframe 1, the WTRU may transmit control information for downlink component carrier #1, and then in subframe 2,**

the WTRU may transmit the control information for downlink component carrier # 2, etc. The WTRU configuration may be performed with L1 or L2/L3 signaling. The carrier (or spectrum) edge resource blocks (RBs) may be used for control data transmission when an LTE-A network is configured to use LTE uplink control channel structure, as shown in FIG. 3. As shown in FIG. 3 for LTE Release 8, the WTRU uses two different RBs in the two time slots. For example, the RB indexed with m=1 is used by one WTRU, and m=1 is on opposite edges of the frequency in the two time slots. RBs on opposite edges of the spectrum may be used in two time slots for maximum frequency diversity. In this case, LTE-A and LTE Release 8 WTRUs may be configured to share the same PUCCH resources within the uplink (UL) carrier") (Also see Para. 46). (Note: sending terminal identifier information is well known technique in this art).

Regarding Claim 29, Bala teaches receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources on the uplink primary component carrier (Para. 48: "**In another reporting example, L1, L2/3, or broadcast signaling may be transmitted to the WTRU indicating which carriers are associated carriers within the LTE-A aggregation for which it should report carrier wide CQI/PMI/RI. The WTRU may be configured to transmit a network defined set of wideband CQI reports. Carrier wide is meant to cover the fact that "associated carriers" may mean multiple carriers and we want to report for all. In addition, separate reports for each of these component carriers may be sent**"). (Also see Para. 107-108) (See Fig. 3, 5 and 7).

Regarding Claim 30, Bala teaches the explicit indication is received as radio resource control signaling (See Abstract. Transmitting uplink control information UCI).

Regarding Claim 31, Bala teaches receiving, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources; etc. may be changed in the next reporting instance. This may achieve scheduling gain for each reporting instance. PDCCH may be transmitted in every interval. In this case RB allocation may be changed dynamically in each scheduled reporting interval for periodic PUSCH. The WTRU may monitor PDCCH for periodic PUSCH in each scheduled reporting interval. The base station may or may not transmit PDCCH corresponding to periodic PUSCH in every scheduled interval. Periodic PUSCH (control) and PUSCH (data) may merge on PUSCH resources and share the grant. CQI request bit may be used to indicate if the grant received in the scheduled reporting interval is applied to periodic PUSCH (control) only or applied to both periodic PUSCH (control) and PUSCH (data)**"). (Also see Fig. 5-7 and Para. 32-38). (For acknowledgement indication see Para. 6).

Regarding Claim 32, Bala teaches that the method further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the

acknowledgement resource indication (Para. 43, 89, 95 and Para. 104: "**In an example method, a semi-static indication is used. In this method, PDCCH is used to indicate resources, etc. for periodic PUSCH not only in the beginning but also in the subsequent reporting intervals. In other words parameters such as resources, etc…**").

Regarding Claim 33, Bala teaches a method implemented by a user terminal in a mobile communication network, the method comprising: receiving an assignment of radio resources for a downlink transmission from a base station (**Fig. 2:** the BS 120 assign/allocate radio resources. Para. 28: "**The number of downlink carriers for each WTRU may be different, resulting in N being different. The code orthogonality may not be maintained if the same set of resource blocks (RBs) are used for all WTRUs each having different N. In this case, different sets of RBs may be allocated for different sequence lengths**"); transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink component carrier if an assignment of a first downlink component carrier for the downlink transmission is received; and transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received (**The terminal schedule to receive downlink transmissions on single downlink component carrier, receiving control information a set of radio resources on a uplink primary component carrier associated with said first downlink component carrier and receive other downlink component and control information on a different set of radio resources (RB-resource block).** see Para, **25** and **32-39, 103-14**). (Para. 37: "**The control information for each downlink carrier may be transmitted by using different RBs, different spreading**

sequences/cyclic shifts or a combination of these. As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB") (Fig. **5-7:** PUCCH resource block allocations).

Regarding Claim 34, Bala teaches a user terminal for mobile communications, the user terminal comprising: a receiver to receive downlink transmissions from a base station (Fig. 2: **transceiver 214 receives downlink transmission from the eNB-120**); a transmitter to transmit control information associated with the downlink transmission to a base station **(Fig. 2 transceiver 221 transmit control information. See Para. 32)**; a controller to select radio resources for transmission of control information associated with downlink transmission (Fig. 2: **the controller of the eNB schedule downlink transmission**. see Para. 25, 26, 38 & 55) (Para. 38: "**In another embodiment for mapping of CQI, PMI and RI to physical resource elements in carrier aggregation, the PUCCH that carries the CQI (and any other possible control information such as scheduling request, ACK/NACK, etc.) is transmitted on more than one uplink component carrier. In an example method for transmission on more than one uplink carrier, there is one PUCCH per UL component carrier carrying control information corresponding to one DL component carrier**"); the controller configured to select a first set of radio resources on an uplink component carrier if an assignment of a first

downlink component carrier for the downlink transmission is received; an select a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received (**RB-resource blocks.** see Para, **25** and **32-39, 103-14**). (Para. 37: "**The control information for each downlink carrier may be transmitted by using different RBs, different spreading sequences/cyclic shifts or a combination of these. As an example, RBs m=1 and m=3 may be used for control data transmission corresponding to two different downlink carriers. In this case, the mapping of the control data resources (frequency, sequence, cyclic shift) to the downlink carriers may be performed with L1 and/or L2/L3 signaling. This mapping may also be performed implicitly by using mapping rules. For example, the CQI for the second downlink carriers may be transmitted with the same spreading sequence/cyclic shift pair as for the first downlink carriers but on the next available RB**") (Fig. **5-7:** PUCCH resource block allocations).

CONCLUSION

Any inquiry concerning this communication from the examiner should be directed to Patent Examiner Md Talukder whose telephone number is (571) 270-3222. The examiner can normally be reached on Mon-Th 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Ghebretinsae, Temesghen can be reached on (571) 272-3017.

Information regarding the status of an application may be obtaining from the patent application information retrieval (PAIR) system. Status information for the published

applications may be obtained from either private PAIR or public PAIR. Status information for unpublished application is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the private PAIR system, contract the Electronics Business Center (EBC) at 866-217-9197. If you would like assistance from USPTO customer service representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA).

/ Md. Talukder /

/ Art Unit # 2648 /

/TEMESGHEN GHEBRETINSAE/

Supervisory Patent Examiner, Art Unit 2648

12/17/12R

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2012/0140708	06-2012	Choudhury et al.	370/328
*	B	US-2010/0098012	04-2010	Bala et al.	370/329
*	C	US-2012/0082125	04-2012	Huang, Yada	370/329
*	D	US-2011/0310856	12-2011	Hariharan et al.	370/336
*	E	US-2012/0020317	01-2012	Ishii et al.	370/329
*	F	US-2010/0232373	09-2010	Nory et al.	370/329
*	G	US-8,265,030	09-2012	Miki et al.	370/330
	H	US-			
	I	US-			
	J	US-			
	K	US-			
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	M	US-			

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

SEARCHED

Class	Subclass	Date	Examiner
455	509,522,456.6,137,103,575	12/11/2012	Talukder
370	329,252,331	12/11/2012	Talukder

SEARCH NOTES

Search Notes	Date	Examiner
East Search	12/10/2012	talukder
East Search	12/11/2012	talukder

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

IPR2022-00648
Apple EX1005 Page 110

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12896993
Filing Date	2010-10-04
First Named Inventor	Astely, David
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	4015-6942

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Receipt date: 06/23/2011	Application Number	12896993	12896993 - GAU: 2648
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2010-10-04	
	First Named Inventor	Astely, David	
	Art Unit	TBD	
	Examiner Name	TBD	
	Attorney Docket Number	4015-6942	

/M.T./	1	3RD GENERATION PARTNERSHIP PROJECT, MOTOROLA (source), "Control Signalling Design for Supporting Carrier Aggregation," 3GPP TSG RANI #56, R1-090792, Athens, GR, Feb. 9-13, 2009.	☐
/M.T./	2	3RD GENERATION PARTNERSHIP PROJECT, ZTE (source), "Uplink Control Channel Design for LTE-Advanced," TSG-RAN WG1 #58, R1-093209, Shenzhen, China, June 25 - Aug. 29, 2009.	☐
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/M.T./	4	3RD GENERATION PARTNERSHIP PROJECT, NOKIA SIEMENS NETWORKS, NOKIA (source), "Channelization of SRI and Persistent ACK/NACK on PUCCH," 3GPP TSG RAN WG1 Meeting #52bis, R1-081460, Shenzhen, China, March 31 - April 4, 2008.	☐
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EXAMINER SIGNATURE

Examiner Signature	/Md Talukder/	Date Considered	12/13/2012

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"12896993"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 17:09
S2	367	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:04
S3	176	S2 and (radio near3 resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S4	28	S2 and (radio near3 resource) and (component with carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S5	173	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S6	137	S5 and (scheduling)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S7	36	("20120263121" | "20110310856" | "20120127950" | "20110310819 " | "20120275395" | "20120287828" | "20120039291" | "20100271970" | "20120307781" | "20110286436" | "20120224535" | "20120140708" | "20110310820" | "20120163288" | "20110299486" | "20100098012" | "20120082125 " | "20120294273" | "20110268048" | "20120113910").pn.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:15
S8	127	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (carrier adj aggregation)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 10:16
S9	2	"20110292887"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:17

S11	25	((first 1st) adj6 component adj3 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:22
S12	1718	((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S13	66	(carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S14	10842	455/509,522,456.6,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S15	28232	370/329,252,331.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S16	102	(S14 S15) and (downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:42
S17	1	"13140333"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S18	2	"20110310856"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S19	38	((first 1st) adj6 component adj3 carrier) same ((radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S20	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S21	27	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj4 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S22	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32

S23	24	(carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:48
S24	8	("7551898" | "7649960" | "7656843" | "7773699").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:14
S25	2	"20110292900"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:36
S26	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:37
S27	3	"8050202"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:38
S28	1	"20120307689"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:45
S29	2	"8160017"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S30	2	"20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S31	2	"20090016278"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:16
S32	2	"8265030"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:19
S33	3	"2008139923"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 18:17

EAST Search History (Interference)

< This search history is empty>

12/13/2012 10:07:31 AM
C:\Users\mtalukder\Documents\EAST\Workspaces\12896993.wsp

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BIB DATA SHEET

CONFIRMATION NO. 1015

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/896,993	10/04/2010	455	2648	4015-6942

APPLICANTS

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Lars Lindbom, Karlstad, SWEDEN;
Stefan Parkvall, Stockholm, SWEDEN;

**** CONTINUING DATA **************************

This appln claims benefit of 61/248,661 10/05/2009

**** FOREIGN APPLICATIONS **************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

10/18/2010

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No		SWEDEN	12	34	6
Verified and Acknowledged	/MD K TALUKDER/ Examiner's Signature	Initials				

ADDRESS

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1400 Crescent Green, Suite 300
Cary, NC 27518
UNITED STATES

TITLE

PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
2608	No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
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	32	✓								
	33	✓								
	34	✓								

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **Astely et al.**	
Serial No.: **12/896,993**	
Filed: **October 4, 2010**	Examiner: Mr. Md K. Talukder
For: **PUCCH Resource Allocation for Carrier Aggregation for LTE-Advanced**	Group Art Unit: 2648
Docket No: **4015-6942**	Confirmation No.: 1015

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

This paper is being filed in response to the Office Action mailed December 19, 2012 having a reply due date of March 19, 2013. Reconsideration is respectfully requested in light of the amendments and/or remarks below. The Office is hereby authorized to charge any fees required for entry of this paper to Deposit Account 18-1167.

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to said user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

2. (Original) The method of claim 1 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier.

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3. (Original) The method of claim 2 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier.

4. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

5. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index.

6. (Original) The method of claim 5 wherein the explicit indication is transmitted as radio resource control signaling.

7. (Original) The method of claim 1 further comprising transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

8. (Original) The method of claim 7 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

9. (Currently amended) A base station comprising:

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a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and

a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to

schedule downlink transmissions to a user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

10. (Original) The base station of claim 9 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier.

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11. (Original) The base station of claim 10 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set of radio resources on the uplink primary component carrier.

12. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources implicitly by sending at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

13. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources explicitly by sending an uplink control channel index.

14. (Original) The base station of claim 13 wherein the controller is further configured to send the explicit indication as radio resource control signaling.

15. (Original) The base station of claim 9 wherein the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

16. (Original) The base station of claim 15 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

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17. (Currently amended) A method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising:

receiving an assignment of radio resources for downlink transmissions from a base station;

transmitting control information associated with the downlink transmissions on a first set of radio resources on an uplink component carrier if an assignment of single downlink component carrier for the downlink transmission is received, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

transmitting control information associated with the downlink transmissions on a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

18. (Original) The method of claim 17 further comprising transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission.

19. (Original) The method of claim 17 further comprising receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink primary component carrier.

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20. (Original) The method of claim 19 wherein receiving control information comprises receiving one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources.

21. (Original) The method of claim 19 wherein receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources.

22. (Original) The method of claim 21 wherein the explicit indication is received as radio resource control signaling.

23. (Original) The method of claim 17 further comprising receiving, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

24. (Original) The method of claim 23 further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

25. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

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a controller to select radio resources for transmission of control information associated with the downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink component carrier if an assignment of a single downlink component carrier for the downlink transmission is received, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

26. (Original) The user terminal of claim 25 configured to transmit user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission.

27. (Original) The user terminal of claim 25 wherein the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier.

28. (Original) The user terminal of claim 27 wherein the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources.

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29. (Original) The user terminal of claim 27 wherein the controller is further configured to receive an uplink control channel index explicitly identifying the second set of radio resources on the uplink primary component carrier.

30. (Original) The user terminal of claim 29 wherein the controller is further configured to receive the explicit indication as radio resource control signaling.

31. (Original) The user terminal of claim 25 wherein the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

32. (Original) The user terminal of claim 31 wherein the controller is configured to select the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

33. (Currently amended) A method implemented by a user terminal in a mobile communication network, the method comprising:

receiving an assignment of radio resources for a downlink transmissions from a base station;

transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink component carrier if an assignment of a first

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downlink component carrier for the downlink transmission is received, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

34. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with downlink transmission, the controller configured to:

select a first set of radio resources on an uplink component carrier if an assignment of a first downlink component carrier for the downlink transmission is received, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

select a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received, wherein the second set of radio resources is

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reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

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REMARKS

In response to the Official Office Action dated December 19, 2012, claims 1, 9, 17, 25, 33, and 34 have been amended. Applicant respectfully submits that the claims are allowable over the cited prior art. Accordingly, reconsideration of this application in light of the following remarks is respectfully requested.

The claimed invention relates to transmission of scheduling information in a communication system using carrier aggregation. The downlink channel comprises multiple downlink component carriers. A user terminal may be scheduled on any one of the downlink component carriers, or on multiple component carriers. In exemplary embodiments of the invention, the transmission of uplink control information associated with downlink transmissions on multiple aggregated downlink component carriers is transmitted on a single, uplink component carrier. The uplink component carrier designated to carry uplink control information is called the uplink primary component carrier (PCC). A first set of resources on the uplink PCC are reserved for single-carrier user terminals scheduled to receive on a first downlink component carrier, e.g. the uplink component carrier associated with the uplink PCC. A second set of resources on the same uplink PCC are semi-statically reserved for single-carrier user terminals scheduled to receive on a second downlink component carrier, or multi-carrier user terminals scheduled to receive downlink transmissions on multiple downlink component carriers. The second set of resources can be dynamically shared by the multi-carrier user terminals to reduce the amount of radio resources needed to support the multi-carrier user terminals.

Claims 1 and 9 are directed to a base station in a multi-carrier communication system using carrier aggregation. Claims 1 and 9 recite that, if a user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, the base station receives control information associated with the downlink transmissions to the user terminal on a first set of radio resources on a uplink primary component carrier associated with said first downlink

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component carrier. Claims 1 and 9 further recite that if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, the base station receives control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier. The claims have been amended to clarify that the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier, and that the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

Claims 1 and 9 have been rejected as being anticipated by Bala (US 2010/0098012). Bala discloses techniques for transmitting uplink control information in a multi-carrier communication system that uses carrier aggregation. Bala describes techniques for allocating resources on the PUCCH in order to control the peak to average power ratio (PAPR) on the uplink control channel. However, Bala does not disclose the claimed first and second sets of radio resources. Rather, Bala discloses that the multi-carrier-carrier user terminals may be assigned more RBs (radio resources) than single-carrier user terminals. Bala does not state, however, that different sets of radio resources are reserved for multi-carrier and single-carrier user terminals. Because Bala does not disclose the claimed first and second sets of resources, Bala does not anticipate claims 1and 9.

Claims 17, 25, 33, and 34 are directed to a base station in a multi-carrier communication system. Claims 17, 25, 33, and 34 all recite first and second sets of radio resources. The first set of radio resources in claims 17, 25, 33, and 34 is reserved for user terminals scheduled to receive downlink transmissions on a first single downlink component carrier. The second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on a second single downlink component carrier (claims 17 and 25), or on multiple downlink

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component carriers (claims 33 and 34). Claims 17, 25, 33, and 34 further recite that, if a user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, the user terminal selects the first set of radio resources for transmission of control information associated with the downlink transmissions to the user terminal. Claims 17 and 25 further recite that if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers, the user terminal selects the second set of radio resources for transmission of control information associated with the downlink transmissions to the user terminal. Claims 33 and 34 further recite that if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier, the user terminal selects the second set of radio resources for transmission of control information associated with the downlink transmissions to the user terminal.

Claims 17, 25, 33, and 34 have been rejected as being anticipated by Bala (US 2010/0098012). As noted above, Bala does not disclose the claimed first and second sets of reserved radio resources as recited in claims 17, 25, 33 and 34. Therefore, claims 17, 25, 33 and 34 are allowable for the same reasons as claims 1 and 9.

The dependent claims all depend directly or indirectly from allowable independent claims and are therefore believed to be allowable for the same reasons.

Claims 7, 15, 23, and 31 further recite an acknowledgement resource indicator to dynamically assign the second set of radio resources on the primary uplink component carrier when the user terminal is scheduled to receive a downlink transmission on the second downlink component carrier or multiple downlink component carriers. Bala does not disclose any element analogous to the claimed acknowledgement resource indicator. Accordingly, these claims are believed to be allowable for this additional reason.

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For the forgoing reasons, it is submitted that the application is in condition for allowance and notice to such effect is respectfully requested.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

Dated: March 19, 2013

David E. Bennett
Registration No.: 32,194
Telephone: (919) 854-1844

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Electronic Acknowledgement Receipt

EFS ID:	15294254
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	David E. Bennett/Donna Donovan
Filer Authorized By:	David E. Bennett
Attorney Docket Number:	4015-6942
Receipt Date:	19-MAR-2013
Filing Date:	04-OCT-2010
Time Stamp:	10:33:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response_to_OA.pdf	60476 4ccc5ebfe◀61a842b3e501◀894a7c155ea9◀ca4	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	15

Warnings:	
Information:	
Total Files Size (in bytes):	60476

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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/896,993	10/04/2010	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	330
☒ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	540
☒ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	34 minus 20 =	* 14	x $ =		OR	x $52 =	728
INDEPENDENT CLAIMS (37 CFR 1.16(h))	6 minus 3 =	* 3	x $ =			x $220 =	660
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2478

APPLICATION AS AMENDED – PART II

AMENDMENT	03/19/2013	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 34	Minus	** 34	= 0	x $ =		OR	x $80=	0
	Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	x $ =		OR	x $420=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =		OR	x $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =		OR	x $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DIANE JOHNSON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942	1015

24112 7590 07/03/2013
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER	
TALUKDER, MD K	

ART UNIT	PAPER NUMBER
2648	

MAIL DATE	DELIVERY MODE
07/03/2013	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 12/896,993	Applicant(s) ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2013*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-34* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-34* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some * c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

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1. It would be of great assistance to the office if all incoming papers pertaining to a filed application carried the following items:

i. Application number (checked for accuracy, including series code and serial no.).
ii. Group art unit number (copied from most recent Office communication).
iii. Filing date.
iv. Name of the examiner who prepared the most recent Office action.
v. Title of invention.
vi. Confirmation number (See MPEP § 503).

Response to Arguments

2. Applicant's arguments with respect to claims **1** have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejection- 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained through the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nory (Pub No. 2010/0232373) and further in view of Pan (Pub No. 2010/0271970).

Regarding claim 1, Nory teaches a method implemented by a base station of receiving control information from a user terminal (**Fig. 3 & 4**), the method comprising: scheduling downlink transmissions to said user terminal on one or more downlink component carriers (Para. 49: **"…If a sub frame n+1 with single component carrier**

allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…"); if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receiving control information on a first set of radio resources, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier**) **(also Para. 13-17);** if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information on a second set of radio resources, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers (Para. 36: "**… the remaining ten bits can signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment**

in groups of 4 resource blocks each. If the UE is configured to receive PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with said first downlink component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with downlink component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL component carrier that an UL grant is intended, the UL component carrier may be associated with a DL component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…**") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…**") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to

which this invention pertains at the time it was made to use uplink downlink control information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 2, 10, Nory teaches that the control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier (abstract: "**…The transceiver is also configured to receive a second control message on the anchor carrier, the second control message associated with a set of component carriers, the set of component carriers are distinct from the anchor carrier. The controller determines a resource assignment for at least one component carrier in the set of component carriers using both the first and the second control messages**").

Regarding claim 3, 11, Nory teaches transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Regarding claim 4, 12, Nory teaches at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier (**Fig. 3**).

Regarding claim 5, 13, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Regarding claim 6, 14, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access. Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").**

Regarding claim 7, 15, Nory teaches transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the**

transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers") and (Para. **26, 36 & 40**).

Regarding claim 8, 16, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers**").

Regarding claim 9, Nory teaches a base station comprising (Fig. **1 & 3**): a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to schedule downlink transmissions to a user terminal on one or more downlink component carriers (Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component**

carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…"); if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier, receiving control information on a first set of radio resources, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier) (also Para. 13-17);** if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information on a second set of radio resources, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers (Para. 36: "**… the remaining ten bits can signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each. If the UE is configured to receive**

PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with said first downlink component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with downlink component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL component carrier that an UL grant is intended, the UL component carrier may be associated with a DL component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…**") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…**") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use uplink downlink control

information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 17, Claim 17 corresponds to claim 9 and is analyzed accordingly.

Regarding claim 18, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Regarding claim 19, Claim 19 corresponds to claim 2 and is analyzed accordingly.

Regarding claim 20, Claim 20 corresponds to claim 3 and is analyzed accordingly.

Regarding claim 21, Claim 21 corresponds to claim 5 and is analyzed accordingly.

Regarding claim 22, Claim 22 corresponds to claim 6 and is analyzed accordingly.

Regarding claim 23, Claim 23 corresponds to claim 7 and is analyzed

accordingly.

Regarding claim 24, Claim 24 corresponds to claim 8 and is analyzed accordingly.

Regarding claim 25, Nory teaches user terminal for mobile communications, the user terminal comprising: a receiver to receive downlink transmissions from a base station (**Fig. 1**); a transmitter to transmit control information associated with the downlink transmission to a base station (**Fig. 1**: **remote unit receive and transmit signals to the base unit**); and a controller to select radio resources for transmission of control information associated with the downlink transmissions (**Fig. 3**), the controller configured to: select a first set of radio resources if an assignment of a single downlink component carrier for the downlink transmission is received, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier (Para. 36: "**The 'Resource Block assignment' bits signal the resource blocks assigned to the UE for receiving PDSCH transmissions within each component carrier. UE can choose an appropriate mapping function to map the Resource Block assignment bits to a set of resource block indices assigned for PDSCH transmission. The mapping function can be a "type 0" mapping function or a "type 1" mapping function or a "type 2" mapping function as described in 3GPP TS 36.213 section 7.1.6. For example, if the UE is configured to receive PDSCH on a set of two component carriers, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier**"); and select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component

carriers for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers Para. 36: "**the remaining ten bits can signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each. If the UE is configured to receive PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each. In a different example, the RB assignment bits in PDCCH-2 can be used to signal an offset value to the RB assignment of the anchor carrier (signaled in PDCCH-1) for determining the RB assignment for the component carrier**").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL component carrier that an UL grant is intended, the UL component carrier may be associated with a DL**

component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…**") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use uplink downlink control information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 26, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Regarding claim 27, Nory teaches the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Regarding claim 28, Nory teaches the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources (**Fig. 3**).

Regarding claim 29, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Regarding claim 30, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base**

station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access. Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").

Regarding claim 31, Nory teaches the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers**") and (Para. **26, 36 & 40**).

Regarding claim 32, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio**

resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers").

Regarding claim 33, Claim 33 corresponds to claim 17 & 9 and is analyzed accordingly.

Regarding claim 34, Claim 34 corresponds to claim 25 and is analyzed accordingly.

CONCLUSION

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication from the examiner should be directed to Patent Examiner Md Talukder whose telephone number is (571) 270-3222. The examiner can normally be reached on Mon-Th 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Ghebretinsae, Temesghen can be reached on (571) 272-3017.

Information regarding the status of an application may be obtaining from the patent application information retrieval (PAIR) system. Status information for the published applications may be obtained from either private PAIR or public PAIR. Status information for unpublished application is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the private PAIR system, contract the Electronics Business Center (EBC) at 866-217-9197. If you would like assistance from USPTO customer service representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA).

/ Md. Talukder /

/ Art Unit # 2648 /

/TEMESGHEN GHEBRETINSAE/
Supervisory Patent Examiner, Art Unit 2648
7/1/13R

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2010/0003997 A1	01-2010	KOYANAGI, Kenichiro	455/450
*	B	US-2010/0098012 A1	04-2010	Bala et al.	370/329
*	C	US-2010/0208679 A1	08-2010	Papasakellariou et al.	370/329
*	D	US-2010/0232373 A1	09-2010	Nory et al.	370/329
*	E	US-2010/0271970 A1	10-2010	Pan et al.	370/252
*	F	US-2010/0296389 A1	11-2010	Khandekar et al.	370/216
*	G	US-2010/0285809 A1	11-2010	Lindstrom et al.	455/450
*	H	US-2010/0322173 A1	12-2010	Marinier et al.	370/329
*	I	US-2011/0007695 A1	01-2011	Choi et al.	370/329
*	J	US-2011/0007699 A1	01-2011	Moon et al.	370/329
*	K	US-2011/0081932 A1	04-2011	Astely et al.	455/509
*	L	US-2011/0081913 A1	04-2011	Lee et al.	455/450
*	M	US-2011/0310856 A1	12-2011	Hariharan et al.	370/336

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2012/0020317 A1	01-2012	Ishii et al.	370/329
*	B	US-2012/0051306 A1	03-2012	Chung et al.	370/329
*	C	US-2012/0082125 A1	04-2012	Huang, Yada	370/329
*	D	US-2012/0140708 A1	06-2012	Choudhury et al.	370/328
*	E	US-8,265,030 B2	09-2012	Miki et al.	370/330
*	F	US-2012/0314675 A1	12-2012	Vujcic, Dragan	370/329
*	G	US-2013/0003700 A1	01-2013	Zhang et al.	370/331
*	H	US-2013/0010721 A1	01-2013	Aiba et al.	370/329
*	I	US-2013/0034073 A1	02-2013	Aiba et al.	370/329
*	J	US-8,447,343 B2	05-2013	Gerstenberger et al.	455/522
*	K	US-2013/0136084 A1	05-2013	ZHANG et al.	370/329
*	L	US-8,472,368 B2	06-2013	Baldemair et al.	370/318
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

CPC- SEARCHED

Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
455	509,522,456.6,137,103,575	12/11/2012	Talukder
370	329,252,331	12/11/2012	Talukder
455	Text	6/17/2013	
370	329,341,348,395.4	6/26/2013	

SEARCH NOTES

Search Notes	Date	Examiner
East Search	12/10/2012	talukder
East Search	12/11/2012	talukder
East Search	6/17/2013	talukder
East Search	6/18/2013	talukder
East Search	6/26/2013	talukder
East Search	6/27/2013	

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

IPR2022-00648
Apple EX1005 Page 157

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"12896993"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 17:09
S2	367	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:04
S3	176	S2 and (radio near3 resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S4	28	S2 and (radio near3 resource) and (component with carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S5	173	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S6	137	S5 and (scheduling)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S7	36	("20120263121" | "20110310856" | "20120127950" | "20110310819 " | "20120275395" | "20120287828" | "20120039291" | "20100271970" | "20120307781" | "20110286436" | "20120224535" | "20120140708" | "20110310820" | "20120163288" | "20110299486" | "20100098012" | "20120082125 " | "20120294273" | "20110268048" | "20120113910").pn.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:15
S8	127	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (carrier adj aggregation)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 10:16
S9	2	"20110292887"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:17

S11	25	((first 1st) adj6 component adj3 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:22
S12	1718	((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S13	66	(carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S14	10842	455/509,522,456.6,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S15	28232	370/329,252,331.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S16	102	(S14 S15) and (downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:42
S17	1	"13140333"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S18	2	"20110310856"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S19	38	((first 1st) adj6 component adj3 carrier) same ((radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S20	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S21	27	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj4 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S22	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32

S23	24	(carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:48
S24	8	("7551898" | "7649960" | "7656843" | "7773699").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:14
S25	2	"20110292900"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:36
S26	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:37
S27	3	"8050202"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:38
S28	1	"20120307689"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:45
S29	2	"8160017"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S30	2	"20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S31	2	"20090016278"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:16
S32	2	"8265030"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:19
S33	3	"2008139923"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 18:17
S34	14	("20100098012" | "20100232373" | "20110310856" | "20120020317" | "20120082125" | "20120140708" | "8265030").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:19

S35	7	"455"/$.ccls. and (carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:22
S36	9	"455"/$.ccls. and (((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 21:37
S37	57	((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:21
S38	4	("20070053294" | "20100290405").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S39	16	("7596114" | "20050013279" | "20030219028" | "20070217406" | "20020105970" | "20060050664" | "20090303938" | "20070064669").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S40	290	(first 1st) with (component near2 carrier) with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:07
S41	114	(first 1st) with (component near2 carrier) with down$1link and receiv$3 near3 control near3 information	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:09
S42	47	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:29
S43	26	S42 and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:31
S44	5	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) same (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:46
S45	26	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:47
S46	31	(second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2013/06/17 12:49

			IBM_TDB			
S47	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:51
S48	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:52
S49	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:53
S50	1	@ad<"20091005" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:55
S51	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:56
S52	20	(second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 13:31
S53	16	(set near3 radio near3 resource) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:14
S54	27	(set near3 ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:19
S55	755	(((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:25
S56	70	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:26
S57	327	(((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 downlink reverse)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27
S58	29	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2013/06/17 14:27

			IBM_TDB			
S59	24	((second 2nd other) with ((radio near3 resource) (resource adj block))) same (component adj carrier) same (down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:31
S60	10	("20090097447" | "20110081856" | "20090116427" | "20100232373" | "8331307").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:49
S61	2562	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:16
S62	739	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S63	259	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S64	39	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S65	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S66	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20
S67	47	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20
S68	356	"455"/$.ccls. and ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:10
S70	19	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:17
S71	0	("2013/0107855").URPN.	USPAT	OR	ON	2013/06/18 09:15

S72	0	("2013/0107855").URPN.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:16
S73	408	set near3 (radio frequency) near2 (resource band) same downlink and component	US-PGPUB; USPAT	OR	ON	2013/06/18 09:18
S74	17	set near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:19
S75	19	(set group Cluster) near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:21
S76	12	("8457060" | "20110310819" | "20100271970" | "20130034073" | "20100098012" | "20110310856" | "20110317653" | "20130083742" | "20130083741" | "20120114021" | "20120275395" | "20110317645" | "20110310856").pn.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:31
S77	200	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:37
S78	2911	(UL up$link) with (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S79	110	S77 and S78	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S80	3	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (set group) near6 (radio resource) with (2nd second other another) near2 component	US-PGPUB; USPAT	OR	ON	2013/06/18 10:47
S81	28	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:17
S82	5	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (second 2nd) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:20
S83	4	(1st first first primary initia) near3 (set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:50
S84	3	(set group) near6 (radio resource) with (2nd second other another) near6 (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:52
S85	42	(set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:58
S86	30	(set group) near3 ((radio resource)(resource near2 block)) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 14:07
S87	2	(second 2nd) near3 (down$1link DL) with ((component near3 carrier) CC) same (set group) with ((radio near2	US-PGPUB; USPAT	OR	ON	2013/06/18 14:14

		resource) (resource near2 block))				
S88	21	reserv$3 with component near3 carrier and (second near2 (radio frequency band))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/25 15:31
S89	36	"739528"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:34
S90	30	"5754138"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:35
S91	2046	(carrier near3 aggregation) and up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:24
S92	1052	(carrier near3 aggregation) and (component near3 carrier) same up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:26
S93	110	(carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:27
S94	16	("370"/$.ccls "455"/$.ccls.) and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:20
S95	17	("370"/$.ccls "455"/$.ccls.) and (aggregation) and (CC (component near3 carrier)) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:22
S96	67	370/329,341,348,395.4.ccls. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:26
S97	345368	schedule (DL (down adj link) down$1link) and (carrier near3 aggregation) and ((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:45
S98	9	schedule near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:46
S99	35	(schedule allocat$4) near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2013/06/26 16:48

			IBM_TDB			
S100	0	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CCcomponent adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S101	216	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S102	43	(1st first) near3 (radio band resource frequency) with (reserv$3 schedul$3 allocat$3) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:15
S103	22	("20100142455" | "20120009923" | "20100254329" | "20100091678" | "20110194501" | "20130010619" | "20080310359" | "20060274712" | "20100227569" | "20120208583" | "20110267978").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 09:57
S104	10	("20100254329" | "20100195624" | "20100023282" | "20090274100" | "20080316957").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 10:15

EAST Search History (Interference)

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6/27/2013 4:48:25 PM
C:\Users\mtalukder\Documents\EAST\Workspaces\12896993.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012	06/27/2013							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
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	27	✓	✓							
	28	✓	✓							
	29	✓	✓							
	30	✓	✓							
	31	✓	✓							
	32	✓	✓							
	33	✓	✓							
	34	✓	✓							

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	12896993	Filing Date	2010-10-04	Docket Number (if applicable)	4015-6942	Art Unit	2648
First Named Inventor	David Astely			Examiner Name	Mr. Md K. Talukder		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 181167

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Zheng Li, Reg. No. 70555/	Date (YYYY-MM-DD)	2013-10-25
Name	Zheng Li	Registration Number	70555

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the informa solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Offi is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information A (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a reque involving an individual, to whom the record pertains, when the individual has requested assistance from the Membe with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need fo the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for t purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcem agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **Astely et al.**

Serial No.: **12/896,993**

Filed: **October 4, 2010**

For: **PUCCH Resource Allocation for Carrier Aggregation for LTE-Advanced**

Docket No: **4015-6942**

Examiner: Mr. Md K. Talukder

Group Art Unit: 2648

Confirmation No.: 1015

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

This amendment is being filed in concurrently with a Request for Continued Examination (RCE) response to the Final Office Action mailed July 3, 2013. Reconsideration is respectfully requested in light of the amendments and remarks below. Applicant is electronically submitting the requisite fees for the RCE and a two-month extension of time. No other fees should be required or due for entry of this amendment. However, if any other fees are required for entry of this amendment, the Office is authorized to charge those fees to Deposit Account 18-1167.

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to said user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier associated with an uplink primary component carrier, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on ~~a~~ the uplink primary component carrier associated with said first downlink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

2. (Original) The method of claim 1 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier.

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3. (Original) The method of claim 2 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier.

4. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

5. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index.

6. (Original) The method of claim 5 wherein the explicit indication is transmitted as radio resource control signaling.

7. (Original) The method of claim 1 further comprising transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

8. (Original) The method of claim 7 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

9. (Currently amended) A base station comprising:

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a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and

a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to

schedule downlink transmissions to a user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier associated with an uplink primary component carrier, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on ~~a~~ the uplink primary component carrier associated with said first downlink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink primary component carrier, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

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10. (Original) The base station of claim 9 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier.

11. (Original) The base station of claim 10 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set of radio resources on the uplink primary component carrier.

12. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources implicitly by sending at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

13. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources explicitly by sending an uplink control channel index.

14. (Original) The base station of claim 13 wherein the controller is further configured to send the explicit indication as radio resource control signaling.

15. (Original) The base station of claim 9 wherein the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

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16. (Original) The base station of claim 15 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

17. (Currently amended) A method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising:

receiving an assignment of radio resources for downlink transmissions from a base station;

transmitting control information associated with the downlink transmissions on a first set of radio resources on an uplink primary component carrier if an assignment of a single downlink component carrier associated with the uplink primary component carrier is received for the downlink transmission ~~is received~~, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

transmitting control information associated with the downlink transmissions on a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

18. (Original) The method of claim 17 further comprising transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission.

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19. (Original) The method of claim 17 further comprising receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink primary component carrier.

20. (Original) The method of claim 19 wherein receiving control information comprises receiving one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources.

21. (Original) The method of claim 19 wherein receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources.

22. (Original) The method of claim 21 wherein the explicit indication is received as radio resource control signaling.

23. (Original) The method of claim 17 further comprising receiving, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

24. (Original) The method of claim 23 further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

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25. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with the downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink primary component carrier if an assignment of a single downlink component carrier associated with the uplink primary component carrier is received for the downlink transmission ~~is received~~, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

26. (Original) The user terminal of claim 25 configured to transmit user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission.

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27. (Original) The user terminal of claim 25 wherein the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier.

28. (Original) The user terminal of claim 27 wherein the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources.

29. (Original) The user terminal of claim 27 wherein the controller is further configured to receive an uplink control channel index explicitly identifying the second set of radio resources on the uplink primary component carrier.

30. (Original) The user terminal of claim 29 wherein the controller is further configured to receive the explicit indication as radio resource control signaling.

31. (Original) The user terminal of claim 25 wherein the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers.

32. (Original) The user terminal of claim 31 wherein the controller is configured to select the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

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33. (Currently amended) A method implemented by a user terminal in a mobile communication network, the method comprising:

receiving an assignment of radio resources for a downlink transmissions from a base station;

transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink primary component carrier if an assignment of a first downlink component carrier associated with the uplink primary component carrier is received for the downlink transmission ~~is received~~, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

34. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with downlink transmission, the controller configured to:

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select a first set of radio resources on an uplink primary component carrier if an assignment of a first downlink component carrier associated with the uplink primary component carrier is received for the downlink transmission ~~is received~~, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier; and

select a second set of radio resources on the uplink component carrier if an assignment of a second downlink component carrier for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers.

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REMARKS

In response to the Official Office Action dated July 3, 2013, Applicant has amended claims 1, 9, 17, 25, 33 and 34. Applicant respectfully submits that the claims 1-34 are allowable over the cited prior art. Accordingly, reconsideration of this application in light of the following remarks is respectfully requested.

The invention discloses an uplink signaling mechanism for efficient transmission of control information in a communication system using carrier aggregation. The downlink channel comprises multiple downlink component carriers. A user terminal may be scheduled to receive downlink transmissions on any one of the downlink component carriers, or on multiple downlink component carriers. The uplink signaling mechanism allows the transmission, on a single uplink component carrier, of control information associated with downlink transmissions on one or multiple aggregated downlink component carriers. The uplink component carrier designated to carry uplink control information is called the uplink primary component carrier (UL-PCC). A user terminal transmits control information on a first set of radio resources on the UL-PCC if an assignment of a first single downlink component carrier for the downlink transmissions is received by the user terminal. And a user terminal transmits control information on a second set of radio resources on the UL-PCC if an assignment of a second single downlink component carrier or multiple downlink component carriers for the downlink transmissions is received by the user terminal.

Independent claims 1, 9, 27, 25, 33 and 34 are rejected under 35 USC 103(a) as being obvious over Nory (US 2010/0232373) in view of Pan (US 2010/0271970). The cited references do not disclose transmitting/receiving uplink control information on a first set of radio resources for downlink transmission on a first single downlink component carrier, and transmitting/receiving uplink control information on a second set of radio resources for downlink transmissions on a second single downlink component carrier or on multiple downlink

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component carriers. Accordingly, for reasons explained more fully below, Applicant believes that the claimed invention is allowable of the cited references.

Nory discloses that the base station transmits a first control message on an anchor carrier in downlink for the UE to determine its PDSCH resource assignment for a first set of component carriers. The base station also transmits a second control message on the same anchor carrier for the UE to determine its PDSCH resource assignment for a second set of component carriers [see Fig. 3 and Fig. 4]. Nory also discloses that the UE can use the "Resource Block (RB) assignment" bits to determine the resource block indices assigned for PDSCH transmissions. For example, if the UE is configured to receive PDSCH on a set of two component carriers, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier [see 0036]. As acknowledged by the Examiner, Nory does not disclose transmitting uplink control information associated with the downlink transmissions to the user terminal on an uplink primary component carrier associated with a first downlink component carrier.

Pan discloses transmitting control information associated with the downlink transmissions to the user terminal on an uplink component carrier associated with said first downlink component carrier [see 0041]. The Examiner contends that it would be obvious to modify Nory to transmit uplink control information on an uplink component carrier as taught by Pan.

It is respectfully submitted that the combination of the prior art references does not teach the claimed invention.

First, Nory discloses a downlink signaling mechanism while the claimed invention is related to a uplink signaling mechanism. In Nory, the "Resource Block (RB) assignment" bits are used to signal additional information to the UE. That is, the signal mechanism in Nory is

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performed on the downlink [see 0035]. Rather, in the claimed invention, the user terminal transmits uplink control information on the uplink primary component carrier (UL-PCC). Nory does not disclose any signal mechanism performed by the user terminal on a first set of radio resources and on a second set of radio resources on the uplink. Pan does not solve the deficiency.

Second, in Nory, the base station transmits control messages on both the two sets of resources on the anchor carrier [see Fig. 3] while in the claimed invention, the user terminal transmits control information on either the first set of resources or the second set of resources on the uplink. In Nory, if the UE is configured to receive PDSCH on a set of two component carriers, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier [see 0036]. That is, both the two sets of resources (twenty bits) in the RB assignment field are transmitted to the UE. However, in the claimed invention, a user terminal transmits control information on a first set of radio resources if an assignment of a first single downlink component carrier for the downlink transmissions is received. And a user terminal transmits control information on a second set of radio resources if an assignment of a second single downlink component carrier or multiple downlink component carriers for the downlink transmissions is received. Thus, the user terminal transmits control information on either the first set of resources or the second set of resources depending on what type of downlink assignment is received. That is, the user terminal does not transmit on both the first and the second sets of resources simultaneously. Nory does not disclose that the user terminal transmits control information on either the first set of resources or the second set of resources on the uplink. Pan does not solve the deficiency.

The dependent claims all depend directly or indirectly from allowable independent claims and are therefore believed to be allowable for the same reasons.

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For the forgoing reasons, it is submitted that the application is in condition for allowance and notice to such effect is respectfully requested.

Respectfully submitted,

COATS & BENNETT, P.L.L.C.

Zheng Li

Dated: October 25, 2013

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Registration No.: 70,555
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Electronic Patent Application Fee Transmittal

Application Number:	12896993
Filing Date:	04-Oct-2010
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Filer:	Zheng Li/Donna Donovan
Attorney Docket Number:	4015-6942

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
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($)
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
		Total in USD ($)		**1200**

Electronic Acknowledgement Receipt

EFS ID:	17227887
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	Zheng Li/Donna Donovan
Filer Authorized By:	Zheng Li
Attorney Docket Number:	4015-6942
Receipt Date:	25-OCT-2013
Filing Date:	04-OCT-2010
Time Stamp:	12:24:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$1200
RAM confirmation Number	11103
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

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1	Request for Continued Examination (RCE)	RCE.pdf	79003 53f8f37f5935966c4eb52e0da10a85838998 2f7f	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2		Preliminary_Amendment.pdf	60757 9788875e16964d44f08619815bb48f05f1d 2757b	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	15

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29894 c7745a28bf679680940939c3394c2e45997 d3f94	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	169654		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/896,993	Filing Date 10/04/2010	☒ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	10/25/2013	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 34	Minus	** 34	= 0	x $80 =	0
	Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	x $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/NICHELE PETERSON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TALUKDER, MD K	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 12/896,993	Applicant(s) ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/25/2013*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-34* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-34* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

2. It would be of great assistance to the office if all incoming papers pertaining to a filed application carried the following items:

i. Application number (checked for accuracy, including series code and serial no.).
ii. Group art unit number (copied from most recent Office communication).
iii. Filing date.
iv. Name of the examiner who prepared the most recent Office action.
v. Title of invention.
vi. Confirmation number (See MPEP § 503).

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/21/2014 has been entered.

Claim Rejection- 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained through the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nory (Pub No. 2010/0232373) and further in view of Pan (Pub No. 2010/0271970).

Regarding claim 1, Nory teaches a method implemented by a base station of receiving control information from a user terminal (**Fig. 3 & 4**), the method comprising: scheduling downlink transmissions to said user terminal on one or more downlink component carriers (Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…");** if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier associated with an uplink component carrier, receiving control information on a first set of radio resources, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also**

scheduled to the UE in the same sub-frame as the PDCCH-A…") (also Para. 13-17); if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information on a second set of radio resources, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers (Para. 36: "**… the remaining ten bits can signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each. If the UE is configured to receive PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each**").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with said first downlink component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with downlink component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL**

component carrier that an UL grant is intended, the UL component carrier may be associated with a DL component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…**") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use uplink downlink control information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 2, 10, Nory teaches that the control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier (abstract: "**…The transceiver is also configured to receive a second control message on the anchor carrier, the second control message associated with a set of component carriers, the set of component carriers are distinct from the anchor carrier. The controller determines a resource assignment for at least one component carrier in the set of component carriers using both the first and the second control messages**").

Regarding claim 3, 11, Nory teaches transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Regarding claim 4, 12, Nory teaches at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier (**Fig. 3**).

Regarding claim 5, 13, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Regarding claim 6, 14, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access.**

Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").

Regarding claim 7, 15, Nory teaches transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers**") and (Para. **26, 36 & 40**).

Regarding claim 8, 16, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of**

component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers").

Regarding claim 9, Nory teaches a base station comprising (Fig. **1 & 3**): a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to schedule downlink transmissions to a user terminal on one or more downlink component carriers (Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…");** if the user terminal is scheduled to receive downlink transmissions on a first single downlink component carrier associated with an uplink primary component carrier, receive control information on a first set of radio resources, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier …if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component**

carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A…") (also Para. 13-17); if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier or multiple downlink component carriers, receiving control information on a second set of radio resources, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers (Para. 36: "**… the remaining ten bits can signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each. If the UE is configured to receive PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each**").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with said first downlink component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with downlink component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL component carrier that an UL grant is intended, the UL component carrier may be associated with a DL component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…**") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…**") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use uplink downlink control information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 17, Nory teaches a user terminal of transmitting control information in a mobile communication network, the method comprising: receiving an assignment of radio resources for downlink transmissions from a base station (**Fig. 3 & 4 and Abstract: "A wireless communication terminal including a controller coupled to a wireless transceiver wherein**

the transceiver is configured to receive a first control message on an anchor carrier, the first control message including a resource assignment for the anchor carrier"); transmitting the downlink transmissions on a first set of radio resources on an uplink primary component carrier if an assignment of single downlink component carrier associated with the uplink primary component carrier is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminal scheduled to receive downlink transmission on the first downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A…") (also Para. 13-17)**; and transmitting the downlink transmissions on a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmission on the second downlink component carrier or multiple component carriers (Para. 36: "**… the remaining ten bits can**

signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each. If the UE is configured to receive PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with said first downlink component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier associated with downlink component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL component carrier that an UL grant is intended, the UL component carrier may be associated with a DL component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…**") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI**

grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use uplink downlink control information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 18, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Regarding claim 19, Claim 19 corresponds to claim 2 and is analyzed accordingly.

Regarding claim 20, Claim 20 corresponds to claim 3 and is analyzed accordingly.

Regarding claim 21, Claim 21 corresponds to claim 5 and is analyzed accordingly.

Regarding claim 22, Claim 22 corresponds to claim 6 and is analyzed accordingly.

Regarding claim 23, Claim 23 corresponds to claim 7 and is analyzed accordingly.

Regarding claim 24, Claim 24 corresponds to claim 8 and is analyzed accordingly.

Regarding claim 25, Nory teaches user terminal for mobile communications, the user terminal comprising: a receiver to receive downlink transmissions from a base station (**Fig. 1**); a transmitter to transmit control information associated with the downlink transmission to a base station (**Fig. 1**: **remote unit receive and transmit signals to the base unit**); and a controller to select radio resources for transmission of control information associated with the downlink transmissions (**Fig. 3**), the controller configured to: select a first set of radio resources on an uplink primary component carrier if an assignment of a single downlink component carrier for the downlink transmission is received, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier (Para. 36: "**The 'Resource Block assignment' bits signal the resource blocks assigned to the UE for receiving PDSCH transmissions within each component carrier. UE can choose an appropriate mapping function to map the Resource Block assignment bits to a set of resource block indices assigned for PDSCH transmission. The mapping function can be a "type 0" mapping function or a "type 1" mapping function or a "type 2" mapping function as described in 3GPP TS 36.213 section 7.1.6. For example, if the UE is configured to receive PDSCH on a set of two component carriers, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component**

carrier") & (Para. **13-17 & 26**); and select a second set of radio resources on the uplink component carrier if an assignment of multiple downlink component carriers for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second downlink component carrier and/or multiple component carriers (Para. 36: "**the remaining ten bits can signal the resource block allocation for the second component carrier. Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each. If the UE is configured to receive PDSCH on a set of two component carriers, UE can interpret that the Resource Block assignment bits are signaling resource blocks in groups of 12 resource blocks each. In a different example, the RB assignment bits in PDCCH-2 can be used to signal an offset value to the RB assignment of the anchor carrier (signaled in PDCCH-1) for determining the RB assignment for the component carrier**").

Nory fails to teach that the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier.

In a same field of endeavor, Pan teaches the control information associated with the downlink transmissions to the user terminal on uplink primary component carrier (Para. 41: "…**the WTRU may use the same UL/DL carrier association rule for both UCI and DCI transmission. In order to indicate which UL component carrier that an UL grant is**

intended, the UL component carrier may be associated with a DL component carrier in such way that if an UL grant is transmitted in a DL component carrier x, then the UL grant is intended for an UL component carrier y where a mapping function f( ) that maps a DL component carrier x to UL component carrier y by y=f(x)…") and (Para. 36: "**For asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) with combined joint coding, multiplexing or bundling techniques, periodic or aperiodic PUSCH, or combinations of PUCCH and PUSCH to transmit the UCI…**") (Also Para. 24, 32, 47, 54,101, 102).

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use uplink downlink control information transmission process of Pan's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 26, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Regarding claim 27, Nory teaches the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Regarding claim 28, Nory teaches the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources (**Fig. 3**).

Regarding claim 29, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Regarding claim 30, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access. Before**

assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").

Regarding claim 31, Nory teaches the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers**") and (Para. **26, 36 & 40**).

Regarding claim 32, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of**

component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers").

Regarding claim 33, Claim 33 corresponds to claim 17 & 9 and is analyzed accordingly.

Regarding claim 34, Claim 34 corresponds to claim 25 and is analyzed accordingly.

Response to Arguments

5. i. Applicant's arguments, with regards to claims have been fully considered but they are not persuasive.

ii. On page 13-14, Applicant arguing that "First, Nory discloses a downlink signaling mechanism while the claimed invention is related to a uplink signaling mechanism. In Nory, the 'Resource Block (RB) assignment' bits are used to signal additional information to the UE. That is, the signal mechanism in Nory is performed on the downlink [see 0035]. Rather, in the claimed invention, the user terminal transmits uplink control information on the uplink primary component carrier (UL-PCC). Nory does not disclose any signal mechanism performed by the user terminal on a first set of radio resources and on a second set of radio resources on the uplink. Pan does not solve the deficiency".

Examiner respectfully disagrees with the applicant arguments. First of all, the claimed invention is related to an uplink signaling mechanism which is not true. Claim 1 state

"**scheduling downlink transmissions to said user terminal on one or more downlink component carriers**" (Line 3). Therefore, claim is related to scheduling downlink transmission.

Next, Nory's invention related to radio resource allocation system for the downlink and uplink communication (Para. 27: "**where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers. The configuration message can be signaled to the UE via RRC signaling. Alternatively, the configuration message can be embedded within an activation PDCCH message (PDCCH-A) and signaled to the UE**" and Para. 32: "**TABLE-US-00001 TABLE 1 Contents of PDCCH-1 message with DCI Format 1 Field identifier Number of bits Resource allocation header 1 Resource Block assignment 25 MCS 5 HARQ process number 3 New Data Indicator 1 RV 2 TPC command for PUCCH 2 CRC (scrambled with Rel-8 C-RNTI) 16 Total 55**").

Secondary reference, Pan also related to resource allocation on downlink and uplink communication system (Para. 102: "**Referring to FIG. 13, there is shown an example flowchart 600 for transmitting UCI from a WTRU to a base station. The WTRU receives configuration information regarding DL component carriers and an UL primary component carrier (605). The WTRU may also receive feedback mode information from the base station (610). Alternatively, the feedback mode information may be part of the configuration information (615). The WTRU uses the configuration information to associate the DL component carriers with a control channel or channel carrying UCI (620). The UCI corresponding to the associated DL component carriers-UL component carriers may then be jointly coded…**") and (Fig. 1: WTRU-110 is the user equipment).

iii. On page 14, applicant also arguing that "Second, in Nory, the base station transmits control messages on both the two sets of resources on the anchor carrier [see Fig. 3] while in the claimed invention, the user terminal transmits control information on either the first set of resources or the second set of resources on the uplink".

Examiner disagrees with the applicant arguments. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. **either the first set of resources or the second set of resources on the uplink**) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

iv. In this case, the references are selected as being reasonably pertinent to the problem based on the judgment of a person having ordinary skill in the art. It is necessary to consider the reality of the circumstances, in other words, common sense in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor. In re Wood, 599 F.2d 1032, 1036, (C.C.P.A. 1979).

v. The Examiner has pointed out particular references contained in the prior art of record within the body of this action for the convenience of the Applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages, paragraph and figures may apply. Applicant, in preparing the response, should consider fully the entire reference as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MD TALUKDER whose telephone number is (571)270-3222. The examiner can normally be reached on Monday to Friday (Alt Friday off) from (9:30 to 4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghebretinsae Temesghen can be reached on 5712723017. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MD TALUKDER/
Examiner, Art Unit 2648

/TEMESGHEN GHEBRETINSAE/

Supervisory Patent Examiner, Art Unit 2648

5/1/14B

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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*	B	US-2010/0098012 A1	04-2010	Bala et al.	370/329
*	C	US-2010/0208679 A1	08-2010	Papasakellariou et al.	370/329
*	D	US-2010/0232373 A1	09-2010	Nory et al.	370/329
*	E	US-2010/0271970 A1	10-2010	Pan et al.	370/252
*	F	US-2010/0296389 A1	11-2010	Khandekar et al.	370/216
*	G	US-2010/0285809 A1	11-2010	Lindstrom et al.	455/450
*	H	US-2010/0322173 A1	12-2010	Marinier et al.	370/329
*	I	US-2011/0007695 A1	01-2011	Choi et al.	370/329
*	J	US-2011/0007699 A1	01-2011	Moon et al.	370/329
*	K	US-2011/0081932 A1	04-2011	Astely et al.	455/509
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	N					
	O					
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	S					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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*	B	US-2012/0020317 A1	01-2012	Ishii et al.	370/329
*	C	US-2012/0051306 A1	03-2012	Chung et al.	370/329
*	D	US-2012/0082125 A1	04-2012	Huang, Yada	370/329
*	E	US-2012/0140708 A1	06-2012	Choudhury et al.	370/328
*	F	US-8,265,030 B2	09-2012	Miki et al.	370/330
*	G	US-2012/0314675 A1	12-2012	Vujcic, Dragan	370/329
*	H	US-2013/0003700 A1	01-2013	Zhang et al.	370/331
*	I	US-2013/0010721 A1	01-2013	Aiba et al.	370/329
*	J	US-2013/0034073 A1	02-2013	Aiba et al.	370/329
*	K	US-8,447,343 B2	05-2013	Gerstenberger et al.	455/522
*	L	US-2013/0136084 A1	05-2013	ZHANG et al.	370/329
*	M	US-8,472,368 B2	06-2013	Baldemair et al.	370/318

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	N					
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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-8,634,358 B2	01-2014	Damnjanovic et al.	370/329
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012	06/27/2013	04/30/2014						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
	4	✓	✓	✓						
	5	✓	✓	✓						
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	30	✓	✓	✓						
	31	✓	✓	✓						
	32	✓	✓	✓						
	33	✓	✓	✓						
	34	✓	✓	✓						

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	allocation with (PUSCH PUCCH UL (up$1link)) and "20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:19
L2	1	allocation and (PUSCH PUCCH UL (up$1link)) and "20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:21
L3	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:32
S1	1	"12896993"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 17:09
S2	367	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:04
S3	176	S2 and (radio near3 resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S4	28	S2 and (radio near3 resource) and (component with carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S5	173	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S6	137	S5 and (scheduling)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S7	36	("20120263121" | "20110310856" | "20120127950" | "20110310819 " | "20120275395" | "20120287828" | "20120039291" | "20100271970" | "20120307781" | "20110286436" |	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:15

		"20120224535" | "20120140708" | "20110310820" | "20120163288" | "20110299486" | "20100098012" | "20120082125 " | "20120294273" | "20110268048" | "20120113910").pn.				
S8	127	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (carrier adj aggregation)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 10:16
S9	2	"20110292887"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:17
S11	25	((first 1st) adj6 component adj3 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:22
S12	1718	((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S13	66	(carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S14	10842	455/509,522,456.6,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S15	28232	370/329,252,331.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S16	102	(S14 S15) and (downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:42
S17	1	"13140333"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S18	2	"20110310856"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S19	38	((first 1st) adj6 component adj3 carrier) same ((radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31

S20	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S21	27	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj4 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S22	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S23	24	(carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:48
S24	8	("7551898" | "7649960" | "7656843" | "7773699").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:14
S25	2	"20110292900"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:36
S26	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:37
S27	3	"8050202"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:38
S28	1	"20120307689"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:45
S29	2	"8160017"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S30	2	"20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S31	2	"20090016278"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:16

S32	2	"8265030"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:19
S33	3	"2008139923"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 18: 17
S34	14	("20100098012" | "20100232373" | "20110310856" | "20120020317" | "20120082125" | "20120140708" | "8265030").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:19
S35	7	"455"/$.ccls. and (carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:22
S36	9	"455"/$.ccls. and (((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 21:37
S37	57	((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:21
S38	4	("20070053294" | "20100290405").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S39	16	("7596114" | "20050013279" | "20030219028" | "20070217406" | "20020105970" | "20060050664" | "20090303938" | "20070064669").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S40	290	(first 1st) with (component near2 carrier) with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:07
S41	114	(first 1st) with (component near2 carrier) with down$1link and receiv$3 near3 control near3 information	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:09
S42	47	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:29
S43	26	S42 and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2013/06/17 12:31

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			IBM_TDB			
S44	5	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) same (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:46
S45	26	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:47
S46	31	(second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:49
S47	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:51
S48	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:52
S49	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:53
S50	1	@ad<"20091005" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:55
S51	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:56
S52	20	(second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 13:31
S53	16	(set near3 radio near3 resource) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:14
S54	27	(set near3 ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:19
S55	755	(((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2013/06/17 14:25

			IBM_TDB			
S56	70	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:26
S57	327	(((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 downlink reverse)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27
S58	29	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27
S59	24	((second 2nd other) with ((radio near3 resource) (resource adj block))) same (component adj carrier) same (down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:31
S60	10	("20090097447" | "20110081856" | "20090116427" | "20100232373" | "8331307").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:49
S61	2562	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:16
S62	739	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S63	259	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S64	39	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S65	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S66	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20
S67	47	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2013/06/17 15:20

			IBM_TDB			
S68	356	"455"/$.ccls. and ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:10
S70	19	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:17
S71	0	("2013/0107855").URPN.	USPAT	OR	ON	2013/06/18 09:15
S72	0	("2013/0107855").URPN.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:16
S73	408	set near3 (radio frequency) near2 (resource band) same downlink and component	US-PGPUB; USPAT	OR	ON	2013/06/18 09:18
S74	17	set near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:19
S75	19	(set group Cluster) near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:21
S76	12	("8457060" | "20110310819" | "20100271970" | "20130034073" | "20100098012" | "20110310856" | "20110317653" | "20130083742" | "20130083741" | "20120114021" | "20120275395" | "20110317645" | "20110310856").pn.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:31
S77	200	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:37
S78	2911	(UL up$link) with (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S79	110	S77 and S78	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S80	3	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (set group) near6 (radio resource) with (2nd second other another) near2 component	US-PGPUB; USPAT	OR	ON	2013/06/18 10:47
S81	28	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:17
S82	5	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (second 2nd) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:20
S83	4	(1st first first primary initia) near3 (set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:50

S84	3	(set group) near6 (radio resource) with (2nd second other another) near6 (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:52
S85	42	(set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:58
S86	30	(set group) near3 ((radio resource)(resource near2 block)) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 14:07
S87	2	(second 2nd) near3 (down$1link DL) with ((component near3 carrier) CC) same (set group) with ((radio near2 resource) (resource near2 block))	US-PGPUB; USPAT	OR	ON	2013/06/18 14:14
S88	21	reserv$3 with component near3 carrier and (second near2 (radio frequency band))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/25 15:31
S89	36	"739528"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:34
S90	30	"5754138"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:35
S91	2046	(carrier near3 aggregation) and up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:24
S92	1052	(carrier near3 aggregation) and (component near3 carrier) same up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:26
S93	110	(carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:27
S95	17	("370"/$.ccls "455"/$.ccls.) and (aggregation) and (CC (component near3 carrier)) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:22
S96	67	370/329,341,348,395.4.ccls. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:26
S97	345368	schedule (DL (down adj link) down$1link) and (carrier near3 aggregation) and ((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:45

S98	9	schedule near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:46
S99	35	(schedule allocat$4) near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:48
S100	0	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CCcomponent adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S101	216	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S102	43	(1st first) near3 (radio band resource frequency) with (reserv$3 schedul$3 allocat$3) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:15
S103	22	("20100142455" | "20120009923" | "20100254329" | "20100091678" | "20110194501" | "20130010619" | "20080310359" | "20060274712" | "20100227569" | "20120208583" | "20110267978").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 09:57
S104	10	("20100254329" | "20100195624" | "20100023282" | "20090274100" | "20080316957").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 10:15
S105	50	("20100322173" | "20110081913" | "20130010721" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:25
S106	13348	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:40
S107	4330	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR;	OR	ON	2014/04/22 13:42

			DERWENT; IBM_TDB			
S108	4200	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:43
S109	3823	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:44
S110	6130	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:44
S111	370	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near3 carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:45
S112	365	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near3 carrier) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:46
S113	357	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near carrier) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:47
S114	13	(S106 S107 S108 S109 S110) and (DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:47
S115	40	(H03F3/211, H04B7/0617, H04B7/0669, H04B1/3833, H04M1/0247, H04M1/0237, H04L29/08657, G01S5/0252, G01S5/02, H04W52/367, H04W52/12, H04W52/40, H04W88/08, H04W72/044, H04W72/042).cpc. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 14:17
S116	8750	(H04W88/08, H04W72/044, H04W72/042l).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:21
S117	4336	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:22
S118	4205	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT;	OR	ON	2014/04/26 14:23

			USOCR; DERWENT; IBM_TDB			
S119	4144	(H04L29/08657, G01S19/14, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:23
S120	3826	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:24
S121	47	(H04W88/08, H04W72/044, H04W72/042).cpc. and (1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:27
S122	25	(S116 S117 S118 S119 S120).cpc. and (1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 15:35
S123	13432	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S124	4341	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S125	4208	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S126	3833	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S127	6154	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S128	98	(S123 S124 S125 S126 S127) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S129	52	(S123 S124 S125 S126 S127) and (schedul$4 near3 down$1link) and (component near3 carrier) and single near6 carrier same (plurality multiple several) near3 (DL down$1link) with carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04

S130	4	(S123 S124 S125 S126 S127) and (schedul$4) with component near3 carrier and (single near3 (DL down$1link)) with (first with resource) and (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:37
S131	2	(up$1link UL) and (schedul$4) with component near3 carrier same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:40
S132	2	(schedul$4) with component near3 carrier same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:42
S133	2	(schedul$4) same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:44
S134	2	(schedul$4) same (single near3 (DL down$1link)) with (first with (frequency resource block)) same (multiple plurality several) near3 (DL downlink) with second with (frequency block resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:45
S135	16	(single near3 (DL down$1link)) with (first with (frequency resource block)) same (multiple plurality several) near3 (DL downlink) with second with (frequency block resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:45

EAST Search History (Interference)

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4/30/2014 2:59:21 PM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

CPC- SEARCHED		
Symbol	Date	Examiner
H04W88/08, H04W72/044, H04W72/042	4/22/2014 & 4/30/2014	
H04W52/367, H04W52/12, H04W52/40	4/22/2014 & 4/30/2014	Talukder
H04L29/08657, G01S5/0252, G01S5/02	4/22/2014 & 4/30/2014	Talukder
H04B1/3833, H04M1/0247, H04M1/0237	4/22/2014 & 4/30/2014	Talukder
H03F3/211, H04B7/0617, H04B7/0669	4/22/2014 & 4/30/2014	

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
455	509,522,456.6,137,103,575	12/11/2012	Talukder
370	329,252,331	12/11/2012	Talukder
455	Text	6/17/2013	
370	329,341,348,395.4	6/26/2013	

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	12/10/2012	talukder
East Search	12/11/2012	talukder
East Search	6/17/2013	talukder
East Search	6/18/2013	talukder
East Search	6/26/2013	talukder
East Search	6/27/2013	

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SEARCH NOTES		
Search Notes	**Date**	**Examiner**
East Search	4/22/2014 & 4/30/2014	

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: ASTELY, David *et al.*		
Serial No.: 12/896,993		Examiner: TALUKDER, MD K.
Filed: October 4, 2010		Group Art Unit: 2648
For: PUCCH RESOURCE ALLOCATION FOR CARRIER AGGREGATION FOR LTE-ADVANCED		Confirmation No.: 1015
Docket No: 4015-6942		

RESPONSE AND AMENDMENT TO NON-FINAL OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Honorable Sir:

In response to the May 5, 2014 Non-Final Office Action from Examiner M.D. K. Talukder of Art Unit 2648, Applicants timely submit this Response and Amendment to Non-Final Office Action ("*Response*"). In view of this *Response*, Applicants believe that all pending claims are in condition for allowance and issuance.

Amendments to the Claims are reflected in the listing, which begins on page 2 of this paper.

Remarks/Arguments begin on page 11 of this paper.

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AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions and listings of claims in the Application:

1. (Currently amended) A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to said user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a ~~first~~ single downlink component carrier associated with **a primary cell**~~an uplink primary component carrier~~, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on **an**~~the~~ uplink ~~primary~~ component carrier associated with **the primary cell**~~said first downlink component carrier~~, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the ~~first~~ **single** downlink component carrier **associated with the primary cell**; and

if the user terminal is scheduled to receive downlink transmissions on ~~a second single downlink component carrier or~~ multiple downlink component carriers **including the single downlink component carrier associated with the primary cell**, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the ~~second downlink component carrier and/or~~ multiple **downlink** component carriers **and the second set of resources are additional resources as compared to the first set of resources**.

2. (Currently amended) The method of claim 1 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**.

3. (Currently amended) The method of claim 2 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly

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indicate the second set radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**.

4. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

5. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index.

6. (Original) The method of claim 5 wherein the explicit indication is transmitted as radio resource control signaling.

7. (Currently amended) The method of claim 1 further comprising transmitting an acknowledgement resource indication on **the single[[a]]** downlink component carrier **associated with the primary cell** to dynamically assign said second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell** to the user terminal when the user terminal is scheduled to receive downlink transmissions on the ~~second single downlink component carrier or~~ multiple downlink component carriers.

8. (Original) The method of claim 7 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

9. (Currently amended) A base station comprising:

a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and

a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to**:**

schedule downlink transmissions to a user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a ~~first~~ single downlink component carrier associated with **a primary cell**~~an uplink primary component carrier~~, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on **an**~~the~~ uplink ~~primary~~ component carrier associated with **the primary cell**~~said first downlink component carrier~~, wherein the first set of

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radio resources is reserved for user terminals scheduled to receive downlink transmissions on the ~~first~~ **single** downlink component carrier **associated with the primary cell**; and

if the user terminal is scheduled to receive downlink transmissions on ~~a second single downlink component carrier or~~ multiple downlink component carriers **including the single downlink component carrier associated with the primary cell**, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the ~~second downlink component carrier and/or~~ multiple **downlink** component carriers **and the second set of resources are additional resources as compared to the first set of resources**.

10. (Currently amended) The base station of claim 9 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**.

11. (Currently amended) The base station of claim 10 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**.

12. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources implicitly by sending at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

13. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources explicitly by sending an uplink control channel index.

14. (Original) The base station of claim 13 wherein the controller is further configured to send the explicit indication as radio resource control signaling.

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15. (Currently amended) The base station of claim 9 wherein the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell** to the user terminal when the user terminal is scheduled to receive downlink transmissions on the ~~second single downlink component carrier or~~ multiple downlink component carriers.

16. (Original) The base station of claim 15 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

17. (Currently amended) A method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising:

receiving an assignment of radio resources for downlink transmissions from a base station;

transmitting**, on a first set of radio resources on an uplink component carrier associated with a primary cell,** control information associated with the downlink transmissions ~~on a first set of radio resources on an uplink primary component carrier~~ if an assignment of a single downlink component carrier associated with the **primary cell**~~uplink primary component carrier~~ is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the **single**~~first~~ downlink component carrier **associated with the primary cell**; and

transmitting**, on a second set of radio resources on the uplink component carrier associated with the primary cell,** control information associated with the downlink transmissions ~~on a second set of radio resources on the uplink component carrier~~ if an assignment of multiple downlink component carriers **including the single downlink component carrier associated with the primary cell** for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the ~~second downlink component carrier and/or~~ multiple **downlink** component carriers **and the second set of resources are additional resources as compared to the first set of resources**.

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18. (Currently amended) The method of claim 17 further comprising transmitting user data on the second set of radio resources if a single downlink component carrier **associated with a non-primary cell** is assigned for the downlink transmission.

19. (Currently amended) The method of claim 17 further comprising receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell**.

20. (Currently amended) The method of claim 19 wherein receiving control information comprises receiving **at least** one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources.

21. (Original) The method of claim 19 wherein receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources.

22. (Original) The method of claim 21 wherein the explicit indication is received as radio resource control signaling.

23. (Currently amended) The method of claim 17**,** further comprising receiving, from a base station, an acknowledgement resource indication on **the single[[a]]** downlink component carrier **associated with the primary cell to** dynamically assign**[[ing]]** said second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell** when the user terminal is scheduled to receive downlink transmissions on the ~~second single downlink component carrier or~~ multiple downlink component carriers.

24. (Original) The method of claim 23 further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

25. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

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a controller to select radio resources for transmission of control information associated with the downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink ~~**primary-**~~component carrier **associated with a primary cell** if an assignment of a single downlink component carrier associated with the **primary cell**~~**uplink primary component carrier**~~ is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the **single**~~**first**~~ downlink component carrier **associated with the primary cell**; and

select a second set of radio resources on the uplink component carrier **associated with the primary cell** if an assignment of multiple downlink component carriers **including the single downlink component carrier associated with the primary cell** for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the ~~**second downlink component carrier and/or**~~ multiple **downlink** component carriers **and the second set of resources are additional resources as compared to the first set of resources**.

26. (Currently amended) The user terminal of claim 25 configured to transmit user data on the second set of radio resources if a single downlink component carrier **associated with a non-primary cell** is assigned for the downlink transmission.

27. (Currently amended) The user terminal of claim 25 wherein the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink ~~**primary**~~ component carrier **associated with the primary cell**.

28. (Original) The user terminal of claim 27 wherein the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources.

29. (Currently amended) The user terminal of claim 27 wherein the controller is further configured to receive an uplink control channel index explicitly identifying the second set of radio resources on the uplink ~~**primary-**~~component carrier **associated with the primary cell**.

30. (Original) The user terminal of claim 29 wherein the controller is further configured to receive the explicit indication as radio resource control signaling.

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31. (Currently amended) The user terminal of claim 25 wherein the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink ~~primary~~ component carrier **associated with the primary cell** when the user terminal is scheduled to receive downlink transmissions on the ~~second single downlink component carrier or~~ multiple downlink component carriers.

32. (Original) The user terminal of claim 31 wherein the controller is configured to select the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

33. (Currently amended) A method implemented by a user terminal in a mobile communication network, the method comprising:

receiving an assignment of radio resources for a downlink transmissions from a base station;

transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink ~~primary~~ component carrier **associated with a primary cell** if an assignment of a first downlink component carrier associated with the **primary cell**~~uplink primary component carrier~~ is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier **associated with the primary cell**; and

transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier **associated with the primary cell** if an assignment of **the first downlink component carrier associated with the primary cell and** a second **single** downlink component carrier **associated with a non-primary cell** for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on **the first downlink component carrier and** the second **single** downlink component carrier ~~and/or multiple component carriers~~ **and the second set of resources are additional resources as compared to the first set of resources**.

34. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

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a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with downlink transmission**s**, the controller configured to:

select a first set of radio resources on an uplink ~~**primary**~~ component carrier **associated with a primary cell** if an assignment of a first downlink component carrier associated with the **primary cell**~~**uplink primary component carrier**~~ is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier **associated with the primary cell**; and

select a second set of radio resources on the uplink component carrier **associated with the primary cell** if an assignment of **the first downlink component carrier associated with the primary cell and** a second **single** downlink component carrier **associated with a non-primary cell** for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on **the first downlink component carrier and** the second **single** downlink component carrier ~~**and/or multiple component carriers**~~ **and the second set of resources are additional resources as compared to the first set of resources**.

35. (New) The method of claim 1, further comprising:

receiving user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

36. (New) The method of claim 1, further comprising:

receiving control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

37. (New) The base station of claim 9, further configured to:

receive user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

38. (New) The base station of claim 9, further configured to:

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receive control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

39. (New) The method of claim 17, further comprising:

transmitting control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

40. (New) The user terminal of claim 25, further configured to:

transmit control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

41. (New) The method of claim 1, further comprising:

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier associated with a non-primary cell, receiving control information associated with the downlink transmissions to the user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second single downlink component carrier.

42. (New) The base station of claim 9, further configured to:

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier associated with a non-primary cell, receive control information associated with the downlink transmissions to the user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second single downlink component carrier.

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REMARKS/ARGUMENTS

THE CURRENT REJECTION

In the Non-Final Office Action mailed May 5, 2014, Claims 1-34 have received a non-final rejection. Claims 1-34 have received an obviousness rejection as being unpatentable over U.S. Pat. App. Pub. No. 2010/0232373 by Nory *et al.* ("*Nory*") in view of U.S. Pat. App. Pub. No. 2010/0271970 by Pan *et al.* ("*Pan*").

After entry of this *Response*, Claims 1-42 are pending. Claims 1-3, 7, 9-11, 15, 17-20, 23, 25-27, 28, 31 and 33-34 are amended. Claims 35-42 are newly added. No new matter is introduced by the present *Response*. Applicants respectfully assert that the pending claims are in condition for allowance and respectfully request reconsideration of the claims in light of the following remarks.

THE EXAMINER INTERVIEW

Pursuant to the provisions of 37 C.F.R. § 1.133(b), Applicants wish to make of record the substance of the interview between Applicants' undersigned representative, Edward M. Roney of Coats & Bennett PLLC, and Examiner M.D. Talukder conducted telephonically on August 27, 2014. In the interview, the attendees discussed distinctions of the present disclosure over the cited prior art but no agreement was reached.

THE OBVIOUSNESS REJECTIONS

Claims 1-34 are rejected as being unpatentable over *Nory* in view of *Pan*. For at least the reasons set forth in this *Response*, Applicants respectfully submit that *Nory* and *Pan* fail to teach one or more of the claim elements of amended Claims 1-34. Applicants have amended Claim 1 to include "if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell," as described in the listing of claims. Further, Applicants have amended Claim 1 to include "if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including

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the single downlink component carrier associated with the primary cell, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources," as described in the listing of claims (emphasis added).

Applicants submit that amended Claim 1 is allowable at least because *Nory* and *Pan* fail to teach the method of amended Claim 1. Instead, *Nory* teaches that "if the UE is configured to receive PDSCH on a set of two component carriers, a first set of [bits] in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining [bits] can signal the resource block allocation for the second component carrier." *Nory*, para. [0036], lns. 9-14. *Nory* fails to teach, among other things, using "a first set of radio resources on an uplink component carrier associated with the primary cell," "a second set of radio resources on the uplink component carrier associated with the primary cell," and "the second set of resources are additional resources as compared to the first set of resources." Thus, *Nory* fails to teach amended Claim 1.

Pan also fails to teach amended Claim 1. *Pan* teaches that "[f]or asymmetric carrier aggregation in which there are more configured DL carriers than UL component carriers, the WTRU may use UCI grouping in conjunction with single or multiple PUCCH(s) . . . to transmit the UCI." *Pan*, para. [0036], lns. 1-7. Further, *Pan* teaches that "the WTRU may use a two step procedure to send the UCI" consisting of "[f]irst, the WTRU associates UL component carriers with DL component carriers and creates UCI groups with different types for UCI transmission . . . " and "[s]econd, the WTRU uses periodic PUCCH for type 1 UCI groups and uses periodic PUSCH, PUCCH or combinations of PUCCH/PUSCH for transmitting UCIs corresponding to multiple DL carriers for type 2 UCI groups." *Pan*, para. [0036], lns. 8-14 and FIGS. 4, 5, 6, 7 and 10 (below). *Pan* fails to teach, among other things, using the same "uplink component carrier" for both "a single downlink component carrier" and "multiple downlink component carriers." Thus, *Pan* also fails to teach amended Claim 1.

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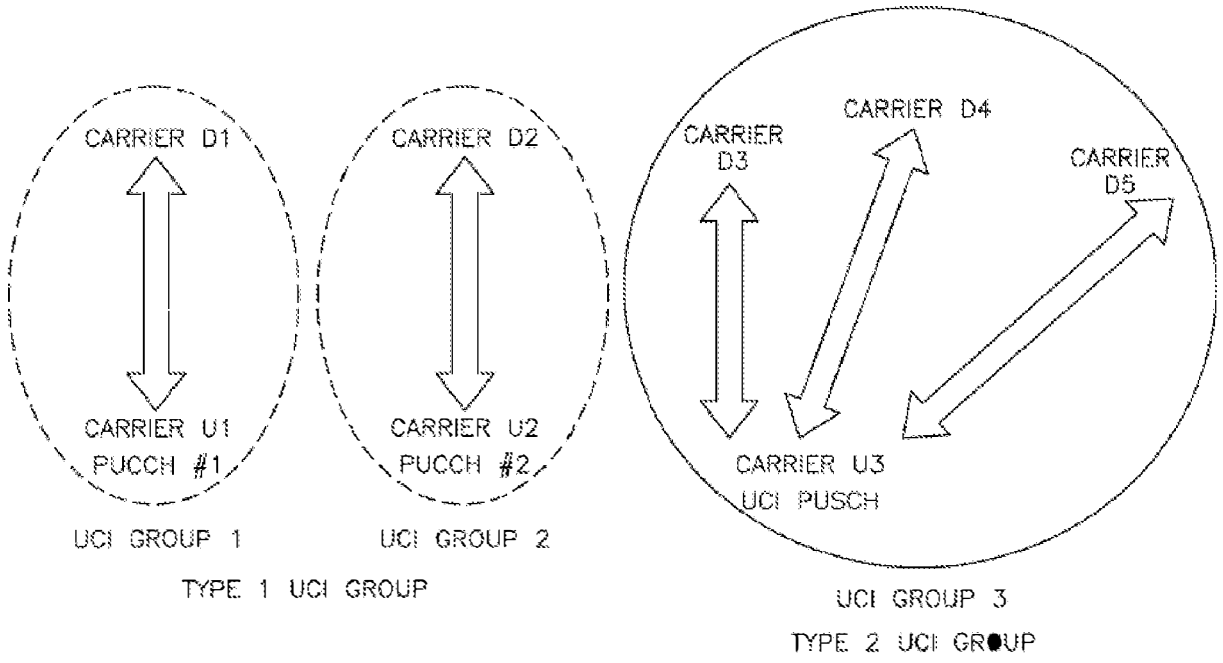

FIG. 10

Therefore, for at least the reasons given in this *Response*, Applicants submit that Claims 1-34 are allowable over *Nory* in view of *Pan* and respectfully request that the rejection of Claims 1-34 be withdrawn.

THE FEES

This *Response* is being filed within four months of the May 5, 2014 Non-Final Office Action. Thus, a one month extension of time fee is believed due with this submission. Claim fees for eight (8) additional dependent claims are believed due, as the total claim count has increased from thirty-four (34) claims to forty-two (42) claims. The number of independent claims remain covered under the original filing fee. Applicants authorize the Commissioner to charge deposit account No. 18-1167 for any fees deemed due.

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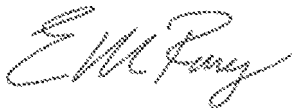
CONCLUSION

In view of the distinctions herein between the subject matter of the present claims and the teachings of the cited references, Applicants respectfully request reconsideration and allowance of the present application. By the present *Response*, the application has been placed in full condition for allowance. Accordingly, Applicants respectfully request early and favorable action. Should the Examiner disagree or have any questions or issues regarding this submission, Applicants respectfully request that the Examiner telephone the undersigned at (919) 719-4870.

Favorable consideration is respectfully and earnestly solicited.

Respectfully submitted,



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Dated: September 5, 2014

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Certificate of E-Filing/Transmission under 37 CFR § 1.8:

In accordance with 37 CFR § 1.8, I certify that this correspondence is being deposited and electronically filed with the USPTO via the USPTO's EFS-Web Electronic Filing System.

Dated: September 5, 2014

/Edward M. Roney/
Edward M. Roney
Registration No. 62,048

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Electronic Patent Application Fee Transmittal

Application Number:	12896993
Filing Date:	04-Oct-2010
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Filer:	Edward Milton Roney/Kenyatta Upchurch
Attorney Docket Number:	4015-6942

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in Excess of 20	1202	8	80	640
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
		Total in USD ($)		**840**

Electronic Acknowledgement Receipt

EFS ID:	20055453
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	Edward Milton Roney/Kenyatta Upchurch
Filer Authorized By:	Edward Milton Roney
Attorney Docket Number:	4015-6942
Receipt Date:	05-SEP-2014
Filing Date:	04-OCT-2010
Time Stamp:	11:26:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$840
RAM confirmation Number	9010
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

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1		P30138-US2_Response_to_Non-Final_OA.pdf	115837 8270ecb420ca91ba54bfef10bcacc048ebb218f4	yes	14

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	10
Applicant Arguments/Remarks Made in an Amendment	11	14

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	32060 efeb78c1fccaef0ff76743bf2a559391d13c7ec7	no	2

Warnings:

Information:

Total Files Size (in bytes):	147897

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/896,993	Filing Date 10/04/2010	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	09/05/2014	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 42	Minus	** 34	= 8	x $80 =	640
	Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	x $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**640**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/eugenia v. hardy/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942	1015

24112 7590 09/08/2014
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER	
TALUKDER, MD K	

ART UNIT	PAPER NUMBER
2648	

MAIL DATE	DELIVERY MODE
09/08/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	12/896,993	ASTELY ET AL.	
	Examiner	Art Unit	
	MD TALUKDER	2648	

All participants (applicant, applicant's representative, PTO personnel):

(1) *MD TALUKDER.* (3)____.

(2) *ED Roni.* (4)____.

Date of Interview: *27 August 2014.*

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1.*

Identification of prior art discussed: *Nory.*

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

During the interview various aspects of the claimed invention were discussed and compared with the cited reference in view of the pending claim rejections. The foregoing amendments to the claims were made in consideration of the topics of discussion during the interview; while no agreement was reached with respect to allowability..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/MD TALUKDER/ Examiner, Art Unit 2648	/YUWEN PAN/ Supervisory Patent Examiner, Art Unit 2649

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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942	1015

24112 7590 11/26/2014
COATS & BENNETT, PLLC
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EXAMINER
TALUKDER, MD K

ART UNIT	PAPER NUMBER
2648	

MAIL DATE	DELIVERY MODE
11/26/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 12/896,993	Applicant(s) ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/05/2014*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-42* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-42* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

2. It would be of great assistance to the office if all incoming papers pertaining to a filed application carried the following items:

i. Application number (checked for accuracy, including series code and serial no.).
ii. Group art unit number (copied from most recent Office communication).
iii. Filing date.
iv. Name of the examiner who prepared the most recent Office action.
v. Title of invention.
vi. Confirmation number (See MPEP § 503).

REMARKS

3. Examiner wish to make of record the substance of the examiner initiated interview between examiner and applicant's undersigned representative, Edward M. Roney of Coats & Bennett PLLC, conducted telephonically. In the interview, Examiner was able to point out the allowable subject matter but the applicant was reluctant to amend the claims according to examiner's proposal.

Response to Arguments

4. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

5. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

a. Claims 1-34 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Regarding claim 1, claims recites the limitation "if the user terminal…single downlink component carrier…" in line 5-6 & "If the user…multiple downlink component carriers…" in line 12-13. It is not clear if the functional language recited afterwards is optional steps or required functionality. Examiner read the functional language recited afterwards (after "IF") is optional step (broadest reasonable interpretation being applied). The second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional. Other independent claims having the same "If statement". For the purpose of expediting the processing of the application, Claims have been rejected in view of the prior art (see below) based on a broader interpretation that meets the claimed subject matter as interpreted by the Examiner.

b. New claims 35-42 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. It is not clear if the functional language recited afterwards is optional steps or required

functionality. The functional language recited afterwards (After "If") is optional (interpret by the examiner). The "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional. Therefore, those claims do not have any patentable weight.

Claim Rejection- 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained through the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nory (Pub No. 2010/0232373) and further in view of Marinier (Pub No. 2010/0322173).

Regarding claim 1, Nory teaches a method implemented by a base station of receiving control information from a user terminal (**Fig. 3 & 1: BS-101 receives control information from user terminals**), the method comprising: scheduling downlink transmissions to said user terminal on one or more downlink component carriers (scheduling- Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…");** if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**), receiving control

information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17).** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers,

as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 2, 10, Nory teaches that the control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier (abstract: "**…The transceiver is also configured to receive a second control message on the anchor carrier, the second control message associated with a set of component carriers, the set of component carriers are distinct from the anchor carrier. The controller determines a resource assignment for at least one component carrier in the set of component carriers using both the first and the second control messages**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 3, 11, Nory teaches transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the**

RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 4, 12, Nory teaches at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier (**Fig. 3**).

Regarding claim 5, 13, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Regarding claim 6, 14, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access. Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").**

Regarding claim 7, 15, Nory teaches transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers**") and (Para. **26, 36 & 40**).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 8, 16, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers**").

Regarding claim 9, Nory teaches a base station comprising: a transmitter to transmit user data on one or more downlink component carriers to a user terminal (**Fig. 1: transmission from BS-101 to remote unit-110**); and a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to schedule downlink transmissions to a user terminal on one or more downlink component carriers (scheduling- Para. 49: **"…If a sub frame**

n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…"); if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**), receiving control information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17).** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 17, Nory teaches a user terminal of transmitting control information in a mobile communication network, the method comprising: receiving an assignment of radio resources for downlink transmissions from a base station (**Fig. 3 & 4 and Abstract: "A wireless communication terminal including a controller coupled to a wireless transceiver wherein the transceiver is configured to receive a first control message on an anchor carrier, the first control message including a resource assignment for the anchor carrier"**); transmitting on a first set of radio resources on an uplink component carrier, control information with the downlink transmission if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**) & (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier.**

In addition to this, if the UE is configured to receive PDSCH on only one component carrier), wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier **(Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17).** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 18, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier**

then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each").

Regarding claim 19, Claim 19 corresponds to claim 2 and is analyzed accordingly.

Regarding claim 20, Claim 20 corresponds to claim 3 and is analyzed accordingly.

Regarding claim 21, Claim 21 corresponds to claim 5 and is analyzed accordingly.

Regarding claim 22, Claim 22 corresponds to claim 6 and is analyzed accordingly.

Regarding claim 23, Claim 23 corresponds to claim 7 and is analyzed accordingly.

Regarding claim 24, Claim 24 corresponds to claim 8 and is analyzed accordingly.

Regarding claim 25 & 33 & 34, claim **25 & 33 & 34** corresponds to claim 17and/or 1, and is analyzed accordingly.

Regarding claim 26, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 27, Nory teaches the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 28, Nory teaches the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources (**Fig. 3**).

Regarding claim 29, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 30, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected**

to only monitor PDCCH messages from the anchor carrier after initial access. Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").

Regarding claim 31, Nory teaches the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers**") and (Para. **26, 36 & 40**).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in

the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 32, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers**").

Regarding Claims 35 to 42, The functional language recited afterwards (After "If") is optional. The "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional. Therefore, those claims do not have any patentable weight.

CONCLUSION

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication from the examiner should be directed to Patent Examiner Md Talukder whose telephone number is (571) 270-3222. The examiner can normally be reached on Mon-Th 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Wesley Kim can be reached on 571-272-7867.

Information regarding the status of an application may be obtaining from the patent application information retrieval (PAIR) system. Status information for the published applications may be obtained from either private PAIR or public PAIR. Status information for unpublished application is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the

private PAIR system, contract the Electronics Business Center (EBC) at 866-217-9197. If you would like assistance from USPTO customer service representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA).

/ Md. Talukder /

/ Art Unit # 2648 /

/WESLEY KIM/
Supervisory Patent Examiner, Art Unit 2648

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	12/896,993	ASTELY ET AL.	
	Examiner	Art Unit	
	MD TALUKDER	2648	

All participants (applicant, applicant's representative, PTO personnel):

(1) *MD TALUKDER.* (3) *Edward Roney.*

(2) *Wesley Kim.* (4)_____.

Date of Interview: *31 October 2014.*

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Examiner proposed amendments to expedite prosecution by amending to overcome the 112 issues directed to the "IF" conditions. The applicants' representative was reluctant to amend the claims according to examiner's proposal..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/MD TALUKDER/ Examiner, Art Unit 2648	/WESLEY KIM/ Supervisory Patent Examiner, Art Unit 2648

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Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 1 of 3

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0160784 A1	10-2002	Kuwahara et al.	455/452
*	B	US-2010/0003997 A1	01-2010	KOYANAGI, Kenichiro	455/450
*	C	US-2010/0098012 A1	04-2010	Bala et al.	370/329
*	D	US-2010/0208679 A1	08-2010	Papasakellariou et al.	370/329
*	E	US-2010/0232373 A1	09-2010	Nory et al.	370/329
*	F	US-2010/0271970 A1	10-2010	Pan et al.	370/252
*	G	US-2010/0285809 A1	11-2010	Lindstrom et al.	455/450
*	H	US-2010/0296389 A1	11-2010	Khandekar et al.	370/216
*	I	US-2010/0322173 A1	12-2010	Marinier et al.	370/329
*	J	US-2011/0007695 A1	01-2011	Choi et al.	370/329
*	K	US-2011/0007699 A1	01-2011	Moon et al.	370/329
*	L	US-2011/0081913 A1	04-2011	Lee et al.	455/450
*	M	US-2011/0081932 A1	04-2011	Astely et al.	455/509

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	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 2 of 3

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*	A	US-2011/0243039 A1	10-2011	PAPASAKELLARIOU et al.	370/280
*	B	US-2011/0310856 A1	12-2011	Hariharan et al.	370/336
*	C	US-2012/0020317 A1	01-2012	Ishii et al.	370/329
*	D	US-2012/0051306 A1	03-2012	Chung et al.	370/329
*	E	US-2012/0082125 A1	04-2012	Huang, Yada	370/329
*	F	US-2012/0140708 A1	06-2012	Choudhury et al.	370/328
*	G	US-8,265,030 B2	09-2012	Miki et al.	370/330
*	H	US-2012/0314675 A1	12-2012	Vujcic, Dragan	370/329
*	I	US-2013/0010721 A1	01-2013	Aiba et al.	370/329
*	J	US-2013/0003700 A1	01-2013	Zhang et al.	370/331
*	K	US-2013/0034073 A1	02-2013	Aiba et al.	370/329
*	L	US-8,447,343 B2	05-2013	Gerstenberger et al.	455/522
*	M	US-2013/0136084 A1	05-2013	ZHANG et al.	370/329

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 3 of 3

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*	A	US-8,472,368 B2	06-2013	Baldemair et al.	370/318
*	B	US-8,634,358 B2	01-2014	Damnjanovic et al.	370/329
*	C	US-8,792,830 B2	07-2014	Lim et al.	455/59
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

CPC- SEARCHED

Symbol	Date	Examiner
H04W88/08, H04W72/044, H04W72/042	4/22/2014 & 4/30/2014 & 10/31/2014	
H04W52/367, H04W52/12, H04W52/40	4/22/2014 & 4/30/2014 & 10/31/2014	Talukder
H04L29/08657, G01S5/0252, G01S5/02	4/22/2014 & 4/30/2014 & 10/31/2014	Talukder
H04B1/3833, H04M1/0247, H04M1/0237	4/22/2014 & 4/30/2014	Talukder
H03F3/211, H04B7/0617, H04B7/0669	4/22/2014 & 4/30/2014	

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
455	509,522,456.6,137,103,575	12/11/2012	
370	329,252,331	12/11/2012	Talukder
455	Text	6/17/2013	
370	329,341,348,395.4	6/26/2013	

SEARCH NOTES

Search Notes	Date	Examiner
East Search	12/10/2012	talukder
East Search	12/11/2012	talukder
East Search	6/17/2013	talukder
East Search	6/18/2013	talukder

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SEARCH NOTES		
Search Notes	**Date**	**Examiner**
East Search	6/26/2013	talukder
East Search	6/27/2013	
East Search	4/22/2014 & 4/30/2014	
Text Srarched	10/31/2014	Talukder

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"12896993"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 17:09
S2	367	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:04
S3	176	S2 and (radio near3 resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S4	28	S2 and (radio near3 resource) and (component with carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S5	173	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S6	137	S5 and (scheduling)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S7	36	("20120263121" | "20110310856" | "20120127950" | "20110310819 " | "20120275395" | "20120287828" | "20120039291" | "20100271970" | "20120307781" | "20110286436" | "20120224535" | "20120140708" | "20110310820" | "20120163288" | "20110299486" | "20100098012" | "20120082125 " | "20120294273" | "20110268048" | "20120113910").pn.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:15
S8	127	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (carrier adj aggregation)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 10:16
S9	2	"20110292887"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:17

S11	25	((first 1st) adj6 component adj3 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:22
S12	1718	((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S13	66	(carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S14	10842	455/509,522,456.6,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S15	28232	370/329,252,331.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S16	102	(S14 S15) and (downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:42
S17	1	"13140333"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S18	2	"20110310856"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S19	38	((first 1st) adj6 component adj3 carrier) same ((radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S20	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S21	27	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj4 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S22	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32

S23	24	(carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:48
S24	8	("7551898" | "7649960" | "7656843" | "7773699").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:14
S25	2	"20110292900"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:36
S26	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:37
S27	3	"8050202"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:38
S28	1	"20120307689"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:45
S29	2	"8160017"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S30	2	"20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S31	2	"20090016278"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:16
S32	2	"8265030"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:19
S33	3	"2008139923"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 18:17
S34	14	("20100098012" | "20100232373" | "20110310856" | "20120020317" | "20120082125" | "20120140708" | "8265030").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:19

S35	7	"455"/$.ccls. and (carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:22
S36	9	"455"/$.ccls. and (((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 21:37
S37	57	((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:21
S38	4	("20070053294" | "20100290405").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S39	16	("7596114" | "20050013279" | "20030219028" | "20070217406" | "20020105970" | "20060050664" | "20090303938" | "20070064669").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S40	290	(first 1st) with (component near2 carrier) with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:07
S41	114	(first 1st) with (component near2 carrier) with down$1link and receiv$3 near3 control near3 information	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:09
S42	47	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:29
S43	26	S42 and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:31
S44	5	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) same (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:46
S45	26	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:47
S46	31	(second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:49

S47	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:51
S48	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:52
S49	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:53
S50	1	@ad<"20091005" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:55
S51	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:56
S52	20	(second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 13:31
S53	16	(set near3 radio near3 resource) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:14
S54	27	(set near3 ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:19
S55	755	(((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:25
S56	70	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:26
S57	327	(((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 downlink reverse)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27
S58	29	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27

S59	24	((second 2nd other) with ((radio near3 resource) (resource adj block))) same (component adj carrier) same (down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:31
S60	10	("20090097447" | "20110081856" | "20090116427" | "20100232373" | "8331307").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:49
S61	2562	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:16
S62	739	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S63	259	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S64	39	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S65	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S66	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20
S67	47	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20
S68	356	"455"/$.ccls. and ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:10
S70	19	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:17
S71	0	("2013/0107855").URPN.	USPAT	OR	ON	2013/06/18 09:15
S72	0	("2013/0107855").URPN.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:16

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S73	408	set near3 (radio frequency) near2 (resource band) same downlink and component	US-PGPUB; USPAT	OR	ON	2013/06/18 09:18
S74	17	set near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:19
S75	19	(set group Cluster) near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:21
S76	12	("8457060" | "20110310819" | "20100271970" | "20130034073" | "20100098012" | "20110310856" | "20110317653" | "20130083742" | "20130083741" | "20120114021" | "20120275395" | "20110317645" | "20110310856").pn.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:31
S77	200	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:37
S78	2911	(UL up$link) with (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S79	110	S77 and S78	US-PGPUB; USPAT	OR	ON N	2013/06/18 10:38
S80	3	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (set group) near6 (radio resource) with (2nd second other another) near2 component	US-PGPUB; USPAT	OR	ON	2013/06/18 10:47
S81	28	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:17
S82	5	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (second 2nd) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:20
S83	4	(1st first first primary initia) near3 (set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:50
S84	3	(set group) near6 (radio resource) with (2nd second other another) near6 (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:52
S85	42	(set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:58
S86	30	(set group) near3 ((radio resource)(resource near2 block)) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 14:07
S87	2	(second 2nd) near3 (down$1link DL) with ((component near3 carrier) CC) same (set group) with ((radio near2 resource) (resource near2 block))	US-PGPUB; USPAT	OR	ON	2013/06/18 14:14
S88	21	reserv$3 with component near3 carrier and (second near2 (radio frequency band))	US-PGPUB; USPAT; USOCR; DERWEN T; IBM_TDB	OR	ON	2013/06/25 15:31
S89	36	"739528"	US-PGPUB; USPAT; USOCR; DERWEN T; IBM_TDB	OR	ON	2013/06/26 09:34

S90	30	"5754138"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:35
S91	2046	(carrier near3 aggregation) and up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:24
S92	1052	(carrier near3 aggregation) and (component near3 carrier) same up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:26
S93	110	(carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:27
S95	17	("370"/$.ccls "455"/$.ccls.) and (aggregation) and (CC (component near3 carrier)) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:22
S96	67	370/329,341,348,395.4.ccls. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:26
S97	345368	schedule (DL (down adj link) down$1link) and (carrier near3 aggregation) and ((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:45
S98	9	schedule near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:46
S99	35	(schedule allocat$4) near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:48
S100	0	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CCcomponent adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S101	216	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S102	43	(1st first) near3 (radio band resource frequency) with (reserv$3 schedul$3 allocat$3) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:15

S103	22	("20100142455" | "20120009923" | "20100254329" | "20100091678" | "20110194501" | "20130010619" | "20080310359" | "20060274712" | "20100227569" | "20120208583" | "20110267978").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 09:57
S104	10	("20100254329" | "20100195624" | "20100023282" | "20090274100" | "20080316957").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 10:15
S105	50	("20100322173" | "20110081913" | "20130010721" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:25
S106	13348	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:40
S107	4330	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:42
S108	4200	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:43
S109	3823	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:44
S110	6130	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:44
S111	370	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near3 carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:45
S112	365	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near3 carrier) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:46

S113	357	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near carrier) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:47
S114	13	(S106 S107 S108 S109 S110) and (DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:47
S115	40	(H03F3/211, H04B7/0617, H04B7/0669, H04B1/3833, H04M1/0247, H04M1/0237, H04L29/08657, G01S5/0252, G01S5/02, H04W52/367, H04W52/12, H04W52/40, H04W88/08, H04W72/044, H04W72/042).cpc. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 14:17
S116	8750	(H04W88/08, H04W72/044, H04W72/042l).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:21
S117	4336	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:22
S116	4205	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:23
S119	4144	(H04L29/08657, G01S19/14, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:23
S120	3826	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:24
S121	47	(H04W88/08, H04W72/044, H04W72/042).cpc. and (1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:27
S122	25	(S116 S117 S118 S119 S120).cpc. and (1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 15:35
S123	13432	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S124	4341	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT;	OR	ON	2014/04/30 11:04

			USOCR; DERWENT; IBM_TDB			
S125	4208	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S126	3833	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S127	6154	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S128	98	(S123 S124 S125 S126 S127) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S129	52	(S123 S124 S125 S126 S127) and (schedul$4 near3 down$1link) and (component near3 carrier) and single near6 carrier same (plurality multiple several) near3 (DL down$1link) with carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S130	4	(S123 S124 S125 S126 S127) and (schedul$4) with component near3 carrier and (single near3 (DL down$1link)) with (first with resource) and (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:37
S131	2	(up$1link UL) and (schedul$4) with component near3 carrier same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:40
S132	2	(schedul$4) with component near3 carrier same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:42
S133	2	(schedul$4) same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:44
S134	2	(schedul$4) same (single near3 (DL down$1link)) with (first with (frequency resource block)) same (multiple plurality several) near3 (DL downlink) with second with (frequency block resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:45
S135	16	(single near3 (DL down$1link)) with (first with (frequency resource block)) same (multiple plurality several) near3 (DL downlink) with second with (frequency block resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:45
S136	1	allocation with (PUSCH PUCCH UL (up$1link)) and "20100232373"	US-PGPUB; USPAT;	OR	ON	2014/04/30 14:19

			USOCR; DERWENT; IBM_TDB			
S137	1	allocation and (PUSCH PUCCH UL (up$1link)) and "20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:21
S138	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:32
S139	54	("20100322173" | "20110081913" | "20130010721" | "8634358" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20110243039" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 11:49
S140	15049	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S141	4737	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S142	4341	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S143	4030	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S144	6785	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S145	96	(S140 S141 S142 S143 S144) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier same (frequency resources)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S146	1	"13315135"	US-PGPUB; USPAT;	OR R	ON	2014/10/15 13:54

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			USOCR; DERWENT; IBM_TDB			
S147	2	"20080151845"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 14:58
S148	41	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 15:45
S149	3	"455"/451,452.1.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 18:01
S150	33889	455/451,452.1,509,456.1,522,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:25
S151	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (sererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:32
S152	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (rererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:33
S153	4	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (reserv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:34
S154	3	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (reserv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin) and (CC component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:37
S155	4	"455"/$.ccls. and (((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame)) and (reserv$4 sav$4 us$3) near3 (other 2nd second another) adj3 (resource frequency channel Bin) and (CC component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:39
S156	15	("20050013279" | "20030219028" | "20070217406" | "20020105970" | "20060050664" | "20090303938" | "20070064669").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 12:07
S157	10	"455"/$.ccls. and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2014/10/23 12:07

			IBM_TDB			
S158	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel) same (rererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 15:22
S161	15374	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S162	4758	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S163	4377	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S164	4042	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S165	6867	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S166	99	(S161 S162 S163 S164 S165) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier same (frequency)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S167	1	"14170939"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/17 09:46
S168	499	(component near2 carrier) with (primary near2 cell)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:07
S169	401	"370"/$.ccls. and (component near2 carrier) with (primary near2 cell)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:07
S170	378	"370"/$.ccls. and (component adj2 carrier) with (primary adj2 cell)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:07
S171	185	"370"/$.ccls. and (component adj2 carrier) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2014/11/18 14:08

			IBM_TDB			
S172	4	"370"/$.ccls. and single near3 (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:17
S173	4	single near4 (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:19
S174	287	"370"/$.ccls. and (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:21
S175	1	@ad<"20091004" and "370"/$.ccls. and (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:22
S176	287	"370"/$.ccls. and (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:22

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S159	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel) same (rerer$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; UPAD	OR	ON	2014/10/31 15:24
S160	5	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (set group) near6 (radio resource) with (2nd second other another) near2 component	US-PGPUB; USPAT; UPAD	OR	ON	2014/10/31 15:26

11/18/2014 6:02:16 PM
C:\Users\mtalukder\Documents\EAST\Workspaces\12896993.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012	06/27/2013	04/30/2014	11/18/2014					
	1	✓	✓	✓	✓					
	2	✓	✓	✓	✓					
	3	✓	✓	✓	✓					
	4	✓	✓	✓	✓					
	5	✓	✓	✓	✓					
	6	✓	✓	✓	✓					
	7	✓	✓	✓	✓					
	8	✓	✓	✓	✓					
	9	✓	✓	✓	✓					
	10	✓	✓	✓	✓					
	11	✓	✓	✓	✓					
	12	✓	✓	✓	✓					
	13	✓	✓	✓	✓					
	14	✓	✓	✓	✓					
	15	✓	✓	✓	✓					
	16	✓	✓	✓	✓					
	17	✓	✓	✓	✓					
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	26	✓	✓	✓	✓					
	27	✓	✓	✓	✓					
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	29	✓	✓	✓	✓					
	30	✓	✓	✓	✓					
	31	✓	✓	✓	✓					
	32	✓	✓	✓	✓					
	33	✓	✓	✓	✓					
	34	✓	✓	✓	✓					
	35				✓					
	36				✓					

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	**Art Unit**
	MD TALUKDER	2648

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012	06/27/2013	04/30/2014	11/18/2014					
	37				✓					
	38				✓					
	39				✓					
	40				✓					
	41				✓					
	42				✓					

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	12896993	Filing Date	2010-10-04	Docket Number (if applicable)	4015-6942 / P30138-US2	Art Unit	2648
First Named Inventor	David Astely et al.			Examiner Name	Md K Talukder		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 181167

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Signature of Registered U.S. Patent Practitioner			
Signature	/Edward M. Roney/	Date (YYYY-MM-DD)	2015-03-06
Name	Edward M. Roney	Registration Number	62048

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: David Astely *et al.*			
Serial No.:	12/896,993	Examiner:	MD K. Talukder
Filed:	October 4, 2010	Art Unit:	2648
For:	PUCCH RESOURCE ALLOCATION FOR CARRIER AGGREGATION FOR LTE-ADVANCED	Conf. No.:	1015

RESPONSE AND AMENDMENT WITH REQUEST FOR CONTINUED EXAMINATION

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This paper is being filed in Response to the Final Office Action mailed November 26, 2014 with an express Request for Continued Examination (RCE) under 37 C.F.R. § 1.114. Reconsideration is respectfully requested in light of the remarks below. The Office is hereby authorized to charge any fees required for entry of this paper to Deposit Account 18-1167.

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AMENDMENTS TO THE CLAIMS

1. (Previously presented) A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to said user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell, receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell, receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

2. (Previously presented) The method of claim 1 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink component carrier associated with the primary cell.

3. (Previously presented) The method of claim 2 further comprising transmitting control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink component carrier associated with the primary cell.

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4. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

5. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index.

6. (Original) The method of claim 5 wherein the explicit indication is transmitted as radio resource control signaling.

7. (Previously presented) The method of claim 1 further comprising transmitting an acknowledgement resource indication on the single downlink component carrier associated with the primary cell to dynamically assign said second set of radio resources on the uplink component carrier associated with the primary cell to the user terminal when the user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

8. (Original) The method of claim 7 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

9. (Previously presented) A base station comprising:

a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and

a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to:

schedule downlink transmissions to a user terminal on one or more downlink component carriers;

if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell, receive control information associated with the downlink transmissions to the user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions

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on the single downlink component carrier associated with the primary cell; and

if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell, receive control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

10. (Previously presented) The base station of claim 9 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink component carrier associated with the primary cell.

11. (Previously presented) The base station of claim 10 wherein the controller is further configured to transmit control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the second set of radio resources on the uplink component carrier associated with the primary cell.

12. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources implicitly by sending at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

13. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources explicitly by sending an uplink control channel index.

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14. (Original) The base station of claim 13 wherein the controller is further configured to send the explicit indication as radio resource control signaling.

15. (Previously presented) The base station of claim 9 wherein the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink component carrier associated with the primary cell to the user terminal when the user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

16. (Original) The base station of claim 15 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

17. (Previously presented) A method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising:

receiving an assignment of radio resources for downlink transmissions from a base station;

transmitting, on a first set of radio resources on an uplink component carrier associated with a primary cell, control information associated with the downlink transmissions if an assignment of a single downlink component carrier associated with the primary cell is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

transmitting, on a second set of radio resources on the uplink component carrier associated with the primary cell, control information associated with the downlink transmissions if an assignment of multiple downlink component carriers including the single downlink component carrier associated with the primary cell for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

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18. (Previously presented) The method of claim 17 further comprising transmitting user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

19. (Previously presented) The method of claim 17 further comprising receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink component carrier associated with the primary cell.

20. (Previously presented) The method of claim 19 wherein receiving control information comprises receiving at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources.

21. (Original) The method of claim 19 wherein receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources.

22. (Original) The method of claim 21 wherein the explicit indication is received as radio resource control signaling.

23. (Previously presented) The method of claim 17, further comprising receiving, from a base station, an acknowledgement resource indication on the single downlink component carrier associated with the primary cell to dynamically assign said second set of radio resources on the uplink component carrier associated with the primary cell when the user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

24. (Original) The method of claim 23 further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

25. (Previously presented) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

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a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with the downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink component carrier associated with a primary cell if an assignment of a single downlink component carrier associated with the primary cell is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

select a second set of radio resources on the uplink component carrier associated with the primary cell if an assignment of multiple downlink component carriers including the single downlink component carrier associated with the primary cell for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

26. (Previously presented) The user terminal of claim 25 configured to transmit user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

27. (Previously presented) The user terminal of claim 25 wherein the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink component carrier associated with the primary cell.

28. (Original) The user terminal of claim 27 wherein the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources.

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29. (Previously presented) The user terminal of claim 27 wherein the controller is further configured to receive an uplink control channel index explicitly identifying the second set of radio resources on the uplink component carrier associated with the primary cell.

30. (Original) The user terminal of claim 29 wherein the controller is further configured to receive the explicit indication as radio resource control signaling.

31. (Previously presented) The user terminal of claim 25 wherein the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink component carrier associated with the primary cell when the user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

32. (Original) The user terminal of claim 31 wherein the controller is configured to select the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

33. (Previously presented) A method implemented by a user terminal in a mobile communication network, the method comprising:

receiving an assignment of radio resources for a downlink transmissions from a base station;

transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink component carrier associated with a primary cell if an assignment of a first downlink component carrier associated with the primary cell is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier associated with the primary cell; and

transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier associated with the primary cell if an assignment of the first downlink component carrier associated with the primary cell and a second single downlink component carrier associated with a non-primary cell for the downlink transmission is received,

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wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier and the second single downlink component carrier-and the second set of resources are additional resources as compared to the first set of resources.

34. (Previously presented) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink component carrier associated with a primary cell if an assignment of a first downlink component carrier associated with the primary cell is received for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier associated with the primary cell; and

select a second set of radio resources on the uplink component carrier associated with the primary cell if an assignment of the first downlink component carrier associated with the primary cell and a second single downlink component carrier associated with a non-primary cell for the downlink transmission is received, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier and the second single downlink component carrier-and the second set of resources are additional resources as compared to the first set of resources.

35. (Previously presented) The method of claim 1, further comprising:

receiving user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

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36. (Previously presented) The method of claim 1, further comprising:
receiving control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

37. (Previously presented) The base station of claim 9, further configured to:
receive user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

38. (Previously presented) The base station of claim 9, further configured to:
receive control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

39. (Previously presented) The method of claim 17, further comprising:
transmitting control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

40. (Previously presented) The user terminal of claim 25, further configured to:
transmit control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

41. (Previously presented) The method of claim 1, further comprising:
if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier associated with a non-primary cell, receiving control information associated with the downlink transmissions to the user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second single downlink component carrier.

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42. (Previously presented) The base station of claim 9, further configured to:

if the user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier associated with a non-primary cell, receive control information associated with the downlink transmissions to the user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second single downlink component carrier.

43. (New) A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to said user terminal on one or more downlink component carriers; and

receiving on a first set or a second set of resources on an uplink component carrier associated with a primary cell, including:

if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell, receiving control information associated with the downlink transmissions to the user terminal on the first set of radio resources on the uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell, receiving control information associated with the downlink transmissions to the user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of

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resources are additional resources as compared to the first set of resources.

44. (New) A base station comprising:

a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and

a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to:

schedule downlink transmissions to a user terminal on one or more downlink component carriers; and

receiving on a first set or a second set of resources on an uplink component carrier associated with a primary cell, including:

if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with the primary cell, receive control information associated with the downlink transmissions to the user terminal on the first set of radio resources on the uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell, receive control information associated with the downlink transmissions to the user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

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REMARKS

After entry of this Response, Claims 1-44 are pending. Claims 43 and 44 are newly added. No new matter is introduced by the present Response.

Pursuant to the provisions of 37 C.F.R. § 1.133(b), Applicant wishes to make of record the substance of an interview between Applicant's undersigned representative, Edward M. Roney of Coats & Bennett PLLC, and Examiner MD K Talukder conducted telephonically on October 31, 2014. In the interview, the attendees discussed but did not agree to proposed amendments to overcome the indefiniteness rejection.

Claims 1-42 are rejected for failing to comply with the definiteness requirement. The Office argues that the functional language recited after the limitation "if" is not a required step or required functionality. Office Action, pg. 3. Applicant respectfully disagrees with this line of reasoning. The essential inquiry for determining compliance with the definiteness requirement is whether the claims "set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity." MPEP § 2173.02. The definiteness of a claim is not to be analyzed in a vacuum, but rather in light of the content of the particular application's disclosure, the teachings of the prior art, and the claim interpretation that would be given by one of skill in the art at the time the invention was made. *Id*. The test for definiteness is "**whether those skilled in the art would understand what is claimed** when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs*, Inc., 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). Further, **the claim as a whole must be considered**, "to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent." *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 USPQ2d 1279, 1283 (Fed. Cir. 2000).

The Office has not asserted, let alone established, why the claimed features are believed to be indefinite from the perspective of one of ordinary skill in the art. As such, the Office does not make a *prima facie* rejection of the claims. Further, Applicant respectfully submits that the claims are indeed definite at least because a person of ordinary skill in the art would readily recognize that Applicant is claiming **conditional logic**. For instance, Claim 1 includes conditional logic associated with two "if" statements. Each "if" statement is used to introduce conditional language that when true performs functional language.

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For instance, in the first "if" statement of claim 1, the conditional language of "the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell" is checked and when true, the functional language of "receiving control information associated with the downlink transmissions to the user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell" is performed. And, in the second "if" statement of claim 1, the conditional language of "the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell" is checked and when true, the functional language of "receiving control information associated with the downlink transmissions to the user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell" is performed. Hence, the claimed features of claim 1 include a **causal relationship** between the conditional language and the functional language of each "if" statement.

Furthermore, another claimed feature of claim 1 includes checking the conditional language of the first "if" statement **and** the conditional language of the second "if" statement. Hence, a person of ordinary skill in viewing claim 1 as a whole would understand what is claimed. Thus, claim 1 complies with the definiteness requirement. Accordingly, Applicant respectfully submits that claims 1-42 comply with the definiteness requirement, and requests that the rejection be withdrawn.

Claims 1-42 are rejected as being unpatentable over Nory in view of Marinier. For at least the reasons set forth in this Response, Applicant respectfully submits that Nory and Maranier fail to teach one or more of the claim elements of claims 1-42. Nory teaches that "if the UE is configured to receive PDSCH on a set of two component carriers, a first set of [bits] in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining [bits] can signal the resource block allocation for the second component carrier." Nory, para. [0036], lns. 9-14. Nory fails to teach using "a first set of radio resources on an uplink component carrier associated with the primary cell," "a second set of radio resources on the uplink component carrier associated with the primary cell," and "the second set of resources are additional resources as compared to the first set of resources," as claimed. In addition, the subject matter of Nory is directed to the downlink and NOT to the uplink. Further, Marinier is not relied on to disclose these deficiencies. Thus, the combination of Nory and

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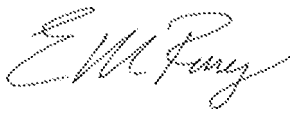
Marinier do not teach claim 1. Therefore, Applicant submits that claims 1-42 are allowable over Nory in view of Marinier.

Favorable consideration is respectfully and earnestly solicited.

Respectfully submitted,



Dated: March 6, 2015

Edward M. Roney
Registration No. 62,048
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Electronic Patent Application Fee Transmittal

Application Number:	12896993
Filing Date:	04-Oct-2010
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Filer:	Edward Milton Roney/Kenyatta Upchurch
Attorney Docket Number:	4015-6942 / P30138-US2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in Excess of 20	1202	2	80	160
Independent claims in excess of 3	1201	2	420	840
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
RCE- 2nd and Subsequent Request	1820	1	1700	1700
		Total in USD ($)		**2900**

Electronic Acknowledgement Receipt

EFS ID:	21694886
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	Edward Milton Roney/Kenyatta Upchurch
Filer Authorized By:	Edward Milton Roney
Attorney Docket Number:	4015-6942 / P30138-US2
Receipt Date:	06-MAR-2015
Filing Date:	04-OCT-2010
Time Stamp:	12:41:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$2900
RAM confirmation Number	21596
Deposit Account	
Authorized User	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	P30138_US2_RCE_Transmittal.pdf	697930 f29c05c69b82f40388cd2c61496513e03532126b	no	3
Warnings:					
Information:					
2		P30138_US2_Amendment_Accompanying_RCE.pdf	81668 48920b36c29533d21583f1a33ce35815d8ea9090	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	12
	Applicant Arguments/Remarks Made in an Amendment	13	15

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	35580 245ebfacb4b8bbe2b0428046fd92789c97b15baa	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	815178	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/896,993	Filing Date 10/04/2010	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **03/06/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 44	Minus	** 42	= 2	x $80 =	160
Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	x $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**160**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/ANDREA FREEMAN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942 / P30138-US2	1015

24112 7590 10/15/2015
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER
TALUKDER, MD K

ART UNIT	PAPER NUMBER
2648	

MAIL DATE	DELIVERY MODE
10/15/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 12/896,993	Applicant(s) ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03/06/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-44* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-44* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

2. It would be of great assistance to the office if all incoming papers pertaining to a filed application carried the following items:

i. Application number (checked for accuracy, including series code and serial no.).
ii. Group art unit number (copied from most recent Office communication).
iii. Filing date.
iv. Name of the examiner who prepared the most recent Office action.
v. Title of invention.
vi. Confirmation number (See MPEP § 503).

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/06/2015 has been entered.

4. The Examiner has pointed out particular references contained in the prior art of record within the body of this action for the convenience of the Applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages, paragraph and figures may apply. Applicant, in preparing the response, should consider fully the entire reference as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Claim Interpretation

5. Examiner read the functional language recited afterwards (after "IF") is optional step (broadest reasonable interpretation being applied). One of the "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional. All the independent claims having the same "If statement". For the purpose of expediting the processing of the application, Claims have been rejected in view of the prior art (see below) based on a broader interpretation that meets the claimed subject matter as interpreted by the Examiner.

Claim Rejection- 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained through the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nory (Pub No. 2010/0232373) and further in view of Marinier (Pub No. 2010/0322173).

Regarding claim 1, Nory teaches a method implemented by a base station of receiving control information from a user terminal (**Fig. 3 & 1: BS-101 receives control information from user terminals**), the method comprising: scheduling downlink transmissions to said user terminal on one or more downlink component carriers (scheduling- Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-**

frame n+1 to only schedule the single component carrier resource assignment…"); if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**), receiving control information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17) & (Para. 40-41, 44-47.** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 2, 10, Nory teaches that the control information to the user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink primary component carrier (abstract: "**…The transceiver is also configured to receive a second control message on the anchor carrier, the second control message associated with a set of component carriers, the set of component carriers are distinct from the anchor carrier. The controller determines a resource assignment for at least one component carrier in the set of component carriers using both the first and the second control messages**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 3, 11, Nory teaches transmitting control information to the user

terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 4, 12, Nory teaches at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier (**Fig. 3**).

Regarding claim 5, 13, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE)**

on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…").

Regarding claim 6, 14, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access. Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").**

Regarding claim 7, 15, Nory teaches transmitting an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink primary component carrier to the user terminal when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple**

component carriers") and (Para. **26, 36 & 40**).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 8, 16, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers**").

Regarding claim 9, Nory teaches a base station comprising: a transmitter to transmit user data on one or more downlink component carriers to a user terminal (**Fig. 1: transmission from BS-101 to remote unit-110**); and a controller to schedule downlink transmissions to said user

terminal, the downlink controller configured to schedule downlink transmissions to a user terminal on one or more downlink component carriers (scheduling- Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…");** if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**), receiving control information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17).** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 17, Nory teaches a user terminal of transmitting control information in a mobile communication network, the method comprising: receiving an assignment of radio resources for downlink transmissions from a base station (**Fig. 3 & 4 and Abstract: "A wireless communication terminal including a controller coupled to a wireless transceiver wherein the transceiver is configured to receive a first control message on an anchor carrier, the first control message including a resource assignment for the anchor carrier"**); transmitting on a first set of radio resources on an uplink component carrier, control information with the downlink transmission if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**) & (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB**

assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier), wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier **(Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17).** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 18, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para.

36: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Regarding claim 19, Claim 19 corresponds to claim 2 and is analyzed accordingly.

Regarding claim 20, Claim 20 corresponds to claim 3 and is analyzed accordingly.

Regarding claim 21, Claim 21 corresponds to claim 5 and is analyzed accordingly.

Regarding claim 22, Claim 22 corresponds to claim 6 and is analyzed accordingly.

Regarding claim 23, Claim 23 corresponds to claim 7 and is analyzed accordingly.

Regarding claim 24, Claim 24 corresponds to claim 8 and is analyzed accordingly.

Regarding claim 25 & 33 & 34, claim **25 & 33 & 34** corresponds to claim 17and/or 1, and is analyzed accordingly.

Regarding claim 26, Nory teaches transmitting user data on the second set of radio resources if a single downlink component carrier is assigned for the downlink transmission (Para. **36**: **"Alternately, if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier, UE can interpret that the Resource Block assignment bits are signaling a resource block assignment in groups of 4 resource blocks each"**).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 27, Nory teaches the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink primary component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining ten bits can signal the resource block allocation for the second component carrier…**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink

transmission system.

Regarding claim 28, Nory teaches the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources (**Fig. 3**).

Regarding claim 29, Nory teaches one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index (Para. 26: "**…Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted. When a PDSCH is also scheduled to the UE in the same sub-frame as the PDCCH-A, multiple ACK/NACKs (one each for PDCCH-A and the PDSCH) can be transmitted using multiple PUCCH resources…**").

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 30, Nory teaches the explicit indication is transmitted as radio resource control signaling (Para. 22: "**In first exemplary implementation, the base station configures**

UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor PDCCH messages from the anchor carrier after initial access. Before assigning resources on non-anchor component carriers via individual PDCCH in each component carrier, base unit sends a configuration message to the UE instructing the UE, the set of component carriers, whose PDCCH messages are also expected to be monitored…").

Regarding claim 31, Nory teaches the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink primary component carrier when the user terminal is scheduled to receive downlink transmissions on the second single downlink component carrier or multiple downlink component carriers (Para. 25: "**…The PDCCH-A can also include or indicate resources for acknowledging the transmission of the configuration message to increase reliability of signaling of the configuration message. Optionally, the base unit can also instruct the UE to send CQI for the set of component carriers identified in the long term bitmap by signaling a CQI-only uplink grant in the same sub-frame where PDCCH-A is transmitted. The configuration message can also optionally include a time offset limit before which UE should configure its receiver to monitor PDCCH messages from multiple component carriers**") and (Para. **26, 36 & 40**).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

At the time of the invention, it would have been obvious to one of the ordinary skilled in the art to use a primary cell in a downlink transmission process with resource allocation system for multiple component carriers for assigning resource blocks in uplink and downlink transmission system.

Regarding claim 32, Nory teaches the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources (Para. 27: "**In a third exemplary implementation, the base station configures UE via radio resource control (RRC) signaling with an anchor carrier. The UE is expected to only monitor the anchor carrier after initial access. Before assigning resources on component carriers other than the anchor carrier, base unit sends a configuration message to the UE, instructing it, the set of component carriers, where PDSCH resource allocations are expected. The configuration message allows the UE to semi-statically configure its receiver to receive PDSCH on the set of component carriers**").

Regarding Claims 35 to 42, The functional language recited afterwards (After "If") is optional. The "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional. Therefore, those claims do not have any patentable weight.

Regarding claim 43, Nory teaches a method implemented by a base station of receiving control information from a user terminal, the method comprising: scheduling downlink transmissions to said user terminal on one or more downlink component carriers; and receiving on a first set or a second set of resources on an uplink component carrier associated with a primary cell (**Fig. 3 & 1: BS-101 receives control information from user terminals**) including: scheduling downlink transmissions to said user terminal on one or more downlink component

carriers (scheduling- Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…");** if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**), receiving control information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17) & (Para. 40-41, 44-47.** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource blocks in uplink and downlink transmission system.

Regarding claim 44, Nory teaches a base station comprising: a transmitter to transmit user data on one or more downlink component carriers to a user terminal; and a controller to schedule downlink transmissions to said user terminal, the downlink controller configured to: schedule downlink transmissions to a user terminal on one or more downlink component carriers; and receiving on a first set or a second set of resources on an uplink component carrier associated with a primary cell (**Fig. 3 & 1: BS-101 receives control information from user terminals)** including: scheduling downlink transmissions to said user terminal on one or more downlink component carriers (scheduling- Para. 49: **"…If a sub frame n+1 with single component carrier allocation must follow a sub frame n with multi-component carrier allocation, both PDCCH-1 and PDCCH-2 can be transmitted in a sub-frame n+1 to only schedule the single component carrier resource assignment…");** if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier (Para. 17: **resource assignment for one component carrier**), receiving control information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is

reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17) & (Para. 40-41, 44-47.** (Note: The other part of "If statement" has no patentable weight because that is optional and the second "If statement" will never occur; according to the broadest reasonable interpretation by the examiner since it is optional).

Nory is silent regarding "the component carrier associated with a primary cell".

In a same field of endeavor, Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

Therefore, it would have been obvious to one of the ordinary skilled in the art to which this invention pertains at the time it was made to use a primary cell in a downlink transmission process of Marinier's disclosure with resource allocation system for multiple component carriers, as taught by Nory. Doing so would have resulted in efficiently using and assigning resource

blocks in uplink and downlink transmission system.

Response to Arguments

7. i. Applicant's arguments, with regards to claims have been fully considered but they are not persuasive.

ii. Applicant argument regarding "If" statement: Examiner fully consider the applicant arguments regarding "If" statement, however, they are not persuasive.

When there are multiple "If" statements in a claim, Examiner read one of the "If" statement is optional. If applicant want the examiner to consider all the limitation after "If" statement; then examiner would like to recommend the applicant to replace "If" with "When". Otherwise, examiner will maintain his interpretations (**broadest reasonable interpretation**) regarding claims.

iii. On Para 14-15, Applicant is arguing that prior art fails to teach "a first set of radio resources on an uplink component carrier associated with the primary cell".

Examiner respectfully disagrees with the applicant arguments because prior art either expressly or inherently teaches a first set of radio resources on an uplink component carrier associated with the primary cell. Nory teaches receiving control information on a first set of radio resources on an uplink component carrier, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on downlink component carrier (Para. 36: "**…if the UE is configured to receive PDSCH on a set of two component**

carrier, a first set of ten of the twenty bits in the RB assignment field can signal the resource block allocation for the first component carrier…if the UE is configured to receive PDSCH on only one component carrier then twenty eight bits can be used for RB assignment field to signal the resource block allocation for that single component carrier. In addition to this, if the UE is configured to receive PDSCH on only one component carrier) & (Para. 26: "Feedback transmission from the UE is possible on physical uplink control channel/physical uplink shared channel (PUCCH/PUSCH) of the anchor carrier. The PUCCH resource index implicitly assigned to the UE by the base station based on the lowest index of the Control Channel element (CCE) on which PDCCH-A is transmitted…") (also Para. 13-17) & (Para. 40-41, 44-47). Marinier teaches that the component carrier associated with the primary cell (Para. 16: **Down Link Component Carrier may include a primary serving cell).**

iv. According to KSR "Prior art is not limited just to the references being applied, but includes the understanding of one of ordinary skill in the art. The prior art reference (or references when combined) need not teach or suggest all the claim limitations, however, Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. **The "mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness." Dann v. Johnston, 425 U.S. 219, 230, 189 USPQ 257, 261 (1976).** The gap between the prior art and the claimed invention may not be "so great as to render the [claim] nonobvious to one reasonably skilled in the art." **In determining obviousness, neither the particular motivation to make the claimed invention nor the problem the inventor is solving controls**. The proper

analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a). **Factors other than the disclosures of the cited prior art may provide a basis for concluding that it would have been obvious to one of ordinary skill in the art to bridge the gap**." ***MPEP § 2141 (III)*** **RATIONALES TO SUPPORT REJECTIONS UNDER 35 U.S.C. 103 (emphasis added).**

v. Therefore, in view of above reasons, examiner maintains the rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MD TALUKDER whose telephone number is (571)270-3222. The examiner can normally be reached on Monday to Friday (Alt Friday off) from (9:30 to 4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wesley Kim can be reached on 571-272-7867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MD TALUKDER/
Examiner, Art Unit 2648

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
	Examiner MD TALUKDER	Art Unit 2648	Page 1 of 3

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*	C	US-2010/0098012 A1	04-2010	Bala; Erdem	H04L5/001	370/329
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	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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	O					
	P					
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	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 12/896,993	Applicant(s)/Patent Under Reexamination ASTELY ET AL.	
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	E	US-				
	F	US-				
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	**Art Unit**
	MD TALUKDER	2648

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012	06/27/2013	04/30/2014	11/18/2014	10/13/2015				
	1	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓				
	3	✓	✓	✓	✓	✓				
	4	✓	✓	✓	✓	✓				
	5	✓	✓	✓	✓	✓				
	6	✓	✓	✓	✓	✓				
	7	✓	✓	✓	✓	✓				
	8	✓	✓	✓	✓	✓				
	9	✓	✓	✓	✓	✓				
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	34	✓	✓	✓	✓	✓				
	35				✓	✓				
	36				✓	✓				

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CLAIM		DATE								
Final	Original	12/13/2012	06/27/2013	04/30/2014	11/18/2014	10/13/2015				
	37				✓	✓				
	38				✓	✓				
	39				✓	✓				
	40				✓	✓				
	41				✓	✓				
	42				✓	✓				
	43					✓				
	44					✓				

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	553	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in. and ericsson.as.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:05
L2	553	(((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.) and ericsson.as.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:05
L3	131	(((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.) and ericsson.as. and carrier adj aggregation	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:07
L4	48	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame)) and carrier adj aggregation	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:27
S1	1	"12896993"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 17:09
S2	367	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:04
S3	176	S2 and (radio near3 resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S4	28	S2 and (radio near3 resource) and (component with carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/10 19:09
S5	173	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04
S6	137	S5 and (scheduling)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:04

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S7	36	("20120263121" | "20110310856" | "20120127950" | "20110310819 " | "20120275395" | "20120287828" | "20120039291" | "20100271970" | "20120307781" | "20110286436" | "20120224535" | "20120140708" | "20110310820" | "20120163288" | "20110299486" | "20100098012" | "20120082125 " | "20120294273" | "20110268048" | "20120113910").pn.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 09:15
S8	127	(downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (carrier adj aggregation)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 10:16
S9	2	"20110292887"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:17
S11	25	((first 1st) adj6 component adj3 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:22
S12	1718	((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S13	66	(carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 11:47
S14	10842	455/509,522,456.6,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S15	28232	370/329,252,331.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:41
S16	102	(S14 S15) and (downlink near3 carrier) and (uplink near3 (primary first initial) near3 carrier) and ((second 2nd other next) with (channel resource)) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 13:42
S17	1	"13140333"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18
S18	2	"20110310856"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:18

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S19	38	((first 1st) adj6 component adj3 carrier) same ((radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S20	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:31
S21	27	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj4 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S22	38	(((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:32
S23	24	(carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 14:48
S24	8	("7551898" | "7649960" | "7656843" | "7773699").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:14
S25	2	"20110292900"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:36
S26	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:37
S27	3	"8050202"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:38
S28	1	"20120307689"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:45
S29	2	"8160017"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48
S30	2	"20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 15:48

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S31	2	"20090016278"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:16
S32	2	"8265030"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 17:19
S33	3	"2008139923"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2012/12/11 18:17
S34	14	("20100098012" | "20100232373" | "20110310856" | "20120020317" | "20120082125" | "20120140708" | "8265030").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:19
S35	7	"455"/$.ccls. and (carrier adj aggregation) and (schedul$3 near3 (downlink DL) with ((first primary initial) near6 (resource radio frequency frame)))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 17:22
S36	9	"455"/$.ccls. and (((first 1st) adj6 component adj3 carrier) same ((radio resource frame))) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/29 21:37
S38	4	("20070053294" | "20100290405").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S39	16	("7596114" | "20050013279" | "20030219028" | "20070217406" | "20020105970" | "20060050664" | "20090303938" | "20070064669").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/05/30 12:42
S40	290	(first 1st) with (component near2 carrier) with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:07
S41	114	(first 1st) with (component near2 carrier) with down$1link and receiv$3 near3 control near3 information	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 10:09
S42	47	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:29
S43	26	S42 and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:31

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S44	5	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) same (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:46
S45	26	(first 1st) near3 (radio adj resource) and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:47
S46	31	(second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:49
S47	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj aggregation) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:51
S48	0	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and (schedul$3 near3 (down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:52
S49	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:53
S50	1	@ad<"20091005" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component) and ((down$link DL reverse$1link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:55
S51	1	@ad<"20091003" and (second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 12:56
S52	20	(second other another 2nd) near3 (radio adj resource) and (carrier adj component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 13:31
S53	16	(set near3 radio near3 resource) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:14
S54	27	(set near3 ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:19
S55	755	(((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:25

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S56	70	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:26
S57	327	(((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 downlink reverse)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27
S58	29	((second 2nd other) with ((radio near3 resource) (resource adj block))) same component adj carrier and (schedul$3 near3 down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:27
S59	24	((second 2nd other) with ((radio near3 resource) (resource adj block))) same (component adj carrier) same (down$1link reverse$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:31
S60	10	("20090097447" | "20110081856" | "20090116427" | "20100232373" | "8331307").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 14:49
S61	2562	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:16
S62	739	(schedul$3 near3 downlink) and ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S63	259	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) and component adj carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:17
S64	39	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S65	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (component adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:18
S66	1	@ad<"20091005" and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20
S67	47	(schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 15:20

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S68	356	"455"/$.ccls. and ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:10
S70	19	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/17 17:17
S71	0	("2013/0107855").URPN.	USPAT	OR	ON	2013/06/18 09:15
S72	0	("2013/0107855").URPN.	US-PGPUB; USPAT	OR	ON	2013/06/18 09:16
S73	408	set near3 (radio frequency) near2 (resource band) same downlink and component	US-PGPUB; USPAT	OR	ON	2013/06/18 09:18
S74	17	set near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:19
S75	19	(set group Cluster) near3 (radio frequency) near2 (resource band) same downlink same (component adj carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 09:21
S76	12	("8457060" | "20110310819" | "20100271970" | "20130034073" | "20100098012" | "20110310856" | "20110317653" | "20130083742" | "20130083741" | "20120114021" | "20120275395" "20110317645" | "20110310856").p	US-PGPUB; USPAT	OR	ON	2013/06/18 09:31
S77	200	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:37
S78	2911	(UL up$link) with (set group) near6 (radio resource)	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S79	110	S77 and S78	US-PGPUB; USPAT	OR	ON	2013/06/18 10:38
S80	3	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (set group) near6 (radio resource) with (2nd second other another) near2 component	US-PGPUB; USPAT	OR	ON	2013/06/18 10:4
S81	28	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:17
S82	5	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (second 2nd) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 11:20
S83	4	(1st first first primary initia) near3 (set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:50
S84	3	(set group) near6 (radio resource) with (2nd second other another) near6 (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:52
S85	42	(set group) near6 (radio resource) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 13:58
S86	30	(set group) near3 ((radio resource)(resource near2 block)) with (DL down$link) near3 (component near3 carrier)	US-PGPUB; USPAT	OR	ON	2013/06/18 14:07

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S87	2	(second 2nd) near3 (down$1link DL) with ((component near3 carrier) CC) same (set group) with ((radio near2 resource) (resource near2 block))	US-PGPUB; USPAT	OR	ON	2013/06/18 14:14
S88	21	reserv$3 with component near3 carrier and (second near2 (radio frequency band))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/25 15:31
S89	36	"739528"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:34
S90	30	"5754138"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 09:35
S91	2046	(carrier near3 aggregation) and up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:24
S92	1052	(carrier near3 aggregation) and (component near3 carrier) same up$1link with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:26
S93	110	(carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 10:27
S95	17	("370"/$.ccls "455"/$.ccls.) and (aggregation) and (CC (component near3 carrier)) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:22
S96	67	370/329,341,348,395.4.ccls. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 15:26
S97	345368	schedule (DL (down adj link) down$1link) and (carrier near3 aggregation) and ((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:45
S98	9	schedule near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:46
S99	35	(schedule allocat$4) near3 (DL (down adj link) down$1link) and (carrier near3 aggregation) same((UL up$link) adj6 associat$4 near4 (DL down$link))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 16:48

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S100	0	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CCcomponent adj carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S101	216	(1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:14
S102	43	(1st first) near3 (radio band resource frequency) with (reserv$3 schedul$3 allocat$3) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/26 17:15
S103	22	("20100142455" | "20120009923" | "20100254329" | "20100091678" | "20110194501" | "20130010619" | "20080310359" | "20060274712" | "20100227569" | "20120208583" | "20110267978").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 09:57
S104	10	("20100254329" | "20100195624" | "20100023282" | "20090274100" | "20080316957").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2013/06/27 10:15
S105	50	("20100322173" | "20110081913" | "20130010721" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:25
S106	13348	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:40
S107	4330	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:42
S108	4200	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:43
S109	3823	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:44

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S110	6130	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:44
S111	370	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near3 carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:45
S112	365	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near3 carrier) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:46
S113	357	(S106 S107 S108 S109 S110) and (schedul$4 near3 down$1link) and (component near carrier) and (control with information)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:47
S114	13	(S106 S107 S108 S109 S110) and (DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (component near3 carrier)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 13:47
S115	40	(H03F3/211, H04B7/0617, H04B7/0669, H04B1/3833, H04M1/0247, H04M1/0237, H04L29/08657, G01S5/0252, G01S5/02, H04W52/367, H04W52/12, H04W52/40, H04W88/08, H04W72/044, H04W72/042).cpc. and (carrier near3 aggregation) and (component near3 carrier) same up$1link with associat$3 with down$1link	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/22 14:17
S116	8750	(H04W88/08, H04W72/044, H04W72/042l).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:21
S117	4336	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:22
S118	4205	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:23
S119	4144	(H04L29/08657, G01S19/14, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:23
S120	3826	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 14:24
S121	47	(H04W88/08, H04W72/044, H04W72/042).cpc. and (1st first) near3 (radio band resource	US-PGPUB; USPAT;	OR	ON	2014/04/26 14:27

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		frequency) with (1st first) near3 (CC (component adj carrier))	USOCR; DERWENT; IBM_TDB			
S122	25	(S116 S117 S118 S119 S120).cpc. and (1st first) near3 (radio band resource frequency) with (1st first) near3 (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/26 15:35
S123	13432	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S124	4341	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S125	4208	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S126	3833	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S127	6154	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S128	98	(S123 S124 S125 S126 S127) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S129	52	(S123 S124 S125 S126 S127) and (schedul$4 near3 down$1link) and (component near3 carrier) and single near6 carrier same (plurality multiple several) near3 (DL down$1link) with carrier	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:04
S130	4	(S123 S124 S125 S126 S127) and (schedul$4) with component near3 carrier and (single near3 (DL down$1link)) with (first with resource) and (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:37
S131	2	(up$1link UL) and (schedul$4) with component near3 carrier same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:40
S132	2	(schedul$4) with component near3 carrier same (single near3 (DL down$1link)) with (first with resource) same (multiple plurality several) near3 (DL downlink) with second with resource	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:42
S133	2	(schedul$4) same (single near3 (DL down$1link)) with (first with resource) same	US-PGPUB; USPAT;	OR	ON	2014/04/30 11:44

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		(multiple plurality several) near3 (DL downlink) with second with resource	USOCR; DERWENT; IBM_TDB			
S134	2	(schedul$4) same (single near3 (DL down$1link)) with (first with (frequency resource block)) same (multiple plurality several) near3 (DL downlink) with second with (frequency block resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:45
S135	16	(single near3 (DL down$1link)) with (first with (frequency resource block)) same (multiple plurality several) near3 (DL downlink) with second with (frequency block resource)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 11:45
S136	1	allocation with (PUSCH PUCCH UL (up$1link)) and "20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:19
S137	1	allocation and (PUSCH PUCCH UL (up$1link)) and "20100232373"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:21
S138	2	"20100271970"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/04/30 14:32
S139	54	("20100322173" | "20110081913" | "20130010721" | "8634358" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20110243039" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 11:49
S140	15049	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S141	4737	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S142	4341	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S143	4030	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT;	OR	ON	2014/10/15 13:44

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			USOCR; DERWENT; IBM_TDB			
S144	6785	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S145	96	(S140 S141 S142 S143 S144) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier same (frequency resources)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:44
S146	1	"13315135"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 13:54
S147	2	"20080151845"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 14:58
S148	41	"455"/$.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 15:45
S149	3	"455"/451,452.1.ccls. and (carrier near3 aggregation) and ((first 1st) adj6 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/15 18:01
S150	33889	455/451,452.1,509,456.1,522,137,103,575.ccls.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:25
S151	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (sererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:32
S152	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (rererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:33
S153	4	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (reserv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:34
S154	3	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel Bin) same (reserv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin) and (CC component)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 11:37
S155	4	"455"/$.ccls. and (((first 1st) adj6 component adj3 carrier) same ((radio resource frame)))	US-PGPUB; USPAT;	OR	ON	2014/10/23 11:39

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		and ((2nd second) adj6 component adj3 carrier) same ((2nd second other another) adj6 (radio resource frame)) and (reserv$4 sav$4 us$3) near3 (other 2nd second another) adj3 (resource frequency channel Bin) and (CC component)	USOCR; DERWENT; IBM_TDB			
S156	15	("20050013279" | "20030219028" | "20070217406" | "20020105970" | "20060050664" | "20090303938" | "20070064669").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 12:07
S157	10	"455"/$.ccls. and (schedul$3 near3 downlink) same ((radio adj resource) (resource adj block)) same (CC (component adj carrier))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/23 12:07
S158	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel) same (rererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 15:22
S161	15374	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S162	4758	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S163	4377	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S164	4042	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S165	6867	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/10/31 17:18
S167	1	"14170939"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/17 09:46
S168	499	(component near2 carrier) with (primary near2 cell)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:07
S169	401	"370"/$.ccls. and (component near2 carrier) with (primary near2 cell)	US-PGPUB; USPAT; USOCR; DERWENT;	OR	ON	2014/11/18 14:07

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			IBM_TDB			
S170	378	"370"/$.ccls. and (component adj2 carrier) with (primary adj2 cell)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:07
S171	185	"370"/$.ccls. and (component adj2 carrier) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:08
S172	4	"370"/$.ccls. and single near3 (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:17
S173	4	single near4 (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:19
S174	287	"370"/$.ccls. and (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:21
S175	1	@ad<"20091004" and "370"/$.ccls. and (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:22
S176	287	"370"/$.ccls. and (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2014/11/18 14:22
S177	29	("20100322173" | "20110081913" | "20130010721" | "8634358" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20110243039" | "8792830" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20020160784" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/01 11:34
S178	21250	(H04W88/08, H04W72/044, H04W72/042).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:24
S179	5857	(H04W52/367, H04W52/12, H04W52/40).cpc.	US-PGPUB; USPAT; USOCR;	OR	ON	2015/10/01 17:24

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			DERWENT; IBM_TDB			
S180	5079	(H04L29/08657, G01S5/0252, G01S5/02).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:24
S181	4391	(H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:24
S182	8620	(H03F3/211, H04B7/0617, H04B7/0669).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:24
S183	221	(S178 S179 S180 S181 S182) and (schedul$4 near3 down$1link) and (component near3 carrier) and single with carrier same (plurality multiple several) with (DL down$1link) with carrier same (frequency)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:24
S184	552	((david near2 astely) (robert near2 baldemair) (dirk near2 gerstenberger) (daniel near2 larsson) (lars near2 lindbom) (stefan near2 parkvall)).in. and ericsson.as.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:56
S185	1	S183 and S184	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 17:56
S186	21	455/$.ccls. and ((first 1st) adj6 component adj3 carrier) same ((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/01 18:11
S187	24	("20100322173" | "20110081913" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20110243039" | "8792830" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20020160784" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT	OR	OFF	2015/10/02 12:23
S188	1	"14030298"	US-PGPUB; USPAT	OR	OFF	2015/10/02 15:41
S189	198	((1st first) adj6 (radio resource frame)) and ((2nd second) adj6 component adj3 carrier) same ((2nd second) adj6 (radio resource frame))	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/03 16:15
S190	1	"14102508"	US-PGPUB; USPAT;	OR	ON	2015/10/13 14:17

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			USOCR; DERWENT; IBM_TDB			
S191	0	"14158378"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:17
S192	1	"14097736"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:17
S193	2	"14006545"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:17
S194	1	"13875620"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:18
S195	1	"13905342"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:18
S196	1	"13477988"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:18
S197	2	"13293245"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:18
S198	1	"13875620"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:19
S199	2	"13993807"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:19
S200	1	"13898465"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:19
S201	1	"13883792"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:19
S202	1	"13996405"	US-PGPUB; USPAT;	OR	ON	2015/10/13 14:19

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			USOCR; DERWENT; IBM_TDB			
S203	1	"13883002"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:20
S204	0	"14812058"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:20
S205	7	"8915660"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:20
S206	1	"13909538"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:21
S207	1	"13924238"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:22
S208	1	"13898465"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:23
S209	2	"13993807"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:23
S210	58	("20100322173" | "20110081913" | "20130010721" | "8634358" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20110243039" | "8792830" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20020160784" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:25
S211	1	"13906370"	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:38
S212	58	("20100322173" | "20110081913" |	US-PGPUB;	OR	ON	2015/10/13

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		"20130010721" | "8634358" | "20120140708" | "20100271970" | "20100285809" | "20110007699" | "20130003700" | "20100232373" | "20120051306" | "20120082125" | "20100098012" | "20100003997" | "20100208679" | "20110310856" | "20120082125" | "20120140708" | "20130136084" | "8265030" | "20110243039" | "8792830" | "20120020317" | "8265030" | "20110007695" | "20110081932" | "20120314675" | "20020160784" | "20110310856" | "20100232373" | "20100296389" | "20120020317" | "20100098012" | "20130034073" | "8447343" | "8472368").PN.	USPAT; USOCR; DERWENT; IBM_TDB			14:51
S213	0	(H04W88/08, H04W72/044, H04W72/042).cpc. and (H04W52/367, H04W52/12, H04W52/40).cpc. and (H04L29/08657, G01S5/0252, G01S5/02).cpc. and (H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:55
S214	36289	(H04W88/08, H04W72/044, H04W72/042, H04W52/367, H04W52/12, H04W52/40, H04L29/08657, G01S5/0252, G01S5/02, H04B1/3833, H04M1/0247, H04M1/0237).cpc.	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:56
S215	3	(H04W88/08, H04W72/044, H04W72/042, H04W52/367, H04W52/12, H04W52/40, H04L29/08657, G01S5/0252, G01S5/02, H04B1/3833, H04M1/0247, H04M1/0237).cpc. and single near3 (CC (component adj2 carrier)) with (primary adj2 cell) with (DL down$1link)	US-PGPUB; USPAT; USOCR; DERWENT; IBM_TDB	OR	ON	2015/10/13 14:56

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S159	0	455/451,452.1,509,456.1,522,137,103,575.ccls. and (control$4) with (resource frequency channel) same (rererv$4 sav$4) near3 (other 2nd second another) adj3 (resource frequency channel Bin)	US-PGPUB; USPAT; * No UPAD	OR	ON	2014/10/31 15:24
S160	5	(DL down$link) with (1st first first primary initia) near3 (set group) near6 (radio resource) and (DL down$link) with (set group) near6 (radio resource) with (2nd second other another) near2 component	US-PGPUB; USPAT; * No UPAD	OR	ON	2014/10/31 15:26

10/13/2015 5:34:12 PM
C:\Users\mtalukder\Documents\EAST\Workspaces\12896993.wsp

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12896993	ASTELY ET AL.
	Examiner	Art Unit
	MD TALUKDER	2648

CPC- SEARCHED

Symbol	Date	Examiner
H04W88/08, H04W72/044, H04W72/042	4/22/2014 & 4/30/2014 & 10/31/2014	
H04W52/367, H04W52/12, H04W52/40	4/22/2014 & 4/30/2014 & 10/31/2014	Talukder
H04L29/08657, G01S5/0252, G01S5/02	4/22/2014 & 4/30/2014 & 10/31/2014	Talukder
H04B1/3833, H04M1/0247, H04M1/0237	4/22/2014 & 4/30/2014	Talukder
H03F3/211, H04B7/0617, H04B7/0669	4/22/2014 & 4/30/2014	
H04W88/08, H04W72/044, H04W72/042, H04W52/367, H04W52/12, H04W52/40, H04L29/08657, G01S5/0252, G01S5/02, H04B1/3833, H04M1/0247, H04M1/0237	10/13/2015	Talukder

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
455	509,522,456.6,137,103,575	12/11/2012	
370	329,252,331	12/11/2012	Talukder
455	Text	6/17/2013	
370	329,341,348,395.4	6/26/2013	
455	All	10/13/2015	Talukder

SEARCH NOTES

Search Notes	Date	Examiner

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SEARCH NOTES		
Search Notes	**Date**	**Examiner**
East Search	12/10/2012	talukder
East Search	12/11/2012	talukder
East Search	6/17/2013	talukder
East Search	6/18/2013	talukder
East Search	6/26/2013	talukder
East Search	6/27/2013	
East Search	4/22/2014 & 4/30/2014	
Text Srarched	10/31/2014	Talukder
Assignee Searched	10/13/2015	Talukder
Inventor Searched	10/13/2015	Talukder
East Searched	10/13/2015	Talukder

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**

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UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942 / P30138-US2	1015

24112 7590 02/01/2016
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER
TALUKDER, MD K

ART UNIT	PAPER NUMBER
2648	

MAIL DATE	DELIVERY MODE
02/01/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	12/896,993	ASTELY ET AL.	
	Examiner	Art Unit	
	MD TALUKDER	2648	

All participants (applicant, applicant's representative, PTO personnel):

(1) *MD TALUKDER.* (3)____.

(2) *Edward Roney.* (4)____.

Date of Interview: *26 January 2016.*

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: ____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: ____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

During the interview claim 1 was discussed in view of the oustanding rejection. Examiner further clarified his position of the pending rejection in the interview while no agreement was reached with respect to allowability..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/MD TALUKDER/ Examiner, Art Unit 2648	

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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **David Astely et al.**	
Serial No.: **12/896,993**	Examiner: Md K. Talukder
Filed: **October 4, 2010**	Group Art Unit: 2648
For: **PUCCH Resource Allocation for Carrier Aggregation for LTE-Advanced**	Confirmation No.: 1015
Docket No: **4015-6942 / P30138-US2**	

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NON-FINAL OFFICE ACTION

This paper is being filed in response to the Non-Final Office Action mailed October 15, 2016. Reconsideration is respectfully requested in light of the amendments and/or remarks below. The Office is hereby authorized to charge any fees required for entry of this paper to Deposit Account 18-1167.

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AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method implemented by a base station of receiving control information from a user terminal, the method comprising:

scheduling downlink transmissions to **a first**~~said~~ user terminal **on a single downlink component carrier associated with a primary cell and a second user terminal on multiple downlink component carriers including the single downlink component carrier associated with the primary cell**~~on one or more downlink component carriers~~;

~~if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell,~~ receiving control information associated with the downlink transmissions to the **first** user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

~~if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell,~~ receiving control information associated with the downlink transmissions to the **second** user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

2. (Currently amended) The method of claim 1 further comprising transmitting control information to the **first** user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink component carrier associated with the primary cell.

3. (Currently amended) The method of claim **1[[2]]** further comprising transmitting control information to the **second** user terminal on a downlink component carrier to implicitly or explicitly indicate the second set radio resources on the uplink component carrier associated with the primary cell.

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4. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated implicitly by at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

5. (Original) The method of claim 3 wherein at least one of the first and second sets of radio resources are indicated explicitly by an uplink control channel index.

6. (Original) The method of claim 5 wherein the explicit indication is transmitted as radio resource control signaling.

7. (Currently amended) The method of claim 1 further comprising transmitting an acknowledgement resource indication on the single downlink component carrier associated with the primary cell to dynamically assign said second set of radio resources on the uplink component carrier associated with the primary cell to the **second** user terminal when the **second** user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

8. (Original) The method of claim 7 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

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9. (Currently amended) A base station comprising:

a transmitter to transmit user data on one or more downlink component carriers to a **first** user terminal **and a second user terminal**; and

a controller to schedule downlink transmissions to **the first** ~~said~~ user terminal **and the second user terminal**, the ~~downlink~~ controller configured to:

schedule downlink transmissions to **the first[[a]]** user terminal **on a single downlink component carrier associated with a primary cell and the second user terminal on multiple downlink component carriers including the single downlink component carrier associated with the primary cell** ~~on one or more downlink component carriers~~;

~~if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell,~~ receive control information associated with the downlink transmissions to the **first** user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

~~if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell,~~ receive control information associated with the downlink transmissions to the **second** user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

10. (Currently amended) The base station of claim 9 wherein the controller is further configured to transmit control information to the **first** user terminal on a downlink component carrier to implicitly or explicitly indicate the first set of radio resources on the uplink component carrier associated with the primary cell.

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11. (Currently amended) The base station of claim **9[[10]]** wherein the controller is further configured to transmit control information to the **second** user terminal on a downlink component carrier to implicitly or explicitly indicate the second set of radio resources on the uplink component carrier associated with the primary cell.

12. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources implicitly by sending at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier.

13. (Original) The base station of claim 11 wherein the controller is further configured to indicate at least one of the first and second sets of radio resources explicitly by sending an uplink control channel index.

14. (Original) The base station of claim 13 wherein the controller is further configured to send the explicit indication as radio resource control signaling.

15. (Currently amended) The base station of claim 9 wherein the controller is further configured to transmit an acknowledgement resource indication on a downlink component carrier to dynamically assign said second set of radio resources on the uplink component carrier associated with the primary cell to the **second** user terminal when the **second** user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

16. (Original) The base station of claim 15 wherein the acknowledgement resource indication selects the second set of resources from a semi-static set of uplink resources.

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17. (Currently amended) A method implemented by a user terminal of transmitting control information in a mobile communication network, the method comprising:

receiving an assignment of radio resources for downlink transmissions from a base station;

transmitting, on a first set of radio resources on an uplink component carrier associated with a primary cell, control information associated with the downlink transmissions **[[if]]responsive to receiving** an assignment of a single downlink component carrier associated with the primary cell ~~**is received**~~ for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

transmitting, on a second set of radio resources on the uplink component carrier associated with the primary cell, control information associated with the downlink transmissions **[[if]]responsive to receiving** an assignment of multiple downlink component carriers including the single downlink component carrier associated with the primary cell for the downlink transmission ~~**is received**~~, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

18. (Previously presented) The method of claim 17 further comprising transmitting user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

19. (Previously presented) The method of claim 17 further comprising receiving control information from the base station on a downlink component carrier implicitly or explicitly indicating the second set of radio resources on the uplink component carrier associated with the primary cell.

20. (Previously presented) The method of claim 19 wherein receiving control information comprises receiving at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying said second set of resources.

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21. (Original) The method of claim 19 wherein receiving control information comprises receiving an uplink control channel index explicitly identifying said second set of resources.

22. (Original) The method of claim 21 wherein the explicit indication is received as radio resource control signaling.

23. (Previously presented) The method of claim 17, further comprising receiving, from a base station, an acknowledgement resource indication on the single downlink component carrier associated with the primary cell to dynamically assign said second set of radio resources on the uplink component carrier associated with the primary cell when the user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

24. (Original) The method of claim 23 further comprising selecting the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

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25. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with the downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink component carrier associated with a primary cell **[[if]]responsive to receiving** an assignment of a single downlink component carrier associated with the primary cell ~~**is received**~~ for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

select a second set of radio resources on the uplink component carrier associated with the primary cell **[[if]]responsive to receiving** an assignment of multiple downlink component carriers including the single downlink component carrier associated with the primary cell for the downlink transmission ~~**is received**~~, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

26. (Previously presented) The user terminal of claim 25 configured to transmit user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

27. (Previously presented) The user terminal of claim 25 wherein the controller is further configured to receive control information from the base station on a downlink component carrier implicitly or explicitly identifying the second set of radio resources on the uplink component carrier associated with the primary cell.

28. (Original) The user terminal of claim 27 wherein the controller is further configured to receive at least one of a downlink control channel index, number of downlink component carriers, and user terminal identifier implicitly identifying the second set of radio resources.

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29. (Previously presented) The user terminal of claim 27 wherein the controller is further configured to receive an uplink control channel index explicitly identifying the second set of radio resources on the uplink component carrier associated with the primary cell.

30. (Original) The user terminal of claim 29 wherein the controller is further configured to receive the explicit indication as radio resource control signaling.

31. (Previously presented) The user terminal of claim 25 wherein the controller is further configured to receive, from a base station, an acknowledgement resource indication on a downlink component carrier dynamically assigning said second set of radio resources on the uplink component carrier associated with the primary cell when the user terminal is scheduled to receive downlink transmissions on the multiple downlink component carriers.

32. (Original) The user terminal of claim 31 wherein the controller is configured to select the second set of resources from a semi-static set of uplink resources responsive to the acknowledgement resource indication.

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33. (Currently amended) A method implemented by a user terminal in a mobile communication network, the method comprising:

receiving an assignment of radio resources for a downlink transmissions from a base station;

transmitting control information associated with the downlink transmission on a first set of radio resources on an uplink component carrier associated with a primary cell **[[if]]responsive to receiving** an assignment of a first downlink component carrier associated with the primary cell ~~**is received**~~ for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier associated with the primary cell; and

transmitting control information associated with the downlink transmission on a second set of radio resources on the uplink component carrier associated with the primary cell **[[if]]responsive to receiving** an assignment of the first downlink component carrier associated with the primary cell and a second single downlink component carrier associated with a non-primary cell for the downlink transmission ~~**is received**~~, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier and the second single downlink component carrier and the second set of resources are additional resources as compared to the first set of resources.

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34. (Currently amended) A user terminal for mobile communications, the user terminal comprising:

a receiver to receive downlink transmissions from a base station;

a transmitter to transmit control information associated with the downlink transmission to a base station; and

a controller to select radio resources for transmission of control information associated with downlink transmissions, the controller configured to:

select a first set of radio resources on an uplink component carrier associated with a primary cell **[[if]]responsive to receiving** an assignment of a first downlink component carrier associated with the primary cell ~~**is received**~~ for the downlink transmission, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier associated with the primary cell; and

select a second set of radio resources on the uplink component carrier associated with the primary cell **[[if]]responsive to receiving** an assignment of the first downlink component carrier associated with the primary cell and a second single downlink component carrier associated with a non-primary cell for the downlink transmission ~~**is received**~~, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the first downlink component carrier and the second single downlink component carrier and the second set of resources are additional resources as compared to the first set of resources.

35. (Previously presented) The method of claim 1, further comprising:

receiving user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

36. (Previously presented) The method of claim 1, further comprising:

receiving control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

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37. (Previously presented) The base station of claim 9, further configured to:
receive user data on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

38. (Previously presented) The base station of claim 9, further configured to:
receive control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

39. (Previously presented) The method of claim 17, further comprising:
transmitting control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

40. (Previously presented) The user terminal of claim 25, further configured to:
transmit control signaling on the second set of radio resources if a single downlink component carrier associated with a non-primary cell is assigned for the downlink transmission.

41. (Currently amended) The method of claim 1, further comprising:
if the **first** user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier associated with a non-primary cell, receiving control information associated with the downlink transmissions to the **first** user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second single downlink component carrier.

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42. (Currently amended) The base station of claim 9, further configured to:

if the **first** user terminal is scheduled to receive downlink transmissions on a second single downlink component carrier associated with a non-primary cell, receive control information associated with the downlink transmissions to the **first** user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the second single downlink component carrier.

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43. (Currently amended) A method implemented by a base station of receiving control information from a **first** user terminal **and a second user terminal**, the method comprising:

scheduling downlink transmissions to **the first**~~said~~ user terminal **on a single downlink component carrier associated with a primary cell and the second user terminal on multiple downlink component carriers including the single downlink component carrier associated with the primary cell**~~on one or more downlink component carriers~~; and

receiving on a first set or a second set of resources on an uplink component carrier associated with a primary cell, including:

~~if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with a primary cell,~~ receiving control information associated with the downlink transmissions to the **first** user terminal on the first set of radio resources on the uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

~~if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell,~~ receiving control information associated with the downlink transmissions to the **second** user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

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44. (Currently amended) A base station comprising:

a transmitter to transmit user data on one or more downlink component carriers to a **first** user terminal **and a second user terminal**; and

a controller to schedule downlink transmissions to **the first** ~~said~~ user terminal **and the second user terminal**, the ~~downlink~~ controller configured to:

schedule downlink transmissions to **the first[[a]]** user terminal **on a single downlink component carrier associated with the primary cell and the second user terminal on multiple downlink component carriers including the single downlink component carrier associated with the primary cell** ~~on one or more downlink component carriers~~; and

receiving on a first set or a second set of resources on an uplink component carrier associated with a primary cell, including:

~~if the user terminal is scheduled to receive downlink transmissions on a single downlink component carrier associated with the primary cell,~~ receive control information associated with the downlink transmissions to the **first** user terminal on the first set of radio resources on the uplink component carrier associated with the primary cell, wherein the first set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the single downlink component carrier associated with the primary cell; and

~~if the user terminal is scheduled to receive downlink transmissions on multiple downlink component carriers including the single downlink component carrier associated with the primary cell,~~ receive control information associated with the downlink transmissions to the **second** user terminal on the second set of radio resources on the uplink component carrier associated with the primary cell, wherein the second set of radio resources is reserved for user terminals scheduled to receive downlink transmissions on the multiple downlink component carriers and the second set of resources are additional resources as compared to the first set of resources.

45. (New) The method of claim 1, wherein the first user equipment is the same as the second user equipment.

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46. (New) The method of claim 1, wherein the first user equipment is different from the second user equipment.

47. (New) The base station of claim 9, wherein the first user equipment is the same as the second user equipment.

48. (New) The base station of claim 9, wherein the first user equipment is different from the second user equipment.

49. (New) The method of claim 43, wherein the first user equipment is the same as the second user equipment.

50. (New) The method of claim 43, wherein the first user equipment is different from the second user equipment.

51. (New) The base station of claim 44, wherein the first user equipment is the same as the second user equipment.

52. (New) The base station of claim 44, wherein the first user equipment is different from the second user equipment.

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REMARKS

After entry of this Response, Claims 1-44 are pending. Claims 1-3, 7, 9-11, 15, 17, 25, 33-34 and 41-44 are amended. Claims 45-52 are newly added. No new matter is introduced by the present Response.

THE EXAMINER INTERVIEW

Pursuant to the provisions of 37 C.F.R. § 1.133(b), Applicant wishes to make of record the substance of an interview between Applicant's undersigned representative, Edward M. Roney of Coats & Bennett PLLC, and Examiner MD K Talukder conducted telephonically on January 26, 2016. In the interview, the attendees discussed differences between the cited art and the claimed invention but no agreement was reached.

THE OBVIOUSNESS REJECTION

Without limiting the claims, the present application relates to assigning either a first set of resources on an uplink component carrier for a single downlink component carrier or a second set of resources on multiple downlink component carriers that includes the single downlink component carrier.

Independent claims 1, 9, 43 and 44 are rejected as being obvious over Nory (US 2010/232,373) and Marinier (2010/322,173). Applicant respectfully submits that Nory and Maranier fail to teach one or more of the claim elements of amended independent claims 1, 9, 43 and 44. For instance, amended claim 1 is allowable at least because Nory and Maranier fail to teach the claim limitations of "scheduling downlink transmissions to a first user terminal on a single downlink component carrier associated with a primary cell and a second user terminal on multiple downlink component carriers including the single downlink component carrier associated with the primary cell," "receiving control information associated with the downlink transmissions to the first user terminal on a first set of radio resources on an uplink component carrier associated with the primary cell," "receiving control information associated with the downlink transmissions to the second user terminal on a second set of radio resources on the uplink component carrier associated with the primary cell," and "the second set of resources are additional resources as compared to the first set of resources."

Nory teaches that "if the UE is configured to receive PDSCH on a set of two component carriers, a first set of [bits] in the RB assignment field can signal the resource block allocation for the first component carrier and the remaining [bits] can signal the resource block allocation for

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the second component carrier." Nory, para. [0036], lns. 9-14. However, Nory fails to teach using "a first set of radio resources on an uplink component carrier associated with the primary cell," "a second set of radio resources on the uplink component carrier associated with the primary cell," and "the second set of resources are additional resources as compared to the first set of resources," as claimed. In addition, the subject matter of Nory is directed to the downlink and NOT to the uplink.

These deficiencies of Nory are not cured by Marinier. In fact, the Office does not rely on Marinier to disclose these limitations. Thus, the combination of Nory and Marinier fails to teach amended claim 1. Therefore, for at least the reasons given in this Response, Applicant submits that amended independent claims 1, 9, 43 and 44 are allowable over Nory in view of Marinier.

Independent claims 17, 25, 33 and 34 are rejected as being obvious over Nory and Marinier. Applicant respectfully submits that Nory and Maranier fail to teach one or more of the claim elements of amended claims 17, 25, 33 and 34. For instance, amended claim 17 is allowable at least because Nory and Maranier fail to teach the claim limitations of "transmitting, on a first set of radio resources on an uplink component carrier associated with a primary cell, control information associated with the downlink transmissions responsive to receiving an assignment of a single downlink component carrier associated with the primary cell for the downlink transmission," "transmitting, on a second set of radio resources on the uplink component carrier associated with the primary cell, control information associated with the downlink transmissions responsive to receiving an assignment of multiple downlink component carriers including the single downlink component carrier associated with the primary cell for the downlink transmission," and "the second set of resources are additional resources as compared to the first set of resources."

Similar to the aforementioned arguments, Nory fails to teach using "a first set of radio resources on an uplink component carrier associated with the primary cell," "a second set of radio resources on the uplink component carrier associated with the primary cell," and "the second set of resources are additional resources as compared to the first set of resources," as claimed. In addition, the subject matter of Nory is directed to the downlink and NOT the uplink. Further, Marinier is not relied on to disclose these limitations. Thus, the combination of Nory and Marinier fails to teach amended claim 17. Therefore, for at least the reasons given in this Response, Applicant submits that amended independent claims 17, 25, 33 and 34 are allowable over Nory in view of Marinier.

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The remaining dependent claims are also allowable at least due to their dependence on an allowable independent claim.

Favorable consideration is respectfully and earnestly solicited.

Respectfully submitted,

Dated: February 12, 2016

/Edward M. Roney/
Edward M. Roney
Registration No. 62,048
Phone: 919.719.4870

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PTO/SB/08a (03-15)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12896993
Filing Date	2010-10-04
First Named Inventor	David Astely et al.
Art Unit	2648
Examiner Name	Md K. Talukder
Attorney Docket Number	4015-6942 / P30138-US2

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12896993
	Filing Date	2010-10-04
	First Named Inventor	David Astely et al.
	Art Unit	2648
	Examiner Name	Md K. Talukder
	Attorney Docket Number	4015-6942 / P30138-US2

	1	NTT DOCOMO, Inc., "UL Layered Control Signal Structure in LTE-Advanced", 3GPP DRAFT RAN WG1 Meeting #54bis; RI-083679 UL LAYERED CONTROL SIGNAL, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. Ran WG1, no. Prague, Czech Republic; 20080929-20081003, 29 September 2008 (2008-09-29), XP050597042, [retrieved on 2008-09-24]

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Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12896993
	Filing Date	2010-10-04
	First Named Inventor	David Astely et al.
	Art Unit	2648
	Examiner Name	Md K. Talukder
	Attorney Docket Number	4015-6942 / P30138-US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Edward M. Roney, Reg. No. 62048/	Date (YYYY-MM-DD)	2016-02-12
Name/Print	Edward M. Roney	Registration Number	62048

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **Astely** *et al.*	)	
	)	
Serial No.: **12/896,993**	)	
	)	Examiner: Md K. Talukder
Filed: **October 4, 2010**	)	
	)	Group Art Unit: 2648
For: **PUCCH Resource Allocation for Carrier Aggregation for LTE-Advanced**	)	Confirmation No.: 1015
	)	
Attorney's Docket No: **4015-6942 / P30138-US2**	)	
	)	

MS AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

In accordance with 37 C.F.R. 1.56, counsel wishes to make of record the attached items of information for the Examiner's consideration in connection with this application. Also attached is Form PTO/SB/08A for the Examiner's convenience in making such consideration of record. Inclusion herein of any particular item of information is not to be construed as an admission that same is prior art. Each item of information contained in the information disclosure statement:

☐ was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by an individual designated in §1.56(c) more than thirty days prior to the filing of the information disclosure statement; or

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☒ No statement re Patent Term Adjustment (PTA).

The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to Deposit Account 18-1167.

Respectfully submitted,
COATS & BENNETT, P.L.L.C.

/ Edward M. Roney /
Edward M. Roney
Registration No.: 62,048
Telephone: (919) 854-1844

Dated: February 12, 2016

Electronic Patent Application Fee Transmittal

Application Number:	12896993
Filing Date:	04-Oct-2010
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Filer:	Edward Milton Roney/Robert Sivigny
Attorney Docket Number:	4015-6942 / P30138-US2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in Excess of 20	1202	8	80	640
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
			Total in USD ($)	**840**

Electronic Acknowledgement Receipt

EFS ID:	24898101
Application Number:	12896993
International Application Number:	
Confirmation Number:	1015
Title of Invention:	PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced
First Named Inventor/Applicant Name:	David Astely
Customer Number:	24112
Filer:	Edward Milton Roney/Robert Sivigny
Filer Authorized By:	Edward Milton Roney
Attorney Docket Number:	4015-6942 / P30138-US2
Receipt Date:	12-FEB-2016
Filing Date:	04-OCT-2010
Time Stamp:	10:31:19
Application Type:	Utility under 35 USC 111(a)

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Payment was successfully received in RAM	$840
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1		4015-6942_Response.pdf	94149 c641d1c27e3944510414377a5be59a9f184beb44	yes	19
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	16	
	Applicant Arguments/Remarks Made in an Amendment		17	19	
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	4015-6942_IDS.pdf	1035428 dfa33b1b8646a5ef46ffe6640eb87a728c2a10e9	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
3	Transmittal Letter	4015-6942_IDS_Cover.pdf	91703 2cfbb4da64b189d60f408c0a36c0a9d5a7259f02	no	1
Warnings:					
Information:					
4	Non Patent Literature	R1-083679.pdf	7013378 2717af15354f688c866b9389e048dc9e46417dc	no	14
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	32401 2bd78d1c178a416a3fbfdd6ee8f62fe83bb605c0	no	2
Warnings:					

Information:	
Total Files Size (in bytes):	8267059

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/896,993	Filing Date 10/04/2010	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **02/12/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 52	Minus	** 44	= 8	x $80 =	640
Independent (37 CFR 1.16(h))	* 8	Minus	***8	= 0	x $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**640**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/ROCHELLE GETER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

24112 7590 03/18/2016
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER	
TALUKDER, MD K	
ART UNIT	PAPER NUMBER
2648	

DATE MAILED: 03/18/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942 / P30138-US2	1015

TITLE OF INVENTION: PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/20/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24112 7590 03/18/2016
COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942 / P30138-US2	1015

TITLE OF INVENTION: PUCCH Resource Allocation for Carrier Aggregation in LTE-Advanced

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/20/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
TALUKDER, MD K	2648	455-509000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/896,993	10/04/2010	David Astely	4015-6942 / P30138-US2	1015

24112 7590 03/18/2016

COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER	
TALUKDER, MD K	

ART UNIT	PAPER NUMBER
2648	

DATE MAILED: 03/18/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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Apple EX1005 Page 407

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.