

EXHIBIT B-2

Summary of Invalidity Analysis of U.S. Patent No. 10,181,931 in view of U.S. Patent Application Publication No. 2014/0219202 to Kim et al. (“Kim”)

U.S. Patent Application Publication No. 2014/0219202 to Kim et al. (“Kim”), was published on August 7, 2014 and claims priority earlier applications including provisional application No. 61/527,128 (“128 Application”) and PCT Application KR 2012/006493 (“PCT 493”). By way of example only, at least the following disclosures of the 128 Application and PCT 493 support claim 1 of Kim. *See, e.g.*, 128 Application at page 14 of 22, 16 of 22, 19 of 22, 21 of 22, and PCT 493 at Abstract, (57), [94]-[110], [115]. By way of example only, at least the following disclosures of the 2013 Application are sufficient to support Claim 1 of Lee. *See, e.g.*, 2013 Application at Therefore, Kim qualifies as prior art to the ’931 Patent under at least 35 U.S.C. § 102(a). As described in the following claim chart, at least under Pegasus’s apparent infringement theory, the asserted claims of the ’931 Patent are invalid as expressly and/or inherently anticipated by Kim.

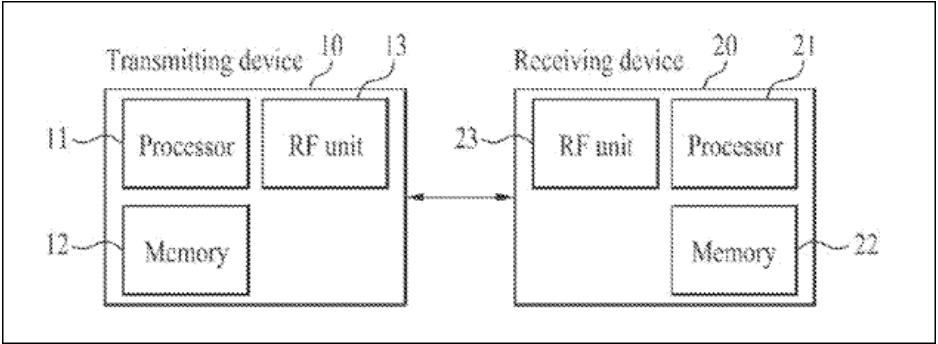
To the extent that Kim is found not to anticipate, expressly or inherently, one or more of the asserted claims of the ’931 Patent, at least under Pegasus’s apparent infringement theory, these claims are invalid as obvious in view of Kim in view of the background knowledge and ordinary creativity of a person having ordinary skill in the art at the time of the alleged invention, or in combination with other prior art identified in the cover pleading, herein, or as disclosed in Defendants’ Invalidity Contentions and accompanying charts and appendices. A person of ordinary skill would have been motivated to combine Kim and any other prior art references, including but not limited to the other prior art identified in the cover pleading or herein, with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

Defendants reserve the right to amend or supplement this invalidity chart at a later date.

1. Claim 1

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Claim Language		Exemplary Citations to Kim
1[pre]	A method of transmitting response information of downlink data of a Machine Type Communication (MTC) terminal, the method comprising:	To the extent the preamble is limiting, at least under Pegasus's apparent infringement theory, Kim discloses a method for transmitting response information of downlink data of a Machine Type Communication (MTC) terminal. For example, Kim discloses this limitation based on the following exemplary citations: In the present invention, a physical uplink control channel (PUCCH) resource, which is used for transmitting acknowledgement/negative ACK (ACK/NACK) information related to downlink control information, is determined on the basis of $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$, when the format of the downlink control information that is transmitted/received through a physical downlink control channel (PDCCH) is in accordance with a transmission mode of a user equipment, wherein $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value which is received from the base station, n_{CCE} is a first control channel element (CCE) index in the PDCCH, X is a parameter which is not the n_{CCE} and the $N^{(1)}_{PUCCH}$, and wherein f is a function having the n_{CCE}, $N^{(1)}_{PUCCH}$, and the X as a factor. Kim at Abstract. With appearance and spread of machine-to-machine (M2M) communication and a variety of devices such as smartphones and tablet PCs and technology demanding a large amount of data transmission, data throughput needed in a cellular network has rapidly increased. To satisfy such rapidly increasing data throughput, carrier aggregation technology, cognitive radio technology, etc. for efficiently employing more frequency bands and multiple input multiple output (MIMO) technology, multi-eNB cooperation technology, etc. for raising data capacity transmitted on limited frequency resources have been developed. In addition, a communication environment has evolved into increasing density of nodes accessible by a user equipment (UE) at the periphery of the nodes. A node refers to a fixed point capable of transmitting/receiving a radio signal to/from a UE through one or more antennas. A communication system including high-

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		density nodes may provide a better communication service to the UE through cooperation between the nodes. Kim at Para. [0002]. Due to introduction of new radio communication technology, the number of user equipments (UEs) to which an eNB should provide a service in a prescribed resource region increases and the amount of uplink data and uplink control information that the BS should receive from the UEs increases. Since the amount of resources available to the BS for communication with the UE(s) is finite, a new method in which the BS efficiently receives uplink data and/or uplink control information using the finite radio resources is needed. Kim at Para. [0007]. As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$” where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0010]. As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a

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		plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. FIG. 12 is a block diagram illustrating elements of a transmitting device 10 and a receiving device 20 for implementing the present invention. Kim at Para. [0038].  Kim at FIG. 12.

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		FIG. 7 illustrates an example of determining a dynamic PUCCH resource according to an embodiment of the present invention. Kim at Para. [0033]. The diagram illustrates the mapping of CCEs to PUCCH resources. At the top, a sequence of CCEs is shown with indices n-1, n, n+1, n+2, and n+3. CCE n is expanded to show its internal structure: PDCCH(L=2), DCI format A (labeled as Fallback DCI), and DCI format B (labeled as TM dependent DCI). Below this, two PUCCH resources are shown: PUCCH resource A and PUCCH resource B. PUCCH resource A contains subcarriers m-1, m, m+1, m+2, and m+3. PUCCH resource B contains subcarriers m+K-1, m+K, m+K+1, m+K+2, and m+K+3. A dashed arrow labeled 'n-to-m linkage (CCE-to-AN)' connects CCE n to subcarrier m in PUCCH resource A. Another dashed arrow labeled 'n-to-\'m+K\' linkage (CCE-to-AN)' connects CCE n to subcarrier m+K in PUCCH resource B. A label 'K=offset value' points to the subcarrier m+K in PUCCH resource B. Kim at FIG. 7. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 19 of 22, PCT 493 supports these disclosures. <i>See</i> PCT 493 at Fig. 12, Fig. 1, [2], [61].

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		To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[a]	receiving structural information that contains at least one of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel;	At least under Pegasus's apparent infringement theory, Kim discloses receiving structural information that contains at least one of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on "[Equation 1] $n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$" where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010].

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		As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. In each aspect of the present invention, the information indicating the specific parameter set may correspond to n bits added to a downlink control information (DCI) format. Kim at Para. [0020]. The control information transmitted through the PDCCH will be referred to as downlink control information (DCI). The DCI includes resource allocation information for a UE or UE group and other control information. For example, the DCI includes transport format and resource allocation information of a downlink shared channel (DL-SCH), transport format and resource allocation information of an uplink shared channel (UL-SCH), paging information on a paging channel (PCH), system information on the DL-SCH, resource allocation information of upper layer control message such as random access response transmitted on the PDSCH, a set of transmit power control commands of individual UEs within a UE group, transmit power control information, and activity

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		information of voice over Internet protocol (VoIP). The size and usage of the DCI carried by one PDCCH are varied depending on DCI formats. The size of the DCI may be varied depending on a coding rate. In the current 3GPP LTE system, various formats are defined, wherein format 0 is defined for UL, and formats 1, 1A, 1B, 1C, 1D, 2, 2A, 3, and 3A are defined for DL. Combination selected from control information such as a hopping flag, RB allocation, modulation coding scheme (MCS), redundancy version (RV), new data indicator (NDI), transmit power control (TPC), cyclic shift, cyclic shift demodulation reference signal (DMRS), UL index, channel quality information (CQI) request, DL assignment index, HARQ process number, transmitted precoding matrix indicator (TPMI), precoding matrix indicator (PMI) information is transmitted to the UE as the DCI. Table 3 illustrates an example of the DCI format. Kim at Para. [0059]. The eNB may transmit data to a UE or UE group in the data region. Data transmitted in the data region is referred to as user data. A PDSCH may be allocated to the data region for user data transmission. The PCH and the DL-SCH are transmitted on the PDSCH. A UE may decode control information received on a PDCCH and thus read data received on the PDSCH. The size and usage of DCI transmitted on one PDCCH may vary according to DCI format and the size of the DCI may vary according to coding rate. Information indicating to which UE or UE group PDSCH data is transmitted and information indicating how the UE or UE group should receive and decode the PDSCH data are transmitted on the PDCCH. For example, it is assumed that a specific PDCCH is CRC-masked with a radio network temporary identity (RNTI) 'A' and information about data transmitted using a radio resource 'B' (e.g. frequency location) and using transport format information 'C' (e.g. transmission block size, modulation scheme, coding information, etc.) is transmitted in a specific DL subframe. Then, the UE monitors the PDCCH using RNTI information thereof. The UE having the RNTI 'A' receives the PDCCH and receives the PDSCH indicated by 'B' and 'C' through information of the received PDCCH. Kim at Para. [0069].

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		Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098].

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		The diagram illustrates the mapping of CCEs to PUCCH resources. At the top, a horizontal sequence of boxes represents CCEs with indices n-1, n, n+1, n+2, and n+3. An arrow labeled 'One CCE' points to box n, and another labeled 'CCE index' points to the index n. Below this sequence, a vertical stack of boxes represents PUCCH resources: PDCCH(L=2), DCI format A (labeled 'Fallback DCI'), and DCI format B (labeled 'TM dependent DCI'). Two dashed arrows, both labeled 'n-to-m linkage (dynamic CCE-to-AN mapping)', originate from the bottom of the DCI format B box and point to a horizontal sequence of boxes at the bottom representing PUCCH resources with indices m-1, m, m+1, m+2, and m+3. An arrow labeled 'PUCCH resource index' points to the index m. Ellipses (...) are used at both ends of the CCE and PUCCH sequences to indicate they are not limited to the shown indices. Kim at FIG. 6. In FIG. 10, a value indicating a relative location calculated based on N(1) PUCCH indicating the start location of dynamic PUCCH resources of a specific cell (cell of RX point 1) is used as an offset value (K or L) indicating the start location of dynamic PUCCH resources configured per RX point according to the present invention. However, a value indicating an absolute start location rather than a relative value based on N(1) PUCCH of a specific cell may be used as the offset value indicating the start location of separately configured dynamic PUCCH resources according to the present invention. Kim at Para. [0164].

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		The diagram illustrates the mapping of a Control Channel Element (CCE) to an Antenna Port (AN) via Physical Downlink Control Channels (PDCCHs). At the top, a sequence of CCEs is shown with indices $n-1$, n, $n+1$, $n+2$, and $n+3$. CCE n is specifically labeled as 'One CCE' and its index is 'CCE index'. Below this, a vertical stack represents the PDCCH structure: PDCCH(L=2), DCI format A (labeled as 'Fallback DCI'), DCI format B (labeled as 'TM dependent DCI'), and DCI format C (labeled as 'TM dependent DCI'). Two linkages are shown: an 'n-to-$m+L$ linkage (CCE-to-AN)' and an 'n-to-$m+K$ linkage (CCE-to-AN)'. These linkages connect CCE n to specific subcarriers in three different PUCCH resources (A, B, and C) at different RX points. PUCCH resource A (RX point 1) has subcarriers $m-1$ to $m+3$. PUCCH resource B (RX point 2) has subcarriers $m+K-1$ to $m+K+3$. PUCCH resource C (RX point 3) has subcarriers $m+L-1$ to $m+L+3$. The offset values K and L are indicated as 'K or L=offset value'. Kim at FIG. 10. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 13-14 of 22, page 12 of 22, page 19 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [55]-[56], [70], [94]-[103]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate

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		this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[b]	receiving downlink control information for scheduling the downlink data;	At least under Pegasus's apparent infringement theory, Kim discloses receiving downlink control information for scheduling the downlink data. For example, Kim discloses this limitation based on the following exemplary citations: As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on "[Equation 1] $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$" where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0010]. As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a

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		specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. In the present invention, a physical downlink control channel (PDCCH), a physical control format indicator channel (PCFICH), a physical hybrid automatic retransmit request indicator channel (PHICH), and a physical downlink shared channel (PDSCH) refer to a set of time-frequency resources or Resource Elements (REs) carrying downlink control information (DCI), a set of time-frequency resources or REs carrying a control format indicator (CFI), a set of time-frequency resources or REs carrying downlink acknowledgement (ACK)/negative ACK (NACK), and a set of time-frequency resources or REs carrying downlink data, respectively. In addition, a physical uplink control channel (PUCCH) and a physical uplink shared channel (PUSCH) refer to a set of time-frequency resources or REs carrying uplink control information (UCI) and a set of time-frequency resources or REs uplink data, respectively. In the present invention, in particular, a time-frequency resource or RE that is assigned to or belongs to PDCCH/PCFICH/PHICH/PDSCH/PUCCH/PUSCH/PRACH is referred to as PDCCH/PCFICH/PHICH/PDSCH/PUCCH/PUSCH/PRACH RE or PDCCH/PCFICH/PHICH/PDSCH/PUCCH/PUSCH/PRACH time-frequency resource, respectively. Therefore, in the present invention, PUCCH/PUSCH transmission of a UE is conceptually identical to UCI/uplink data/random access signal transmission on

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		PUSCH/PUCCH, respectively. In addition, PDCCH/PCFICH/PHICH/PDSCH transmission of an eNB is conceptually identical to downlink data/DCI transmission on PDCCH/PCFICH/PHICH/PDSCH, respectively. Kim at Para. [0046]. Transmission and reception of the PDCCH will be described in more detail. The eNB generates control information in accordance with the DCI format. The eNB may select one of a plurality of DCI formats (DCI formats 1, 2, . . . , N) in accordance with control information to be transmitted to the UE. The eNB attaches cyclic redundancy check (CRC) for error detection to the control information generated in accordance with each DCI format. The CRC is masked with an identifier (for example, radio network temporary identifier (RNTI)) depending on owner or usage of the PDCCH. In other words, the PDCCH is CRC scrambled with the identifier (for example, RNTI). If the C-RNTI is used, the PDCCH carries the control information for the corresponding specific UE. If the other RNTI (for example, P-RNTI, SI-RNTI, RA-RNTI) is used, the PDCCH carries common control information received by all the UEs within the cell. The eNB generates coded data by performing channel coding for CRC added control information. The eNB performs rate matching based on the CCE aggregation level allocated to the DCI format, and generates modulation symbols by modulating the coded data. The modulation symbols constituting one PDCCH may have a CCE aggregation level of one of 1, 2, 4, and 8. The modulation symbols are mapped into physical resource elements (CCE to RE mapping). The UE performs demapping of physical resource elements into CCEs (CCE to RE demapping). Since the UE does not know what CCE aggregation level should be used to receive the PDCCH, the UE performs demodulation for each CCE aggregation level. The UE performs rate dematching for the demodulated data. Since the UE does not know what DCI format (or DCI payload size) of control information should be received therein, the UE performs rate dematching for each of DCI formats (or DCI payload size) of a corresponding transmission mode. The UE performs channel decoding for the rate dematched data in accordance with a code rate, and detects whether an error has occurred, by checking CRC. If an error has not occurred, the UE may be determined that the UE will detect its PDCCH. If the error has

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		occurred, the UE continues to perform blind decoding for the other CCE aggregation level or the other DCI format (or DCI payload size). The UE that has detected its PDCCH removes CRC from the decoded data and acquires control information. Kim at Para. [0068]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097].

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		Kim at FIG. 6. Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 (L=2) on CCEs n and n+1. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format

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		A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098]. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 14-15 of 22, Fig. 2-(a). PCT 493 supports these disclosures. <i>See</i> PCT 493 at [111], [110], [188], Fig. 9. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[c]	receiving the downlink data; and	At least under Pegasus's apparent infringement theory, Kim discloses receiving the downlink data. For example, Kim discloses this limitation based on the following exemplary citations: In the meantime, in order to maintain operation load based on blind decoding at a certain level or less, not all the DCI formats are searched at the same time. For example, the UE is configured semi-statically by upper layer signaling to receive PDSCH data

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signaled through the PDCCH in accordance with one of transmission modes 1 to 9. Table 6 illustrates a transmission mode for configuring multi-antenna technology and a DCI format where the UE performs blind decoding in accordance with the corresponding transmission mode. Kim at Para. [0066].

TABLE 6			
Transmission mode	DCI format	Search Space	Transmission scheme of PDSCH corresponding to PDCCH
Mode 1	DCI format 1A	Common and UE specific by C-RNTI	Single-antenna port, port 0
	DCI format 1	UE specific by C-RNTI	Single-antenna port, port 0
Mode 2	DCI format 1A	Common and UE specific by C-RNTI	Transmit diversity
	DCI format 1	UE specific by C-RNTI	Transmit diversity
Mode 3	DCI format 1A	Common and UE specific by C-RNTI	Transmit diversity
	DCI format 2A	UE specific by C-RNTI	Large delay CDD or Transmit diversity
Mode 4	DCI format 1A	Common and UE specific by C-RNTI	Transmit diversity
	DCI format 2	UE specific by C-RNTI	Closed-loop spatial multiplexing or Transmit diversity
Mode 5	DCI format 1A	Common and UE specific by C-RNTI	Transmit diversity
	DCI format 1D	UE specific by C-RNTI	Multi-user MIMO
Mode 6	DCI format 1A	Common and UE specific by C-RNTI	Transmit diversity
	DCI format 1B	UE specific by C-RNTI	Closed-loop spatial multiplexing using a single transmission layer
Mode 7	DCI format 1A	Common and UE specific by C-RNTI	If the number of PBCH antenna ports is one, Single-antenna port, port 0 is used, otherwise Transmit diversity
	DCI format 1	UE specific by C-RNTI	Single-antenna port, port 5
Mode 8	DCI format 1A	Common and UE specific by C-RNTI	If the number of PBCH antenna ports is one, Single-antenna port, port 0 is used, otherwise Transmit diversity
	DCI format 2B	UE specific by C-RNTI	Dual layer transmission, port 7 and 8 or single-antenna port, port 7 or 8
Mode 9	DCI format 1A	Common and UE specific by C-RNTI	Non-MBSFN subframe: If the number of PBCH antenna ports is one, Single-antenna port, port 0 is used, otherwise Transmit diversity. MBSFN subframe: Single-antenna port, port 7
	DCI format 2C	UE specific by C-RNTI	Up to 8 layer transmission, ports 7-14

Kim at Table 6.

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		As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$” where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010]. As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment

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		through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. The control information transmitted through the PDCCH will be referred to as downlink control information (DCI). The DCI includes resource allocation information for a UE or UE group and other control information. For example, the DCI includes transport format and resource allocation information of a downlink shared channel (DL-SCH), transport format and resource allocation information of an uplink shared channel (UL-SCH), paging information on a paging channel (PCH), system information on the DL-SCH, resource allocation information of upper layer control message such as random access response transmitted on the PDSCH, a set of transmit power control commands of individual UEs within a UE group, transmit power control information, and activity information of voice over Internet protocol (VoIP). The size and usage of the DCI carried by one PDCCH are varied depending on DCI formats. The size of the DCI may be varied depending on a coding rate. In the current 3GPP LTE system, various formats are defined, wherein format 0 is defined for UL, and formats 1, 1A, 1B, 1C, 1D, 2, 2A, 3, and 3A are defined for DL. Combination selected from control information such as a hopping flag, RB allocation, modulation coding scheme (MCS), redundancy version (RV), new data indicator (NDI), transmit power control (TPC), cyclic shift, cyclic shift demodulation reference signal (DMRS), UL index, channel quality information (CQI) request, DL assignment index, HARQ process number, transmitted precoding matrix indicator (TPMI), precoding matrix indicator (PMI) information is transmitted to the UE as the DCI. Table 3 illustrates an example of the DCI format. Kim at Para. [0059]. Transmission and reception of the PDCCH will be described in more detail. The eNB generates control information in accordance with the DCI format. The eNB may select one of a plurality of DCI formats (DCI formats 1, 2, . . . , N) in accordance with control information to be transmitted to the UE. The eNB attaches cyclic redundancy check (CRC) for error detection to the control information generated in accordance with each

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		DCI format. The CRC is masked with an identifier (for example, radio network temporary identifier (RNTI)) depending on owner or usage of the PDCCH. In other words, the PDCCH is CRC scrambled with the identifier (for example, RNTI). If the C-RNTI is used, the PDCCH carries the control information for the corresponding specific UE. If the other RNTI (for example, P-RNTI, SI-RNTI, RA-RNTI) is used, the PDCCH carries common control information received by all the UEs within the cell. The eNB generates coded data by performing channel coding for CRC added control information. The eNB performs rate matching based on the CCE aggregation level allocated to the DCI format, and generates modulation symbols by modulating the coded data. The modulation symbols constituting one PDCCH may have a CCE aggregation level of one of 1, 2, 4, and 8. The modulation symbols are mapped into physical resource elements (CCE to RE mapping). The UE performs demapping of physical resource elements into CCEs (CCE to RE demapping). Since the UE does not know what CCE aggregation level should be used to receive the PDCCH, the UE performs demodulation for each CCE aggregation level. The UE performs rate dematching for the demodulated data. Since the UE does not know what DCI format (or DCI payload size) of control information should be received therein, the UE performs rate dematching for each of DCI formats (or DCI payload size) of a corresponding transmission mode. The UE performs channel decoding for the rate dematched data in accordance with a code rate, and detects whether an error has occurred, by checking CRC. If an error has not occurred, the UE may be determined that the UE will detect its PDCCH. If the error has occurred, the UE continues to perform blind decoding for the other CCE aggregation level or the other DCI format (or DCI payload size). The UE that has detected its PDCCH removes CRC from the decoded data and acquires control information. Kim at Para. [0068]. The eNB may transmit data to a UE or UE group in the data region. Data transmitted in the data region is referred to as user data. A PDSCH may be allocated to the data region for user data transmission. The PCH and the DL-SCH are transmitted on the PDSCH. A UE may decode control information received on a PDCCH and thus read data received on the PDSCH. The size and usage of DCI transmitted on one PDCCH may vary

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		according to DCI format and the size of the DCI may vary according to coding rate. Information indicating to which UE or UE group PDSCH data is transmitted and information indicating how the UE or UE group should receive and decode the PDSCH data are transmitted on the PDCCH. For example, it is assumed that a specific PDCCH is CRC-masked with a radio network temporary identity (RNTI) 'A' and information about data transmitted using a radio resource 'B' (e.g. frequency location) and using transport format information 'C' (e.g. transmission block size, modulation scheme, coding information, etc.) is transmitted in a specific DL subframe. Then, the UE monitors the PDCCH using RNTI information thereof. The UE having the RNTI 'A' receives the PDCCH and receives the PDSCH indicated by 'B' and 'C' through information of the received PDCCH. Kim at Para. [0069]. Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098].

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		One CCE CCE index ... n-1 n n+1 n+2 n+3 ... PDCCH(L=2) DCI format A Fallback DCI DCI format B TM dependent DCI n-to-m linkage (dynamic CCE-to-AN mapping) n-to-m linkage (dynamic CCE-to-AN mapping) PUCCH resource index ... m-1 m m+1 m+2 m+3 ... Kim at FIG. 6. The embodiment of the present invention may be applied to carrier aggregation. Carrier aggregation (CA) (or bandwidth aggregation) refers to a technology that uses a wider UL/DL bandwidth by aggregating a plurality of UL/DL frequency blocks in order to use a wider frequency bandwidth than a frequency bandwidth operating on one carrier. A general wireless communication system transmits/receives data through one DL band and through one UL band corresponding to the DL band (in the case of frequency division duplex (FDD) mode) or transmits/receives data through a UL/DL time unit (in the case of time division duplex (TDD) mode) by dividing a prescribed radio frame into the UL time unit and the DL time unit in the time domain. An eNB and a UE transmit and receive data and/or control information scheduled on a prescribed time unit basis, i.e. on a subframe basis. In this way, CA is a technology that uses a wider UL/DL

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		bandwidth by aggregating a plurality of UL/DL frequency blocks in order to use a wider frequency bandwidth, whereas a single carrier technology uses one DL band and one UL band corresponding to the DL band for communication. The CA technology is different from OFDM technology for performing DL or UL communication by carrying a base frequency band, divided into a plurality of orthogonal subcarriers, on one carrier frequency, in that DL and/or UL communication is performed using a plurality of carrier frequencies. Each of plural aggregated carriers is referred to as a component carrier (CC). CCs may be contiguous or non-contiguous in the frequency domain and the bandwidth of each CC may be independently determined. Asymmetrical CA in which the number of UL CCs is different from the number of DL CCs may be configured. Here, a UL CC and a DL CC may also be referred to as UL resources and DL resources, respectively. Kim at Para. [0110]. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 21 of 22, 18 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [17], [71], Fig. 1. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[d]	transmitting the response information on the downlink data	At least under Pegasus's apparent infringement theory, Kim discloses transmitting the response information on the downlink data by using the resource allocated to the uplink

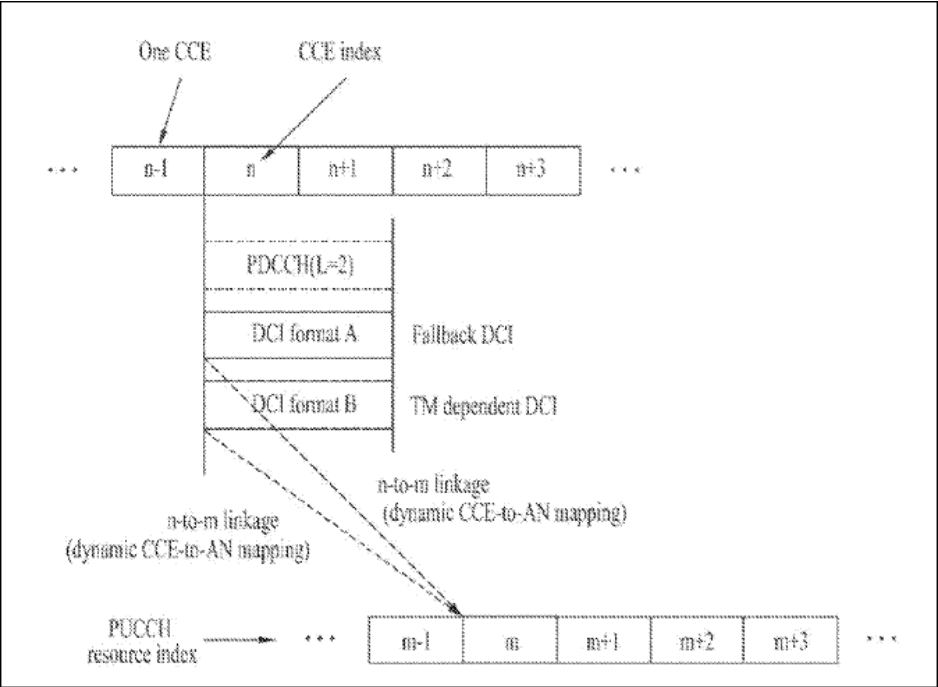
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	by using the resource allocated to the uplink control channel,	control channel. For example, Kim discloses this limitation based on the following exemplary citations: As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$” where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0010]. In each aspect of the present invention, information indicating the transmission mode may be further transmitted to the user equipment from the base station. Kim at Para. [0014]. In each aspect of the present invention, when the format of the downlink control information is a second format rather than the first format, the ACK/NACK information may be transmitted to the base station from the user equipment using at least one of a PUCCH resource determined based on “[Equation 2] $n^{(1)}_{PUCCH} = n_{CCE} + N^{(1)}_{PUCCH}$” and a PUCCH resource determined based on “[Equation 3] $n^{(1)}_{PUCCH} = n_{CCE} + 1 + N^{(1)}_{PUCCH}$”. Kim at Para. [0015]. As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless

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		communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. The PUCCH may be used to transmit the following control information. Scheduling request (SR): SR is information used to request a UL-SCH resource and is transmitted using an on-off keying (OOK) scheme. HARQ-ACK: HARQ-ACK is a response to a PDCCH and/or a response to a DL data packet (e.g. a codeword) on a PDSCH. HARQ-ACK indicates whether the PDCCH or PDSCH has been successfully received. 1-bit HARQ-ACK is transmitted in response to a single DL codeword and 2-bit HARQ-ACK is transmitted in response to two DL codewords. A HARQ-ACK response includes a positive ACK (simply, ACK), negative ACK (NACK), discontinuous transmission (DTX), or NACK/DRX. HARQ-ACK is used interchangeably with HARQ ACK/NACK and ACK/NACK. Channel state information (CSI): CSI is feedback information for a DL channel. MIMO-related feedback information includes a rank indicator (RI) and a precoding matrix indicator (PMI). Kim at Paras. [0078]-[0081].

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		PUCCH resources are configured based on a cell ID. A UE acquires an ID of a cell accessed thereby and configures PUCCH resources for PUCCH transmission in the cell, that is, PUCCH transmission to a node of the cell, based on the cell ID. The PUCCH resources configured based on one cell ID include PUCCH resources for transmission of CSI, PUCCH resources for transmission of semi-persistent scheduling (SPS) ACK/NACK and SR, and PUCCH resources for transmission of dynamic ACK/NACK (i.e. dynamically allocated PUCCH resources linked with a PDCCH). In a 3GPP LTE/LTE-A system, PUCCH resources for transmission of CSI, SPS ACK/NACK, SR, etc. are semi-statically reserved explicitly for the UE by a higher-layer signal. Hereinafter, for ACK/NACK transmission, a PUCCH resource dynamically determined in association with a PDCCH is especially referred to as a dynamic PUCCH resource or an implicit PUCCH resource, and a PUCCH resource explicitly configured by a higher-layer signal is referred to as a semi-static PUCCH resource or an explicit PUCCH resource. In addition, a PUCCH resource for CSI transmission is referred to as a CSI PUCCH resource or a CSI resource, a PUCCH resource for SPS ACK/NACK transmission is referred to as an SPS ACK/NACK PUCCH resource or an SPS ACK/NACK resource, a PUCCH resource for SR transmission is referred to as an SR PUCCH resource or an SR resource, and a PUCCH resource for ACK/NACK transmission associated with a PDCCH is referred to as an ACK/NACK PUCCH resource or an ACK/NACK resource. Kim at Para. [0092]. Referring to Equation 2, PUCCH resources for ACK/NACK are not pre-allocated to each UE and a plurality of UEs in a cell dividedly uses a plurality of PUCCH resources at each time point. Specifically, PUCCH resources used by the UE to carry ACK/NACK are dynamically determined based on a PDCCH carrying scheduling information for a PDSCH carrying corresponding DL data. An entire region in which the PDCCH is transmitted in each DL subframe includes a plurality of CCEs and the PDCCH transmitted to the UE is composed of one or more CCEs. The UE transmits

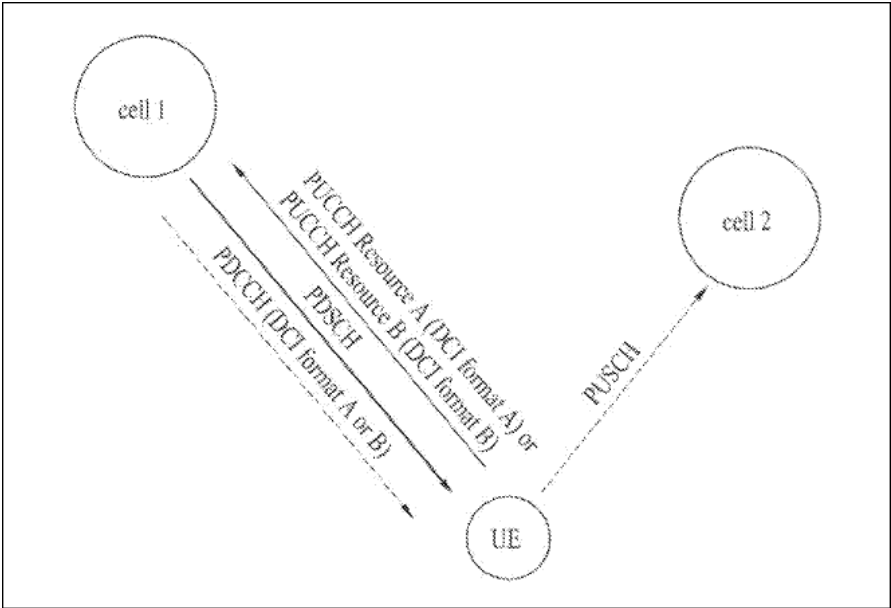
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		ACK/NACK through a PUCCH resource linked to a specific CCE (e.g. first CCE) among the CCEs constituting the PDCCH received thereby. Kim at Para. [0094]. $m = \begin{cases} N_{RB}^{(2)} & \text{if } n_{PUCCH}^{(1,p)} < c \cdot N_{cs}^{(1)} / \Delta_{shift}^{PUCCH} \\ \left\lceil \frac{n_{PUCCH}^{(1,p)} - c \cdot N_{cs}^{(1)} / \Delta_{shift}^{PUCCH}}{c \cdot N_{sc}^{RB} / \Delta_{shift}^{PUCCH}} \right\rceil + N_{RB}^{(2)} + \left\lceil \frac{N_{cs}^{(1)}}{8} \right\rceil & \text{otherwise} \end{cases} \quad \text{[Equation 2]}$ $c = \begin{cases} 3 & \text{normal cyclic prefix} \\ 2 & \text{extended cyclic prefix} \end{cases}$ Kim at Equation 2. In Equation 2, $n_{PUCCH}^{(1,p)}$ denotes a PUCCH resource index of an antenna port p for PUCCH format 1/1a/1b. In the case of an ACK/NACK PUCCH, $n_{PUCCH}^{(1,p)}$ is a value implicitly determined by the first CCE index of a PDCCH carrying scheduling information of a corresponding PDSCH. Kim at Para. [0088]. Referring to Equation 2, PUCCH resources for ACK/NACK are not pre-allocated to each UE and a plurality of UEs in a cell dividedly uses a plurality of PUCCH resources at each time point. Specifically, PUCCH resources used by the UE to carry ACK/NACK are dynamically determined based on a PDCCH carrying scheduling information for a PDSCH carrying corresponding DL data. An entire region in which the PDCCH is transmitted in each DL subframe includes a plurality of CCEs and the PDCCH transmitted to the UE is composed of one or more CCEs. The UE transmits ACK/NACK through a PUCCH resource linked to a specific CCE (e.g. first CCE) among the CCEs constituting the PDCCH received thereby. Kim at Para. [0094].

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		Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098].

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		 Kim at FIG. 6. The UE configured to perform CoMP attempts to decode DCI according to each of a TM dependent DCI format and a fallback DCI format in an associated SS, by a higher-layer signal transmitted by the eNB. In FIG. 7 and FIG. 8, DCI format B, which is the TM dependent DCI format, corresponds to a DCI format defined for CoMP. The UE transmits ACK/NACK for TM dependent DCI or ACK/NACK for a PDSCH according to the TM dependent DCI to the eNB, using a PUCCH resource linked to a CCE index (e.g. CCE n) of a PDCCH carrying the TM dependent DCI (DCI format B) or fallback DCI (DCI format A). According to the present invention, upon detecting the TM dependent DCI corresponding to CoMP, the UE determines a PUCCH resource linked to the CCE index n of the PDCCH carrying the TM dependent DCI among dynamic PUCCH resources separately configured from conventional dynamic PUCCH resources.

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		For example, referring to FIG. 7, upon detecting the TM dependent DCI, the UE transmits corresponding ACK/NACK to the eNB using a PUCCH resource 'm+K' linked to the CCE index n among PUCCH resources B which are a set of PUCCH resources separately configured for CoMP. Meanwhile, when the UE should switch to a fallback mode, the UE determines a PUCCH resource linked to the CCE index n of the PDCCH carrying the fallback DCI among PUCCH resources A which are a set of the conventional dynamic PUCCH resources. For example, the UE transmits corresponding ACK/NACK to the eNB using a PUCCH resource m linked to the CCE index n among the PUCCH resources B. In other words, the UE may receive a plurality of PUCCH resource index offset values from the eNB and determine a PUCCH resource by applying a different offset value according to whether the fallback DCI is detected or the TM dependent DCI is detected. Referring to FIG. 7, the UE operating in the fallback mode determines a dynamic PUCCH resource by configuring a PUCCH resource index offset as N(1) PUCCH and the UE operating in the CoMP mode determines a dynamic PUCCH resource by configuring the PUCCH resource index offset as 'N(1) PUCCH+K'. Kim at Para. [0105].

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		The diagram illustrates the mapping from a Control Channel Element (CCE) to an Antenna Port (AN). At the top, a horizontal sequence of boxes represents CCEs, indexed from $n-1$ to $n+3$. An arrow labeled "One CCE" points to box n, and an arrow labeled "CCE index" points to the index n. Below this sequence, a vertical stack of boxes represents the DCI (Downlink Control Information) formats: PDCCH(L=2), DCI format A (labeled "Fallback DCI"), and DCI format B (labeled "TM dependent DCI"). Two dashed arrows originate from the bottom of the DCI stack. One arrow, labeled "n-to-m linkage (CCE-to-AN)", points to box m in a sequence of boxes for "PUCCH resource A" (indices $m-1$ to $m+3$). The other arrow, labeled "n-to-'m+K' linkage (CCE-to-AN)", points to box $m+K$ in a sequence of boxes for "PUCCH resource B" (indices $m+K-1$ to $m+K+3$). A label "K=offset value" points to the index $m+K$. Kim at FIG. 7.

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		 Kim at FIG. 8. In addition to the PUCCH resource index, ACK/NACK transmission related parameters including a PUCCH/PUSCH DMRS sequence, power control setting, a PUCCH payload sequence, and a hopping pattern may vary with the detected DCI format. In other words, the eNB may configure the ACK/NACK transmission related parameters including the PUCCH/PUSCH DMRS sequence, power control setting, PUCCH payload sequence, and hopping pattern as parameters for the TM dependent DCI format separately from parameters for the fallback DCI format and transmit the configured parameters to the UE. Upon detecting the fallback DCI format, the UE may transmit a PUCCH by applying the parameters for the fallback DCI and, upon detecting the TM dependent DCI format, the UE may transmit the PUCCH by applying the parameters for the TM dependent DCI. For example, the eNB may separately configure DMRS sequences, power control parameters, etc. with respect to a DCI format (e.g. DCI format 0) for fallback PUSCH transmission and a DCI format (e.g. DCI format 4) for TM dependent

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		PUSCH transmission (for MIMO transmission) and may signal the separately configured sequences, parameters, etc. to the UE. The UE may perform PUSCH transmission by applying a DMRS sequence, a power control parameter, etc. corresponding to a detected DCI format among the pre-configured DMRS sequences, power control parameters, etc. Kim at Para. [0109]. The 128 Application supports these disclosures. <i>See</i> 128 Application at Fig. 3-(a), page 21 of 22, 19 of 22, 17 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at Fig. 9, Fig. 1, Abstract, (57), [15]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[e]	wherein the resource allocated to the uplink control channel is determined based on at least one of: i) information on a resource of a downlink control channel for scheduling the downlink data; ii) the information on the resource allocated to the uplink control channel; and iii) the start offset	At least under Pegasus's apparent infringement theory, Kim discloses the resource allocated to the uplink control channel is determined based on at least one of: i) information on a resource of a downlink control channel for scheduling the downlink data; ii) the information on the resource allocated to the uplink control channel; and iii) the start offset information on the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless

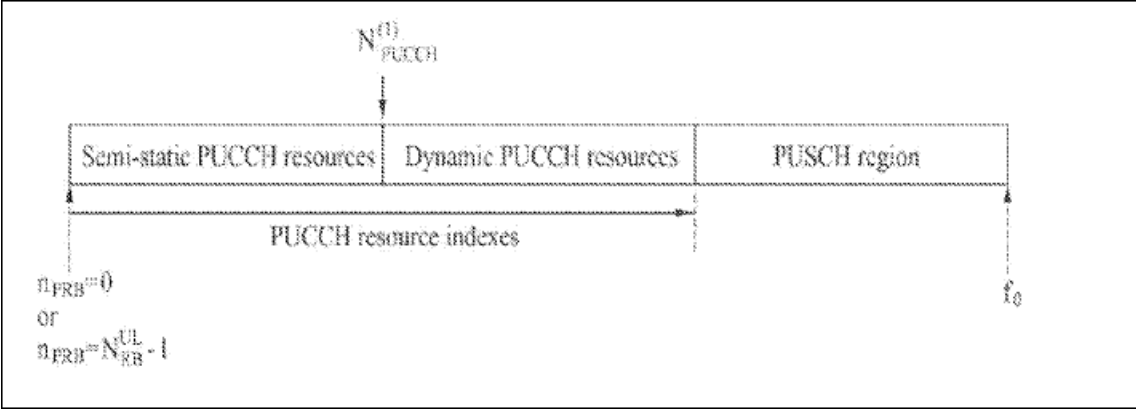
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	information on the resource allocated to the uplink control channel;	communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$” where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010]. As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. A UE is assigned PUCCH resources for UCI transmission by an eNB through higher-layer signaling, dynamic control signaling, or an implicit scheme. Physical resources used for PUCCHs depend on two parameters, $N^{(2)}_{\text{RB}}$ and $N^{(1)}_{\text{CS}}$, given by higher layers. The parameter $N^{(2)}_{\text{RB}}$, which is equal to or greater than 0 ($N^{(2)}_{\text{RB}} \geq 0$), indicates available bandwidth for PUCCH format 2/2a/2b transmission at each slot and is expressed as an integer multiple of $N^{\text{RB}}_{\text{SC}}$. The parameter $N^{(1)}_{\text{CS}}$ indicates the number of cyclic shifts used for PUCCH format 1/1a/1b in an RB used for a mixture of format 1/1a/1b and format 2/2a/2b. A value of $N^{(1)}_{\text{CS}}$ is an integer multiple of $\Delta^{\text{PUCCH}}_{\text{shift}}$ within a range of $\{0, 1, \dots, 7\}$. $\Delta^{\text{PUCCH}}_{\text{shift}}$ is provided by higher layers. If $N^{(1)}_{\text{CS}}$ is 0, no

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		mixed RBs are present. At each slot, at most one RB supports a mixture of PUCCH format 1/1a/1b and PUCCH format 2/2a/2b. Resources used for transmission of PUCCH format 1/1a/1b, PUCCH format 2/2a/2b, and PUCCH format 3 by antenna port p are expressed by $n^{(1,p)}_{\text{PUCCH}}$, $n^{(2,p)}_{\text{PUCCH}} \cdot N^{(2)}_{\text{RB}} N^{(1)}_{\text{sc}} + \text{ceil}(N^{(1)}_{\text{cs}}/8) \cdot (N^{(1)}_{\text{sc}} - N^{(1)}_{\text{cs}} - 2)$, and $n^{(2,p)}_{\text{PUCCH}}$, respectively, which are indexes of non-negative integer indexes. Kim at Para. [0085]. In each aspect of the present invention, when the format of the downlink control information is a second format rather than the first format, the ACK/NACK information may be transmitted to the base station from the user equipment using at least one of a PUCCH resource determined based on “[Equation 2] $n^{(1)}_{\text{PUCCH}} = n_{\text{CCE}} + N^{(1)}_{\text{PUCCH}}$” and a PUCCH resource determined based on “[Equation 3] $n^{(1)}_{\text{PUCCH}} = n_{\text{CCE}} + 1 + N^{(1)}_{\text{PUCCH}}$”. Kim at Para. [0015]. PUCCH resources are configured based on a cell ID. A UE acquires an ID of a cell accessed thereby and configures PUCCH resources for PUCCH transmission in the cell, that is, PUCCH transmission to a node of the cell, based on the cell ID. The PUCCH resources configured based on one cell ID include PUCCH resources for transmission of CSI, PUCCH resources for transmission of semi-persistent scheduling (SPS) ACK/NACK and SR, and PUCCH resources for transmission of dynamic ACK/NACK (i.e. dynamically allocated PUCCH resources linked with a PDCCH). In a 3GPP LTE/LTE-A system, PUCCH resources for transmission of CSI, SPS ACK/NACK, SR, etc. are semi-statically reserved explicitly for the UE by a higher-layer signal. Hereinafter, for ACK/NACK transmission, a PUCCH resource dynamically determined in association with a PDCCH is especially referred to as a dynamic PUCCH resource or an implicit PUCCH resource, and a PUCCH resource explicitly configured by a higher-layer signal is referred to as a semi-static PUCCH resource or an explicit PUCCH resource. In addition, a PUCCH resource for CSI transmission is referred to as a CSI PUCCH resource or a CSI resource, a PUCCH resource for SPS ACK/NACK transmission is referred to as an SPS ACK/NACK PUCCH resource or an SPS ACK/NACK resource, a PUCCH resource for SR transmission is referred to as an SR

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		PUCCH resource or an SR resource, and a PUCCH resource for ACK/NACK transmission associated with a PDCCH is referred to as an ACK/NACK PUCCH resource or an ACK/NACK resource. Kim at Para. [0092]. Referring to Equation 2, PUCCH resources for ACK/NACK are not pre-allocated to each UE and a plurality of UEs in a cell dividedly uses a plurality of PUCCH resources at each time point. Specifically, PUCCH resources used by the UE to carry ACK/NACK are dynamically determined based on a PDCCH carrying scheduling information for a PDSCH carrying corresponding DL data. An entire region in which the PDCCH is transmitted in each DL subframe includes a plurality of CCEs and the PDCCH transmitted to the UE is composed of one or more CCEs. The UE transmits ACK/NACK through a PUCCH resource linked to a specific CCE (e.g. first CCE) among the CCEs constituting the PDCCH received thereby. Kim at Para. [0094]. $m = \begin{cases} N_{RB}^{(2)} & \text{if } n_{PUCCH}^{(1,p)} < c \cdot N_{cs}^{(1)} / \Delta_{shift}^{PUCCH} \\ \left\lceil \frac{n_{PUCCH}^{(1,p)} - c \cdot N_{cs}^{(1)} / \Delta_{shift}^{PUCCH}}{c \cdot N_{sc}^{RB} / \Delta_{shift}^{PUCCH}} \right\rceil + N_{RB}^{(2)} + \left\lceil \frac{N_{cs}^{(1)}}{8} \right\rceil & \text{otherwise} \end{cases} \quad [\text{Equation 2}]$ $c = \begin{cases} 3 & \text{normal cyclic prefix} \\ 2 & \text{extended cyclic prefix} \end{cases}$ Kim at Equation 2. In Equation 2, $n_{PUCCH}^{(1,p)}$ denotes a PUCCH resource index of an antenna port p for PUCCH format 1/1a/1b. In the case of an ACK/NACK PUCCH, $n_{PUCCH}^{(1,p)}$ is a value implicitly determined by the first CCE index of a PDCCH carrying scheduling information of a corresponding PDSCH. Kim at Para. [0088].

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		Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098]. The UE configured to perform CoMP attempts to decode DCI according to each of a TM dependent DCI format and a fallback DCI format in an associated SS, by a higher-layer signal transmitted by the eNB. In FIG. 7 and FIG. 8, DCI format B, which is the TM dependent DCI format, corresponds to a DCI format defined for CoMP. The UE transmits ACK/NACK for TM dependent DCI or ACK/NACK for a PDSCH according to the TM dependent DCI to the eNB, using a PUCCH resource linked to a CCE index (e.g. CCE n) of a PDCCH carrying the TM dependent DCI (DCI format B) or fallback DCI (DCI format A). According to the present invention, upon detecting the TM dependent DCI corresponding to CoMP, the UE determines a PUCCH resource linked to the CCE index n of the PDCCH carrying the TM dependent DCI among dynamic PUCCH resources separately configured from conventional dynamic PUCCH resources. For example, referring to FIG. 7, upon detecting the TM dependent DCI, the UE

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		transmits corresponding ACK/NACK to the eNB using a PUCCH resource 'm+K' linked to the CCE index n among PUCCH resources B which are a set of PUCCH resources separately configured for CoMP. Meanwhile, when the UE should switch to a fallback mode, the UE determines a PUCCH resource linked to the CCE index n of the PDCCH carrying the fallback DCI among PUCCH resources A which are a set of the conventional dynamic PUCCH resources. For example, the UE transmits corresponding ACK/NACK to the eNB using a PUCCH resource m linked to the CCE index n among the PUCCH resources B. In other words, the UE may receive a plurality of PUCCH resource index offset values from the eNB and determine a PUCCH resource by applying a different offset value according to whether the fallback DCI is detected or the TM dependent DCI is detected. Referring to FIG. 7, the UE operating in the fallback mode determines a dynamic PUCCH resource by configuring a PUCCH resource index offset as N(1) PUCCH and the UE operating in the CoMP mode determines a dynamic PUCCH resource by configuring the PUCCH resource index offset as 'N(1) PUCCH+K'. Kim at Para. [0105]. Referring to FIG. 5, PUCCH resources based on one cell ID are arranged in order of CSI PUCCH resources, SPS ACK/NACK and SR PUCCH resources, and dynamic ACK/NACK PUCCH resources in the direction of a DC subcarrier (i.e. a subcarrier mapped to fo in a frequency up-conversion procedure) from subcarriers distant from the DC subcarrier. In other words, semi-statically configured PUCCH resources through higher-layer signaling are located at an outer side of UL transmission bandwidth and dynamically configured ACK/NACK PUCCH resources are located nearer a center frequency than the semi-statically configured PUCCH resources. In this case, as a PUCCH resource approaches the center frequency, a PUCCH resource index increases. Namely, the index of a PUCCH resource allocated to a PRB near the center frequency is larger than the index of a PUCCH resource allocated to a PRB distant from the center frequency. A plurality of PUCCH resources in the same PRB is indexed based on an orthogonal sequence and/or a cyclic shift. Kim at Para. [0093].

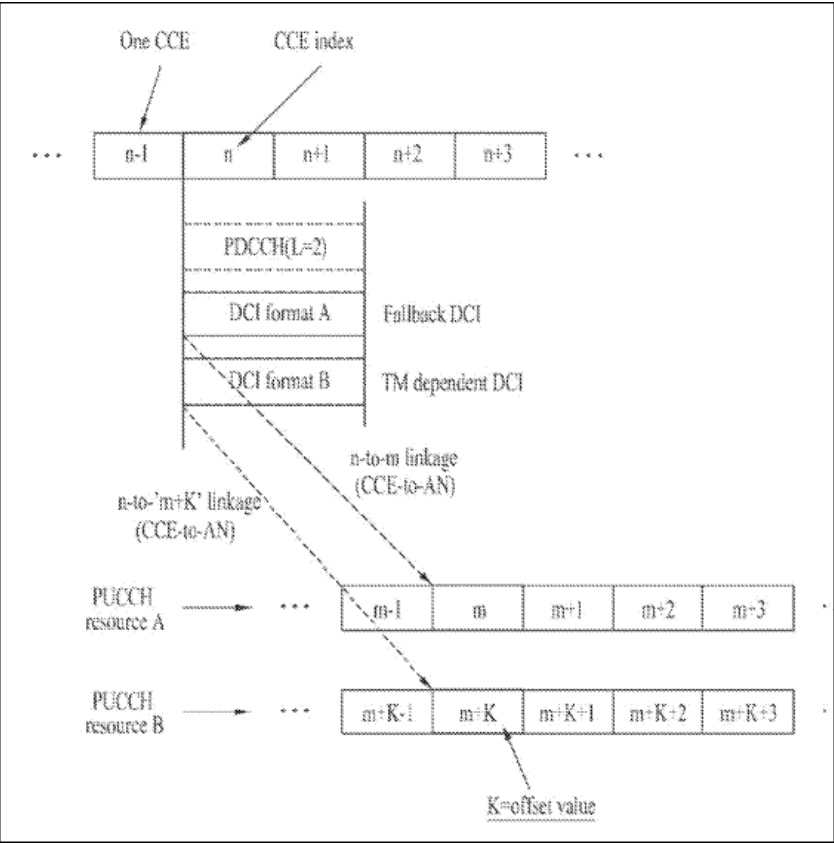
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		 Kim at FIG. 5. In FIG. 10, a value indicating a relative location calculated based on $N(1)$ PUCCH indicating the start location of dynamic PUCCH resources of a specific cell (cell of RX point 1) is used as an offset value (K or L) indicating the start location of dynamic PUCCH resources configured per RX point according to the present invention. However, a value indicating an absolute start location rather than a relative value based on $N(1)$ PUCCH of a specific cell may be used as the offset value indicating the start location of separately configured dynamic PUCCH resources according to the present invention. Kim at Para. [0164]. According to a 3GPP LTE/LTE-A system up to now, all UEs serviced in a specific cell semi-statically receive information indicating the same $N(1)$ PUCCH from an eNB of the cell. In other words, according to a legacy 3GPP LTE/LTE-A system, UEs located in a specific cell share dynamic PUCCH resources after $N(1)$ PUCCH and the dynamic PUCCH resources are linked to CCE indexes commonly applied to the specific cell, respectively. If a cell in which the UE receives a DL signal is the same as a cell in which the UE transmits a UL signal, the UE may determine the dynamic PUCCH resources

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		without any problem using only a cell-specifically provided N(1) PUCCH. However, in CoMP in which a cell (DL cell) in which the UE receives a DL signal may be different from a cell (UL cell) in which the UE transmits a UL signal, PUCCH resources configured per cell may differ. Hereinafter, a node of the DL cell will be referred to as a TX point and a node of the UL cell will be referred to as an RX point. When the TX point is different from the RX point, an index of a PUCCH resource linked to a CCE of a PDCCH received in the DL cell may become a different index in the UL cell and the PUCCH resource may be linked to a CCE of a different PDCCH in the UL cell. Moreover, since semi-static PUCCH resources are independently reserved per cell, a start location of a dynamic PUCCH resource of the DL cell may differ from a start location of a dynamic PUCCH resource of the UL cell. In this case, a PUCCH resource linked to a specific CCE cannot be determined using only one N(1) PUCCH. Accordingly, the present invention provides a method for efficiently using a PUCCH resource in a CoMP situation in which the DL cell and UL cell may be different. Kim at Para. [0101]. FIG. 7 illustrates an example of determining a dynamic PUCCH resource according to an embodiment of the present invention and FIG. 8 illustrates an example of CoMP to which the present invention is applicable. Kim at Para. [0103].

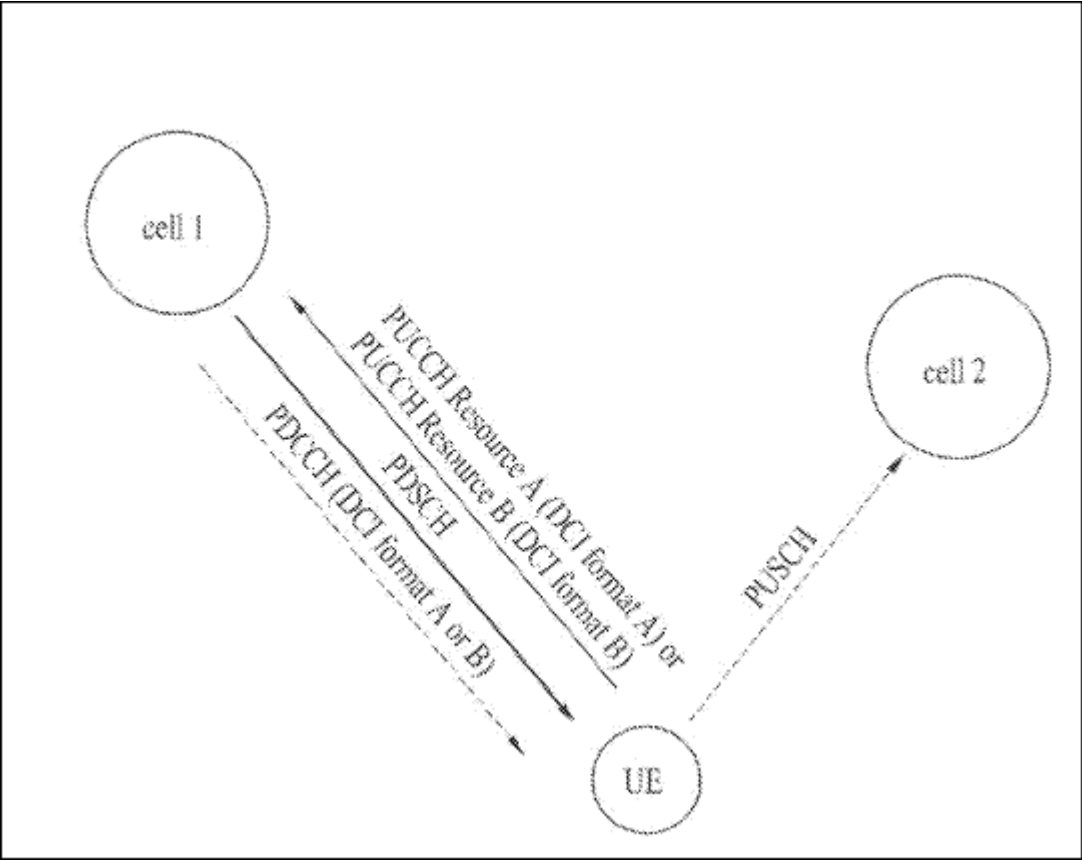
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Kim at Fig. 7.

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		 Kim at Fig. 8. FIG. 9 illustrates an example of determining one PUCCH resource among new PUCCH resources configured according to an embodiment of the present invention. Kim at Para. [0128]. Equation 9 and Equation 10 are special types of Equation 6 or Equation 7. Equation 5 and Equation 6, for mapping a CCE index to a PUCCH resource index, are to map, for

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		example, M CCEs to M PUCCH resources in one-to-one correspondence as illustrated in FIG. 9(a), whereas Equation 9 and Equation 10 are to map, for example, M CCEs to N (N=3 in FIG. 9(b)) PUCCH resources where N is less than M as illustrated in FIG. 9(b). Accordingly, excessive reservation of dynamic PUCCH resources can be prevented and a plurality of PUCCH resource regions can be configured. Each of the plurality of PUCCH resource regions may be allocated to a specific UE, specific UE-group, or a specific TM. Kim at Para. [0130]. The diagram consists of two parts, (a) and (b), each showing a mapping from CCE indices to PUCCH resource indices. Part (a) shows a one-to-one mapping. The top row is labeled 'CCE index' and contains a sequence of boxes numbered 0, 1, 2, 3, 4, 5, 6, 7, followed by an ellipsis and then M-1. The bottom row is labeled 'PUCCH resource index' and contains a sequence of boxes numbered 0, 1, 2, 3, 4, 5, 6, 7, followed by an ellipsis and then M-1. Vertical arrows point from each CCE index box to its corresponding PUCCH resource index box. Below the PUCCH resource index row, the text $N_{PUCCH}^{(i)}$ is shown with an arrow pointing to the first box (index 0). Below this part is the caption '(a) M CCEs to M PUCCH resources mapping'. Part (b) shows a many-to-few mapping. The top row is labeled 'CCE index' and contains a sequence of boxes numbered 0, 1, 2, 3, 4, 5, 6, 7, followed by an ellipsis and then M-1. The bottom row is labeled 'PUCCH resource index' and contains a sequence of boxes numbered 0, 1, 2. Arrows point from CCE index boxes 0, 1, 2, 3, 4, 5, 6, and 7 to PUCCH resource index boxes 0, 1, and 2 respectively. Specifically, CCE 0 maps to PUCCH 0, CCE 1 to PUCCH 1, CCE 2 to PUCCH 2, CCE 3 to PUCCH 0, CCE 4 to PUCCH 1, CCE 5 to PUCCH 2, CCE 6 to PUCCH 0, and CCE 7 to PUCCH 1. Below the PUCCH resource index row, the text $N_{PUCCH}^{(i)} + \delta_{PUCCH}^{(i)}$ is shown with an arrow pointing to the first box (index 0). Below this part is the caption '(b) M CCEs to N PUCCH resources mapping (N < M)'. Kim at FIG. 9.

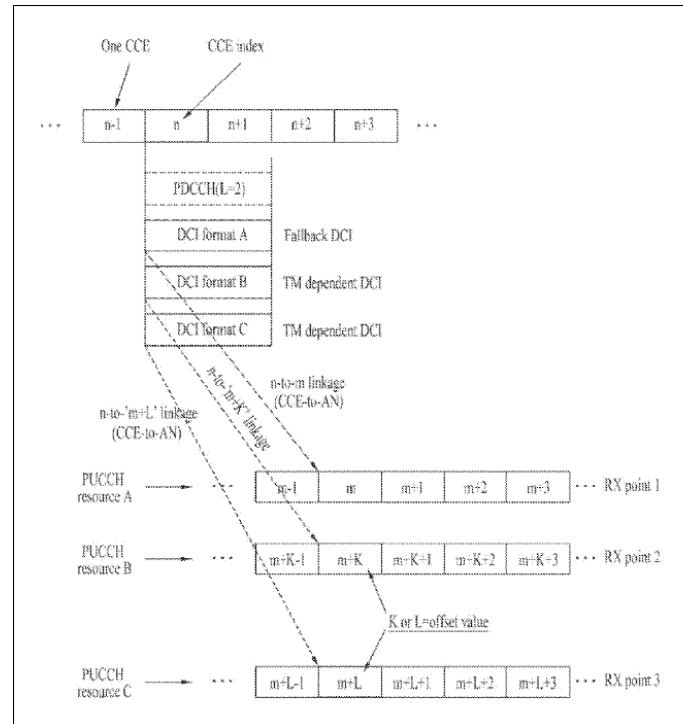
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		FIG. 10 illustrates another example of determining a dynamic PUCCH resource according to an embodiment of the present invention. Particularly, FIG. 10 illustrates PUCCH resource linkage/reservation when UL dynamic point selection (DPS) is enabled. Kim at Para. [0162]. UL DPS entails an operation of frequently changing target RX points of UL transmission. If a target RX point has a cell ID different from a conventional cell ID, PUCCH and PUSCH transmission suitable for a changed target cell should be performed. Since a resource linked to a cell ID is allocated for PUCCH transmission, the UE needs to differently generate a PUCCH resource depending on to which point a PUCCH is transmitted. Accordingly, the UE should be configured to generate the PUCCH resource according to a cell ID of a target RX point to which the PUCCH is transmitted. Meanwhile, since path loss differs according to the target RX point, it is desirable to differently set a power control offset according to the target RX point. Therefore, the present invention proposes controlling UL power per RX point. Assuming that a set of points that the UE can dynamically select is a DPS set, the UE should know, for example, a PUCCH/PUSCH/SRS power control offset per cell ID included in the DPS set and determine a power control offset of any channel of any cell every UL transmission time point, thereby applying the determined power control offset to UL transmission to a corresponding cell. The eNB may pre-configure a plurality of power control offsets to signal the configured offsets to the UE and dynamically or explicitly indicate a power control offset among the plural power control offsets so that the UE may perform UL transmission by applying the power control offset. Alternatively, the UE may select one of the plural power control offsets according to a predetermined condition so that the selected power control offset may be applied to UL transmission. Upon detecting CoMP dependent DCI, the UE may be configured to apply such an operation to a PUCCH resource reserved for CoMP. Referring to FIG. 10, the PUCCH resource reserved for CoMP may be reserved by a PUCCH resource index offset (K or L) for a conventional dynamic PUCCH resource in terms of one cell.

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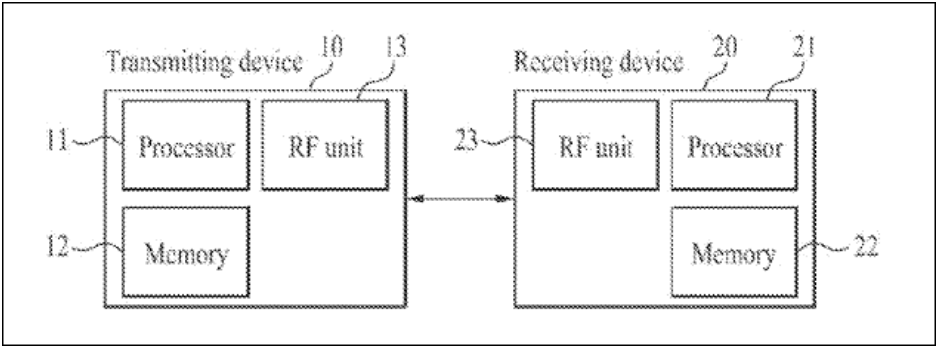
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Furthermore, when UL DPS is performed, a PUCCH resource index offset may be configured per a plurality of target RX points.
Kim at Para. [0163].



Kim at FIG. 10.

FIG. 12 is a block diagram illustrating elements of a transmitting device 10 and a receiving device 20 for implementing the present invention.
Kim at Para. [0038].

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		 Kim at FIG. 12. The 128 Application supports these disclosures. <i>See</i> 128 Application at 17 of 22, 19 of 20, 21 of 22, Drawing 3-(b), Figure 3-(a). PCT 493 supports these disclosures. <i>See</i> PCT 493 at Fig. 9, Fig. 7, Fig. 1, Fig. 11, Fig. 12, Abstract, [10], [15], [78], [99], [111], [150]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[f]	wherein the start offset information of the resource allocated to the uplink control channel is configured separated from start	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information of the resource allocated to the uplink control channel is configured separated from start offset information for a terminal different from the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations:

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	offset information for a terminal different from the MTC terminal;	With appearance and spread of machine-to-machine (M2M) communication and a variety of devices such as smartphones and tablet PCs and technology demanding a large amount of data transmission, data throughput needed in a cellular network has rapidly increased. To satisfy such rapidly increasing data throughput, carrier aggregation technology, cognitive radio technology, etc. for efficiently employing more frequency bands and multiple input multiple output (MIMO) technology, multi-eNB cooperation technology, etc. for raising data capacity transmitted on limited frequency resources have been developed. In addition, a communication environment has evolved into increasing density of nodes accessible by a user equipment (UE) at the periphery of the nodes. A node refers to a fixed point capable of transmitting/receiving a radio signal to/from a UE through one or more antennas. A communication system including high-density nodes may provide a better communication service to the UE through cooperation between the nodes. Kim at Para. [0002]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and

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		operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097]. The diagram illustrates the mapping between CCEs and PUCCH resources. At the top, a horizontal sequence of boxes represents CCEs with indices n-1, n, n+1, n+2, and n+3. A label 'One CCE' points to box n, and 'CCE index' points to the index n. Below this sequence, a vertical stack of boxes represents PUCCH resources: PDCCH(L=2), DCI format A (labeled 'Fallback DCI'), and DCI format B (labeled 'TM dependent DCI'). Two dashed arrows, both labeled 'n-to-m linkage (dynamic CCE-to-AN mapping)', originate from CCE n and point to PUCCH resource boxes m-1 and m. At the bottom, a horizontal sequence of boxes represents PUCCH resources with indices m-1, m, m+1, m+2, and m+3. A label 'PUCCH resource index' points to the index m. Kim at FIG. 6. The present invention proposes configuring additional dynamic PUCCH resources separately from conventional dynamic PUCCH resources. In other words, the present invention proposes UE-specifically, UE group-specifically, or TM-specifically configuring a set of additional dynamic PUCCH resources separately from a set of cell-specifically configured conventional dynamic PUCCH resources. For example, an eNB may configure the additional dynamic PUCCH resources by transmitting a UE-specific, UE group-specific, or TM-specific PUCCH resource index offset value to a UE separately from a cell-specifically provided PUCCH resource index offset value (e.g. N(1) PUCCH). Kim at Para. [0102].

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		The 128 Application supports these disclosures. <i>See</i> 128 Application at page 16 of 22, 17 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at Fig. 9, [2], Table 6, [119]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[g]	wherein a plurality of pieces of start offset information of the resource allocated to the uplink control channel are provided, and the plurality of pieces of start offset information are received through cell-specific high layer signaling for the MTC terminal from a base station;	At least under Pegasus's apparent infringement theory, Kim discloses a plurality of pieces of start offset information of the resource allocated to the uplink control channel are provided, and the plurality of pieces of start offset information are received through cell-specific high layer signaling for the MTC terminal from a base station. For example, Kim discloses this limitation based on the following exemplary citations: As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017].

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		As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. In each aspect of the present invention, information indicating enablement or disablement of the parameter sets may be transmitted to the user equipment from the base station. When the parameter sets are disabled, a predefined parameter set may be used. Kim at Para. [0021]. Meanwhile, in the present invention, a cell refers to a prescribed geographical area to which one or more nodes provide a communication service. Accordingly, in the present invention, communicating with a specific cell may mean communicating with an eNB or a node which provides a communication service to the specific cell. In addition, a downlink/uplink signal of a specific cell refers to a downlink/uplink signal from/to an eNB or a node which provides a communication service to the specific cell. Furthermore, channel status/quality of a specific cell refers to channel status/quality of a channel or communication link formed between an eNB or node which provides a communication service to the specific cell and a UE. In a 3GPP LTE-A based system, the UE may measure a downlink channel state from a specific node using a channel state information-reference signal(s) (CSI-RS(s)) transmitted on a CSI-RS resource allocated to the specific node by an antenna port(s) of the specific node. Generally, neighboring nodes transmit corresponding CSI-RSs on orthogonal CSI-RS resources. When CSI-RS resources are orthogonal, this mean that CSI-RS resources have different subframe configurations and/or CSI-RS sequences which specify subframes to which CSI-RSs are allocated according to CSI-RS resource configurations, subframe offsets

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		and transmission periods, etc. which specify symbols and subcarriers carrying the CSI RSs. Kim at Para. [0045]. In the meantime, in order to maintain operation load based on blind decoding at a certain level or less, not all the DCI formats are searched at the same time. For example, the UE is configured semi-statically by upper layer signaling to receive PDSCH data signaled through the PDCCH in accordance with one of transmission modes 1 to 9. Table 6 illustrates a transmission mode for configuring multi-antenna technology and a DCI format where the UE performs blind decoding in accordance with the corresponding transmission mode. Kim at Para. [0066]. The DMRS or SRS, associated with PUSCH transmission or PUCCH transmission, is defined by a cyclic shift of a base sequence according to a predetermined rule. For example, an RS sequence $r_{u,v}^{(\alpha)}(n)$ may be defined as $e^{j\alpha n} r_{u,v}(n)$ ($0 \leq n \leq M_{sc}^{RS}$). Here, M_{sc}^{RS} ($=mN_{sc}^{RB}$) is the length of the RS sequence and $1 \leq m \leq N_{RB}^{max,UL}$. $N_{RB}^{max,UL}$, an integer multiple of N_{RB}, denotes the maximum configuration of a UL bandwidth. A plurality of RS sequences may be defined from one base sequence through different cyclic shift values α. A plurality of base sequences is defined for the DMRS and SRS. For example, the base sequences may be defined using a root Zadoff-Chu sequence. The base sequences $r_{u,v}(n)$ are divided into base sequence groups, each of which includes one or more base sequences. For example, each base sequence group may include one base sequence ($v=0$) having a length of $M_{sc}^{RS}=mN_{sc}^{RB}$ ($1 \leq m \leq 5$) and two base sequences each having a length of $M_{sc}^{RS}=mN_{sc}^{RB}$ ($6 \leq m \leq N_{sc}^{RB}$). In $r_{u,v}(n)$, $u \in \{0, 1, \dots, 29\}$ is a group number (i.e. a group index) and v denotes a base sequence number (i.e. a base sequence index) in the corresponding group. Each base sequence group number and a base sequence number in the corresponding group may vary with time. A sequence group number u in a slot ns is defined by a group hopping pattern and a sequence shift pattern. A plurality of different hopping patterns and a plurality of different sequence shift patterns are present. Although a PUCCH and a PUSCH have the same hopping

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		pattern, they may have different sequence shift patterns. The group hopping pattern may be cell-specifically configured using a pseudo-random sequence generator using a cell ID Ncell ID. The pseudo-random sequence for the group hopping pattern is initialized to a specific initial value (e.g. $c_{init}=\text{floor}(\text{Ncell ID}/30)$) at the start of each radio frame. The sequence shift pattern f^{PUCCH}_{ss} for the PUCCH may be given based on a cell ID (e.g. $f^{PUCCH}_{ss}=\text{Ncell ID mod } 30$) and the sequence shift pattern f^{PUCCH}_{ss} for the PUSCH may be given using a value Δ_{ss} configured by higher layers (e.g. $f^{PUCCH}_{ss}=(f^{PUCCH}_{ss}+\Delta_{ss})\text{mod } 30$) where $\Delta_{ss}\in\{0, 1, \dots, 29\}$). Kim at Para. [0072]. Table 8 illustrates mapping of a cyclic shift (cyclicShift) to $n^{(1)}_{DMRS}$ by higher-layer signaling. <table> <tr> <th colspan="2">TABLE 8</th> </tr> <tr> <th>cyclicShift</th> <th>$n_{DMRS}^{(1)}$</th> </tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>2</td></tr> <tr><td>2</td><td>3</td></tr> <tr><td>3</td><td>4</td></tr> <tr><td>4</td><td>6</td></tr> <tr><td>5</td><td>8</td></tr> <tr><td>6</td><td>9</td></tr> <tr><td>7</td><td>10</td></tr> </table> Kim at Para. [0075]. If a UE employs an SC-FDMA scheme in UL transmission, in a 3GPP LTE release-8 or release-9 system, a PUCCH and a PUSCH cannot be simultaneously transmitted on one carrier in order to maintain a single carrier property. In a 3GPP LTE release-10 system, support/non-support of simultaneous transmission of the PUCCH and the PUSCH may be indicated by higher layers. Kim at Para. [0076]. A UE is assigned PUCCH resources for UCI transmission by an eNB through higher-layer signaling, dynamic control signaling, or an implicit scheme. Physical resources	TABLE 8		cyclicShift	$n_{DMRS}^{(1)}$	0	0	1	2	2	3	3	4	4	6	5	8	6	9	7	10
TABLE 8																						
cyclicShift	$n_{DMRS}^{(1)}$																					
0	0																					
1	2																					
2	3																					
3	4																					
4	6																					
5	8																					
6	9																					
7	10																					

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		used for PUCCHs depend on two parameters, $N_{RB}^{(2)}$ and $N_{CS}^{(1)}$, given by higher layers. The parameter $N_{RB}^{(2)}$, which is equal to or greater than 0 ($N_{RB}^{(2)} \geq 0$), indicates available bandwidth for PUCCH format 2/2a/2b transmission at each slot and is expressed as an integer multiple of N_{sc}^{RB}. The parameter $N_{CS}^{(1)}$ indicates the number of cyclic shifts used for PUCCH format 1/1a/1b in an RB used for a mixture of format 1/1a/1b and format 2/2a/2b. A value of $N_{CS}^{(1)}$ is an integer multiple of Δ_{shift}^{PUCCH} within a range of $\{0, 1, \dots, 7\}$. Δ_{shift}^{PUCCH} is provided by higher layers. If $N_{CS}^{(1)}$ is 0, no mixed RBs are present. At each slot, at most one RB supports a mixture of PUCCH format 1/1a/1b and PUCCH format 2/2a/2b. Resources used for transmission of PUCCH format 1/1a/1b, PUCCH format 2/2a/2b, and PUCCH format 3 by antenna port p are expressed by $n_{PUCCH}^{(1,p)}$, $n_{PUCCH}^{(2,p)} \cdot N_{sc}^{RB} + \text{ceil}(N_{CS}^{(1)}/8) \cdot (N_{sc}^{RB} - N_{CS}^{(1)} - 2)$, and $n_{PUCCH}^{(2,p)}$, respectively, which are indexes of non-negative integer indexes. Kim at Para. [0085]. In Equation 2, $n_{PUCCH}^{(1,p)}$ denotes a PUCCH resource index of an antenna port p for PUCCH format 1/1a/1b. In the case of an ACK/NACK PUCCH, $n_{PUCCH}^{(1,p)}$ is a value implicitly determined by the first CCE index of a PDCCH carrying scheduling information of a corresponding PDSCH. Kim at Para. [0088]. $m = \begin{cases} N_{RB}^{(2)} & \text{if } n_{PUCCH}^{(1,p)} < c \cdot N_{CS}^{(1)} / \Delta_{shift}^{PUCCH} \\ \left\lfloor \frac{n_{PUCCH}^{(1,p)} - c \cdot N_{CS}^{(1)} / \Delta_{shift}^{PUCCH}}{c \cdot N_{sc}^{RB} / \Delta_{shift}^{PUCCH}} \right\rfloor + N_{RB}^{(2)} + \left\lceil \frac{N_{CS}^{(1)}}{8} \right\rceil & \text{otherwise} \end{cases}$ $c = \begin{cases} 3 & \text{normal cyclic prefix} \\ 2 & \text{extended cyclic prefix} \end{cases}$ PUCCH resources are configured based on a cell ID. A UE acquires an ID of a cell accessed thereby and configures PUCCH resources for PUCCH transmission in the cell, that is, PUCCH transmission to a node of the cell, based on the cell ID. The PUCCH resources configured based on one cell ID include PUCCH resources for transmission of

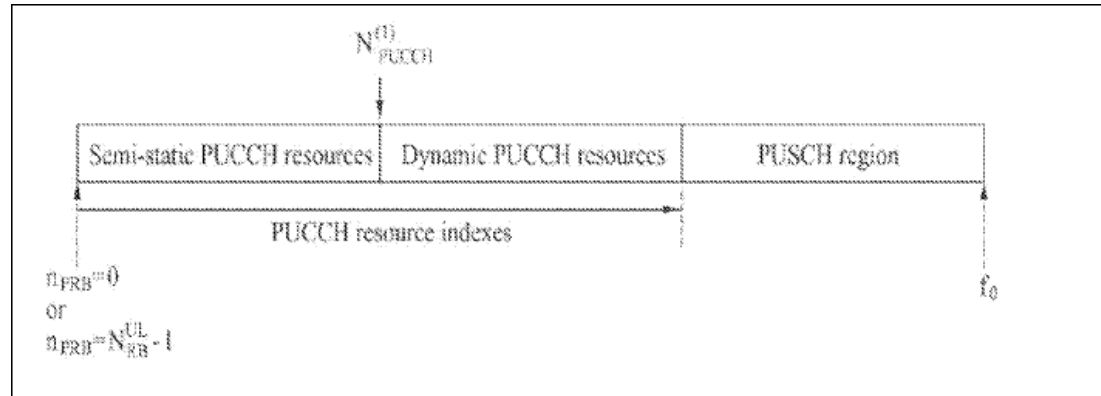
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		CSI, PUCCH resources for transmission of semi-persistent scheduling (SPS) ACK/NACK and SR, and PUCCH resources for transmission of dynamic ACK/NACK (i.e. dynamically allocated PUCCH resources linked with a PDCCH). In a 3GPP LTE/LTE-A system, PUCCH resources for transmission of CSI, SPS ACK/NACK, SR, etc. are semi-statically reserved explicitly for the UE by a higher-layer signal. Hereinafter, for ACK/NACK transmission, a PUCCH resource dynamically determined in association with a PDCCH is especially referred to as a dynamic PUCCH resource or an implicit PUCCH resource, and a PUCCH resource explicitly configured by a higher-layer signal is referred to as a semi-static PUCCH resource or an explicit PUCCH resource. In addition, a PUCCH resource for CSI transmission is referred to as a CSI PUCCH resource or a CSI resource, a PUCCH resource for SPS ACK/NACK transmission is referred to as an SPS ACK/NACK PUCCH resource or an SPS ACK/NACK resource, a PUCCH resource for SR transmission is referred to as an SR PUCCH resource or an SR resource, and a PUCCH resource for ACK/NACK transmission associated with a PDCCH is referred to as an ACK/NACK PUCCH resource or an ACK/NACK resource. Kim at Para. [0092]. $m = \lfloor n_{PUCCH}^{(2,\hat{p})} / N_{sc}^{RB} \rfloor \quad \text{[Equation 3]}$ Kim at Equation 3. where $n^{(2)}$ PUCCH denotes a PUCCH resource index of an antenna port p for PUCCH format 2/2a/2b and is a value transmitted to a UE from an eNB through higher-layer signaling. Kim at Para. [0089]. $m = \lfloor n_{PUCCH}^{(3,\hat{p})} / N_{SF,0}^{PUCCH} \rfloor \quad \text{[Equation 4]}$ Kim at Equation 4.

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		$n^{(3)}_{\text{PUCCH}}$ denotes a PUCCH resource index of an antenna port p for PUCCH format 3 and is a value transmitted to a UE from an eNB through higher-layer signaling. $N_{\text{PUCCH SF},0}$ indicates a spreading factor for the first slot of a subframe. For all of two slots of a subframe using normal PUCCH format 3, $N_{\text{PUCCH SF},0}$ is 5. For first and second slots of a subframe using a reduced PUCCH format 3, $N_{\text{PUCCH SF},0}$ is 5 and 4, respectively. Kim at Para. [0090]. Referring to FIG. 5, PUCCH resources based on one cell ID are arranged in order of CSI PUCCH resources, SPS ACK/NACK and SR PUCCH resources, and dynamic ACK/NACK PUCCH resources in the direction of a DC subcarrier (i.e. a subcarrier mapped to f_0 in a frequency up-conversion procedure) from subcarriers distant from the DC subcarrier. In other words, semi-statically configured PUCCH resources through higher-layer signaling are located at an outer side of UL transmission bandwidth and dynamically configured ACK/NACK PUCCH resources are located nearer a center frequency than the semi-statically configured PUCCH resources. In this case, as a PUCCH resource approaches the center frequency, a PUCCH resource index increases. Namely, the index of a PUCCH resource allocated to a PRB near the center frequency is larger than the index of a PUCCH resource allocated to a PRB distant from the center frequency. A plurality of PUCCH resources in the same PRB is indexed based on an orthogonal sequence and/or a cyclic shift. Kim at Para. [0093].

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Kim at FIG. 5.

Referring to Equation 2, PUCCH resources for ACK/NACK are not pre-allocated to each UE and a plurality of UEs in a cell dividedly uses a plurality of PUCCH resources at each time point. Specifically, PUCCH resources used by the UE to carry ACK/NACK are dynamically determined based on a PDCCH carrying scheduling information for a PDSCH carrying corresponding DL data. An entire region in which the PDCCH is transmitted in each DL subframe includes a plurality of CCEs and the PDCCH transmitted to the UE is composed of one or more CCEs. The UE transmits ACK/NACK through a PUCCH resource linked to a specific CCE (e.g. first CCE) among the CCEs constituting the PDCCH received thereby.

Kim at Para. [0094].

$$m = \begin{cases} N_{RB}^{(2)} & \text{if } n_{PUCCH}^{(1,p)} < c \cdot N_{RB}^{(1)} / \Delta_{shift}^{PUCCH} \\ \left\lceil \frac{n_{PUCCH}^{(1,p)} - c \cdot N_{RB}^{(1)} / \Delta_{shift}^{PUCCH}}{c \cdot N_{RB}^{(1)} / \Delta_{shift}^{PUCCH}} \right\rceil + N_{RB}^{(2)} + \left\lceil \frac{N_{RB}^{(1)}}{8} \right\rceil & \text{otherwise} \end{cases} \quad [\text{Equation 2}]$$

$$c = \begin{cases} 3 & \text{normal cyclic prefix} \\ 2 & \text{extended cyclic prefix} \end{cases}$$

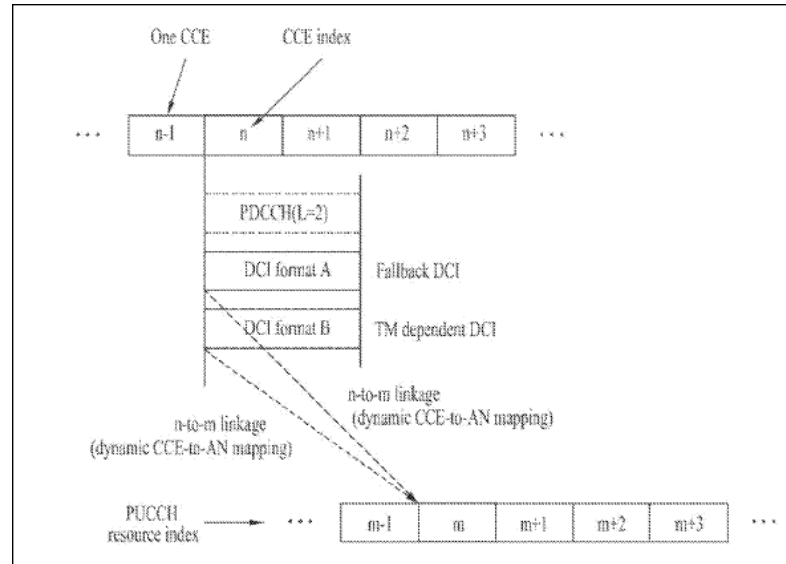
Kim at Equation 2.

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		Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098].

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Kim at FIG. 6.

Specifically, in the 3GPP LTE/LTE-A system, PUCCH resource indexes for transmission by two antenna ports (p0 and p1) are determined as follows. Kim at Para. [0099].

$$n_{PUCCH}^{(1,p=p0)} = n_{CCE} + N_{PUCCH}^{(1)} \quad \text{[Equation 5]}$$

$$n_{PUCCH}^{(1,p=p1)} = n_{CCE} + 1 + N_{PUCCH}^{(1)} \quad \text{[Equation 6]}$$

Kim at Equations 5 & 6.

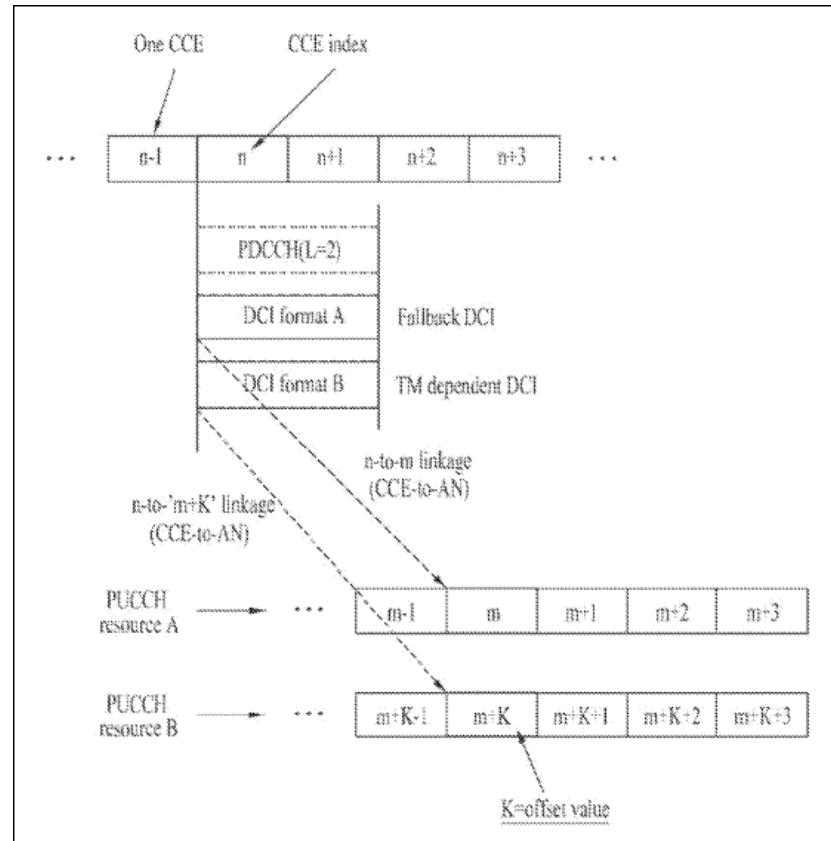
Here, $n(1,p=p0)$ PUCCH denotes a PUCCH resource index (i.e. number) to be used by the antenna port p0, $n(1,p=p1)$ PUCCH denotes a PUCCH resource index to be used by the antenna port p1, and $N(1)$ PUCCH denotes a value signaled from a higher layer. $N(1)$ PUCCH corresponds to a location at which a dynamic PUCCH resource is stated

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		among PUCCH resources of a cell. nCCE corresponds to the smallest value among CCE indexes used for PDCCH transmission. For example, when a CCE aggregation level is 2 or more, the first CCE index among a plurality of CCE indexes aggregated for PDCCH transmission is used to determine an ACK/NACK PUCCH resource. That is, a PUCCH resource used to transmit ACK/NACK for a PDCCH or a PDSCH according to the PDCCH is determined in association with a DL CCE and this is called a dynamic CCE-to-AN linkage. Kim at Para. [0100]. The present invention proposes configuring additional dynamic PUCCH resources separately from conventional dynamic PUCCH resources. In other words, the present invention proposes UE-specifically, UE group-specifically, or TM-specifically configuring a set of additional dynamic PUCCH resources separately from a set of cell-specifically configured conventional dynamic PUCCH resources. For example, an eNB may configure the additional dynamic PUCCH resources by transmitting a UE-specific, UE group-specific, or TM-specific PUCCH resource index offset value to a UE separately from a cell-specifically provided PUCCH resource index offset value (e.g. N(1) PUCCH). Kim at Para. [0102]. FIG. 7 illustrates an example of determining a dynamic PUCCH resource according to an embodiment of the present invention and FIG. 8 illustrates an example of CoMP to which the present invention is applicable. Kim at [0103]. For example, the eNB may configure additional dynamic PUCCH resources by transmitting a UE-specific, UE group-specific, or TM-specific PUCCH resource index offset value K to the UE, separately from a PUCCH resource index offset value (e.g. N(1) PUCCH) cell-specifically provided for cell 1. Kim at [0104].

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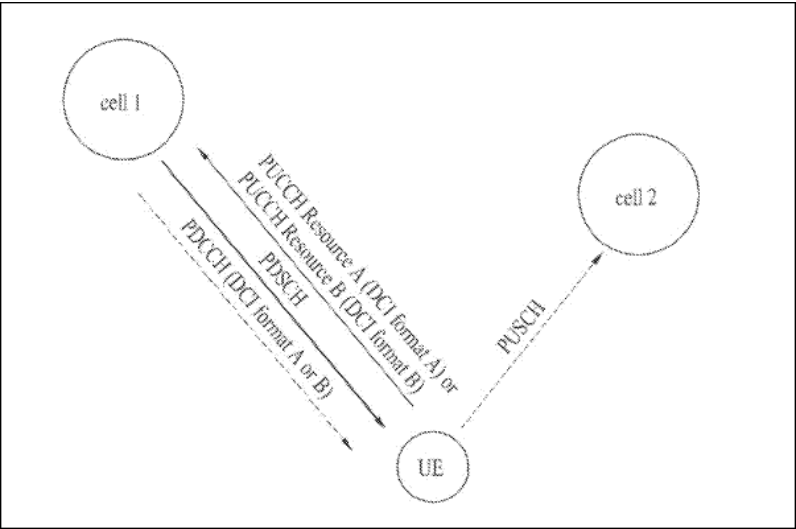
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Kim at Fig. 7.

The UE configured to perform CoMP attempts to decode DCI according to each of a TM dependent DCI format and a fallback DCI format in an associated SS, by a higher-layer signal transmitted by the eNB. In FIG. 7 and FIG. 8, DCI format B, which is the TM dependent DCI format, corresponds to a DCI format defined for CoMP. The UE transmits ACK/NACK for TM dependent DCI or ACK/NACK for a PDSCH according to the TM dependent DCI to the eNB, using a PUCCH resource linked to a CCE index

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		(e.g. CCE n) of a PDCCH carrying the TM dependent DCI (DCI format B) or fallback DCI (DCI format A). According to the present invention, upon detecting the TM dependent DCI corresponding to CoMP, the UE determines a PUCCH resource linked to the CCE index n of the PDCCH carrying the TM dependent DCI among dynamic PUCCH resources separately configured from conventional dynamic PUCCH resources. For example, referring to FIG. 7, upon detecting the TM dependent DCI, the UE transmits corresponding ACK/NACK to the eNB using a PUCCH resource 'm+K' linked to the CCE index n among PUCCH resources B which are a set of PUCCH resources separately configured for CoMP. Meanwhile, when the UE should switch to a fallback mode, the UE determines a PUCCH resource linked to the CCE index n of the PDCCH carrying the fallback DCI among PUCCH resources A which are a set of the conventional dynamic PUCCH resources. For example, the UE transmits corresponding ACK/NACK to the eNB using a PUCCH resource m linked to the CCE index n among the PUCCH resources B. In other words, the UE may receive a plurality of PUCCH resource index offset values from the eNB and determine a PUCCH resource by applying a different offset value according to whether the fallback DCI is detected or the TM dependent DCI is detected. Referring to FIG. 7, the UE operating in the fallback mode determines a dynamic PUCCH resource by configuring a PUCCH resource index offset as $N^{(1)}_{PUCCH}$ and the UE operating in the CoMP mode determines a dynamic PUCCH resource by configuring the PUCCH resource index offset as '$N^{(1)}_{PUCCH}+K$'. Kim at Para. [0105].

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		 Kim at Fig. 8. In the illustrated example of FIG. 7, a value indicating a relative location based on $N^{(1)}_{\text{PUCCH}}$ indicating the start location of the conventional dynamic PUCCH resource among PUCCH resources of a corresponding cell is used as an offset value indicating the start location of the additionally configured dynamic PUCCH resource according to the present invention. However, instead of the relative value based on $N^{(1)}_{\text{PUCCH}}$, a value indicating an absolute start location may be used as the offset value indicating the start location of the additionally configured dynamic PUCCH resource according to the present invention. Kim at Para. [0106]. If PUCCH transmission is permitted only on the PCC, since UCI may be transmitted only on the PCC in both CCS and non-CCS, PCC related PUCCH resources and SCC related PUCCH resources are reserved on the PCC. For example, in CCS, assuming that the PCC is a scheduling CC of an SCC(s), a PUCCH resource(s) for a PDSCH(s) transmitted through the PCC according to a PDCCH transmitted through the PCC and a

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		PUCCH resource(s) for a PDSCH(s) transmitted through the SCC(s) according to the PDCCH transmitted through the PCC are implicitly reserved by CCE indexes of the PDCCHs on the PCC. In non-CCS in which scheduling information of a CC is transmitted only through the corresponding CC, a PUCCH resource(s) associated with a PDCCH(s) transmitted through the PCC are implicitly reserved by a CCE index(es) of the PDCCH(s) and a PUCCH resource(s) associated with a PDCCH(s) transmitted through the SCC are reserved by explicit signaling from an eNB. For example, the eNB semi-statically provides PUCCH resource indexes for the SCC to the UE through higher-layer signaling and the UE may dynamically indicate a PUCCH resource index to be used for actual ACK/NACK transmission using a predetermined field in a DCI format. For example, a TPC field in the DCI format may be used as an ACK/NACK resource indicator (ARI) indicating one of a predetermined number of explicitly configured PUCCH resources. Kim at Para. [0114]. Meanwhile, a mode for dynamic switching/indication between RRC parameter sets may be enabled or disabled by higher-layer (e.g. RRC) signaling. For example, if the dynamic switching/indication mode is disabled by higher-layer signaling, a specific RRC parameter set among the RRC parameter sets may be semi-statically configured. That is, if the dynamic switching/indication mode is disabled by higher-layer signaling, the aforementioned n bits may not be added or the n bits may be regarded as meaningless even when the n bits are added. In other words, the n bits indicating a specific RRC parameter among the RRC parameter sets may be regarded as meaningful only when the dynamic switching/indication mode is enabled. Kim at Para. [0144]. In CA of non-CCS, a PUCCH resource for an SCC may be explicitly configured by higher-layer (e.g. RRC) signaling. However, as in the CCS, only a PUCCH resource region for CoMP may be signaled using a PUCCH resource index offset and an actual individual PUCCH resource may be dynamically allocated. That is, separately from a dynamic PUCCH resource region of a PCC, a dynamic PUCCH resource for CoMP for

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		an SCC may be occupied and configured on the PCC. Individual mapping between a PDCCH through an SCC and a PUCCH resource reserved on the PCC for CoMP of the SCC may be performed based on a CCE index of a CoMP dependent DCI format carried by the PDCCH. Kim at Para. [0122]. Since a newly configured PUCCH resource for a specific TM (e.g. CoMP mode) may be targeted at another RX point (RP), all or a part of parameters associated with the RX point (e.g. a virtual cell ID indicating the corresponding RX point, scrambling ID, Δ^{PUCCH} shift, δ^{PUCCH} offset, β^{PUCCH}, $N^{(1)}_{\text{PUCCH}}$, etc.) may be previously interlinked to a corresponding state. Here, the virtual cell ID is a cell ID replacing a physical cell ID (e.g. $N^{\text{cell}}_{\text{ID}}$) or a cell ID allocated to a specific point separately from the physical cell ID and may be used to configure PUCCH resources for a corresponding cell together with or instead of the physical cell ID. Δ^{PUCCH} shift is a value corresponding to an interval between cyclic shifts applied to a PUCCH and is provided by a higher layer. δ^{PUCCH} offset corresponds to an offset value indicating the start location of separately configured PUCCH resources according to the present invention. β^{PUCCH} is an amplitude scaling value for a PUCCH and complex-valued symbols to be transmitted on the PUCCH are multiplied by β^{PUCCH} so as to suit a transmit power P_{PUCCH}. For example, when a specific parameter(s) is linked to a corresponding state by higher-layer (e.g. RRC) signaling, if the state is indicated by an ARI, the UE may be operated to perform PUCCH transmission by applying the pre-linked specific parameter(s). Kim at Para. [0125]. Meanwhile, dynamic PUCCH resources may be pre-divided into multiple resource regions according to usage and one of the resource regions may be selectively used according to DCI format or TM, or higher-layer signaling. For example, the eNB may configure two types of PUCCH resource regions (e.g. PUCCH resource region 1 and PUCCH resource region 2), previously signal the configured regions to the UE, and implicitly signal a PUCCH resource to be used by the UE out of the PUCCH resource region 1 and the PUCCH resource region 2 at a corresponding PUCCH transmission

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		timing to the UE using a CCE index of a DCI format for a DL grant. That is, the UE may be semi-statically assigned the allocated PUCCH resource region 1 and PUCCH resource region 2 and may determine a PUCCH resource to be used at a specific PUCCH transmission timing from the PUCCH resource region 1 or the PUCCH resource region 2 according to a CCE index of a PDCCH associated with the specific PUCCH transmission timing. For example, if it is predefined that an odd CCE index is connected to the PUCCH resource 1 and an even CCE index is connected to the PUCCH resource 2, the UE may determine in which PUCCH resource region of the PUCCH resource region 1 and the PUCCH resource region 2 a PUCCH resource is selected according to whether a CCE index obtained by decoding the DL grant is an odd number or an even number. Which individual PUCCH resource in a corresponding PUCCH resource region is to be used may be implicitly/dynamically determined by the CCE index. Assuming that a PUCCH resource related to CoMP is allocated to the PUCCH resource 2, the eNB can prevent a normal UE and a CoMP UE from transmitting ACK/NACK using the same PUCCH resource by mapping the DL grant of the CoMP UE to a CCE of an even index. As another example, CCE indexes 1 to 50 may be sequentially linked to the PUCCH resource region 1 and CCE indexes 51 to 100 may be sequentially linked to the PUCCH resource region 2. Assuming that the CoMP related PUCCH resource is allocated to the PUCCH resource region 2, the eNB can prevent the CoMP UE and the normal UE from transmitting ACK/NACK using the same PUCCH resource by mapping the DL grant of the CoMP UE to one or more CCEs among CCEs having the CCE indexes 51 to 100. Upon detecting any one value of the CCE indexes 51 to 100 as nCCE, the UE may be configured to select a PUCCH resource from the PUCCH resource region 2 and, upon detecting any one value of the CCE indexes 1 to 50 as nCCE, the UE may be configured to select a PUCCH resource from the PUCCH resource region 1. Kim at Para. [0133]. Meanwhile, a mode for dynamic switching/indication between RRC parameter sets may be enabled or disabled by higher-layer (e.g. RRC) signaling. For example, if the dynamic switching/indication mode is disabled by higher-layer signaling, a specific

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		RRC parameter set among the RRC parameter sets may be semi-statically configured. That is, if the dynamic switching/indication mode is disabled by higher-layer signaling, the aforementioned n bits may not be added or the n bits may be regarded as meaningless even when the n bits are added. In other words, the n bits indicating a specific RRC parameter among the RRC parameter sets may be regarded as meaningful only when the dynamic switching/indication mode is enabled. Kim at [0144]. If the dynamic switching/indication mode is disabled by higher-layer signaling, a set of specific RRC parameters (e.g. a virtual cell ID (e.g. $VCID^{BSI}$) for determining a base sequence index (BSI) and another independent virtual cell ID (e.g. $VCID^{CSH}$) for initializing a cyclic shift hopping (CSH) pattern) may be semi-statically configured even with respect to a CoMP mode according to a predetermined rule. A PUCCH may include not only a virtual cell ID for generating a PUCCH sequence but also a parameter(s) (e.g. Δ^{PUCCH} shift, δ^{PUCCH} offset, β_{PUCCH}, $N^{(1)}_{PUCCH}$, etc.) related to the virtual cell ID, in a specific RRC parameter set. An SRS related parameter may also be included in the specific RRC parameter set. For example, not only the virtual cell ID for generating the SRS sequence but also parameters related to the virtual cell ID may be included in the specific RRC parameter set. Kim at Para. [0145]. In a 3GPP LTE system, the UE is configured to blind-decode up to two DCI formats according to TM. In this case, the UE will basically perform blind decoding with respect to a fallback DCI format (e.g. DCI format 1A) and a TM dependent DCI format. According to the present invention, upon detecting a DCI format designated to achieve a special purpose such as CoMP or a newly introduced DCI format, the UE performs a pre-designated operation. A cell selection parameter(s) indicating towards which RX point the UE is to perform UL transmission, to which target cell the UE is to perform UL transmission, and which cell ID the UE uses during UL transmission may be pre-designated. In addition, selection of a PUSCH transmission parameter(s) indicating which PUSCH DMRS the UE is to use, selection of an SRS transmission parameter(s)

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		indicating which sequence or RB is used to transmit an SRS, and selection of a PUCCH transmission parameter(s) indicating which resource (CS/OCC, RB, hopping, and cell ID) are used by a PUCCH may be pre-designated. A parameter set may be pre-configured and the UE may be configured to use the designated parameter set according to DCI format. Here, the eNB may pre-designate a plurality of parameter sets to the UE by higher-layer (e.g. RRC) signaling and may cause the UE to select one or some of the plural parameter sets so as to be used for UL transmission. If the multiple parameter sets are configured by higher-layer signaling, the UE may be configured to use a parameter set linked to specific DCI upon detecting the specific DCI. If the number of DCI formats for the plural parameter sets is one, the UE may be configured to select one of the plural parameter sets using additional information included in the DCI format. That is, according to DCI format, parameter sets reserved for the corresponding DCI format are determined and an actually used parameter set for transmission among the reserved parameter sets may be dynamically indicated to the UE by DCI transmitted through a PDCCH. Information indicating a parameter set to be applied to actual UL transmission among the reserved parameter sets may be transmitted to the UE from the eNB by reusing a CIF introduced for carrier aggregation. In carrier aggregation, the CIF is used to indicate for which CC scheduling information is carried by the corresponding DCI. The CIF may be used to indicate a parameter set instead of indicating a CC. If the CIF is used to indicate the parameter set rather than the CC, the CIF may be used as an enable signal. For example, if a DCI format for CoMP is a DCI format X, when CoMP is configured, PUCCH resources associated with the DCI format X may be pre-reserved and parameters associated with the DCI format X may also be pre-configured. However, the PUCCH resources and parameters associated with the DCI format X are only reserved without being actually used and when the DCI format X is detected by the UE, the reserved PUCCH resources and parameters are used. That is, it may be interpreted that the reserved PUCCH resources or parameters are enabled by an additional field of DCI such as a CIF together with the DCI format X. A PUCCH resource region may be implicitly determined according to a subframe instead of the CIF. For example, when subframes in which many PUCCH resources for CoMP are reserved are periodically configured, if the eNB informs the UE of the start location and configuration period of

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		the subframes in which many PUCCH resources for CoMP are reserved, the UE may use a PUCCH resource for CoMP in subframes of the corresponding period and use a conventional PUCCH resource in the other subframes. Kim at Para. [0170]. A dynamic switching/indication mode between pre-reserved parameter sets or a dynamic switching/indication mode between pre-reserved PUCCH resource regions may be indicated through higher-layer (e.g. RRC) signaling. For example, when the dynamic switching/indication mode is disabled by higher-layer signaling, a parameter set and a PUCCH resource region for a specific TM (e.g. CoMP mode) may be semi-statically configured and the UE may perform UL transmission using the parameter set and/or PUCCH resource region. Meanwhile, when only one parameter set is UE-specifically configured, the UE may regard this as a semi-static mode and may be configured to perform UL transmission by applying the corresponding parameter set. When a plurality of RRC parameter sets is UE-specifically configured, the UE may recognize that dynamic switching should be performed between the plural parameter sets and may be configured to perform an operation according to dynamic switching. Kim at Para. [0173]. Meanwhile, the eNB processor may pre-divide dynamic PUCCH resources into multiple resource regions according to usage. For instance, one PUCCH resource region among the multiple resource regions may be selected and used according to DCI format or TM, or higher-layer signaling. For example, it may be pre-defined that a set of some CCE indexes is connected to a PUCCH resource region 1 and a set of the other CCE indexes is connected to a PUCCH resource region 2. The UE processor may determine in which PUCCH resource region of the PUCCH resource region 1 and the PUCCH resource region 2 a PUCCH resource is selected according to a set of CCE indexes to which a CCE index obtained by decoding a DL grant belongs. The UE processor may implicitly/dynamically determine which individual PUCCH resource in a corresponding PUCCH resource region is to be used based on a CCE index. The eNB processor can prevent ACK/NACK for a DL grant of a CoMP UE and ACK/NACK for a DL grant of

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		a normal UE from being transmitted using the same PUCCH resource, by allocating the DL grant of the CoMP UE and the DL grant of the normal UE to CCEs linked to different PUCCH resource regions. Kim at Para. [0190]. Meanwhile, the eNB processor may enable/disable a dynamic switching/indication mode between the plural RRC parameter sets by higher-layer (e.g. RRC) signaling. If the dynamic switching/indication mode is disabled by higher-layer signaling, a set of specific RRC parameters (e.g. a virtual cell ID (e.g. $VCID^{BSI}$) for determining a BSI and another independent virtual cell ID (e.g. $VCID^{CSH}$) for initializing a CSH pattern) may be semi-statically configured even with respect to a CoMP mode according to a predefined rule. Kim at Para. [0196]. Meanwhile, upon detecting the DCI format, the UE processor may control the UE RF unit and/or the UE memory to perform a pre-designated operation. A cell selection parameter(s) indicating towards which RX point the UE RF unit is to perform UL transmission, to which target cell the UE RF unit is to perform UL transmission, and which cell ID the UE uses during UL transmission may be pre-designated. In addition, selection of a PUSCH transmission parameter(s) indicating which PUSCH DMRS the UE processor is to use, selection of an SRS transmission parameter(s) indicating which sequence or RB is used to transmit an SRS, and selection of a PUCCH transmission parameter(s) indicating which resource (CS/OCC, RB, hopping, and cell ID) a PUCCH is to use may be pre-designated. A parameter set may be pre-configured by the eNB processor and information about the configured parameter set may be transmitted to the UE by the eNB RF unit. The UE processor may be configured to use the designated parameter set according to DCI format. The eNB processor may pre-designate a plurality of parameter sets and configure the information about the configured parameter set as a higher-layer signal. The eNB processor may control the eNB RF unit to transmit the higher-layer signal. The UE RF unit may receive the higher-layer signal and transmit the received higher-layer signal to the UE processor. The UE processor may select one

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		or some of the plural parameter sets to be used for UL transmission. Upon detecting specific DCI, the UE processor may be configured to use a specific parameter set linked to the specific DCI. If the number of DCI formats for the plural parameter sets is one, the UE processor may be configured to select one of the plural parameter sets using additional information included in the DCI format. The eNB processor may control the eNB RF unit to transmit information about a parameter set that the UE desires to use for actual transmission among the parameter sets reserved by the eNB for the specific DCI format to the UE through a PDCCH. For instance, the eNB processor may use a CIF to indicate one of the plural parameter sets. Kim at Para. [0187]. The 128 Application supports these disclosures. <i>See</i> 128 Application at 17 of 22, Figure 3-(a), Drawing 3-(b). PCT 493 supports these disclosures. <i>See</i> PCT 493 at [152], [162], [188], [191], [205], [208], [214], Fig. 9, Fig. 1, Fig. 11, Fig. 12. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
1[h]	wherein the start offset information on the resource allocated to the uplink control channel is	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information on the resource allocated to the uplink control channel is determined based on a coverage level. For example, Kim discloses this limitation based on the following exemplary citations:

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	determined based on a coverage level; and	With appearance and spread of machine-to-machine (M2M) communication and a variety of devices such as smartphones and tablet PCs and technology demanding a large amount of data transmission, data throughput needed in a cellular network has rapidly increased. To satisfy such rapidly increasing data throughput, carrier aggregation technology, cognitive radio technology, etc. for efficiently employing more frequency bands and multiple input multiple output (MIMO) technology, multi-eNB cooperation technology, etc. for raising data capacity transmitted on limited frequency resources have been developed. In addition, a communication environment has evolved into increasing density of nodes accessible by a user equipment (UE) at the periphery of the nodes. A node refers to a fixed point capable of transmitting/receiving a radio signal to/from a UE through one or more antennas. A communication system including high-density nodes may provide a better communication service to the UE through cooperation between the nodes. Kim at Para. [0002]. In the present invention, a node refers to a fixed point capable of transmitting/receiving a radio signal through communication with a UE. Various types of BSs may be used as nodes irrespective of the terms thereof. For example, a BS, a node B (NB), an e-node B (eNB), a pico-cell eNB (PeNB), a home eNB (HeNB), a relay, a repeater, etc. may be a node. In addition, a node may not be an eNB. For example, a radio remote head (RRH) or a radio remote unit (RRU) may be a node. The RRH or RRU generally has a lower power level than a power level of an eNB. Since the RRH or RRU (hereinafter, an RRH/RRU) is generally connected to the eNB through a dedicated line such as an optical cable, cooperative communication between RRH/RRU and the eNB can be smoothly performed in comparison with cooperative communication between eNBs connected by a radio line. At least one antenna is installed per node. The antenna may mean a physical antenna or mean an antenna port, a virtual antenna, or an antenna group. A node may be referred to as a point. Unlike a conventional centralized antenna system (CAS) (i.e. a single-node system) including antennas which converge upon an eNB and are controlled by one eNB controller, a multi-node system includes a plurality

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		of nodes separated from one another by a predetermined distance or more. The plural nodes may be managed by one or more eNBs or eNB controllers for controlling operation thereof or scheduling data transmission/reception therethrough. Each node may be connected to an eNB or eNB controller for managing the node through a cable or a dedicated line. In the multi-node system, the same cell identifier (ID) or different cell IDs may be used to transmit/receive signals to/from a plurality of nodes. If the plural nodes have the same cell ID, each of the nodes operates as a partial antenna group of one cell. If the nodes have different cell IDs in the multi-node system, the multi-node system may be regarded as a multi-cell (e.g. a macro-cell/femto-cell/pico-cell) system. If multiple cells formed respectively by multiple nodes are configured in an overlaid form according to coverage, a network formed by the multiple cells is referred to as a multi-tier network. A cell ID of an RRH/RRU may be the same as or different from a cell ID of an eNB. When the RRH/RRU and the eNB use different cell IDs, both the RRH/RRU and the eNB operate as independent eNBs. Kim at [0042]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and

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		operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097]. The diagram illustrates the mapping between Control Channel Elements (CCEs) and Physical Uplink Control Channel (PUCCH) resources. At the top, a horizontal sequence of boxes represents CCEs, indexed from n-1 to n+3. A label 'One CCE' points to box n, and 'CCE index' points to the index n. Below this sequence, a vertical stack of boxes represents the PDCCH structure: PDCCH(L=2), DCI format A (labeled as 'Fallback DCI'), and DCI format B (labeled as 'TM dependent DCI'). Below the PDCCH stack, a horizontal sequence of boxes represents PUCCH resources, indexed from m-1 to m+3. Two dashed arrows, labeled 'n-to-m linkage (dynamic CCE-to-AN mapping)', show the mapping from CCE n to PUCCH resource m. One arrow originates from the PDCCH stack and points to resource m, while the other originates from the CCE sequence and points to resource m. A label 'PUCCH resource index' points to the index m. Kim at FIG. 6. The present invention proposes configuring additional dynamic PUCCH resources separately from conventional dynamic PUCCH resources. In other words, the present invention proposes UE-specifically, UE group-specifically, or TM-specifically configuring a set of additional dynamic PUCCH resources separately from a set of cell-specifically configured conventional dynamic PUCCH resources. For example, an eNB may configure the additional dynamic PUCCH resources by transmitting a UE-specific, UE group-specific, or TM-specific PUCCH resource index offset value to a UE separately from a cell-specifically provided PUCCH resource index offset value (e.g. N(1) PUCCH). Kim at Para. [0102].

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		For reference, the term cell used in CA is different from the term cell indicating a predetermined geographical area to which a communication service is provided by one eNB or one antenna group. A DL signal of a specific cell referring to coverage of a communication service indicates a signal that an eNB or antenna group of the specific cell transmits to a UE and a UL signal of the specific cell indicates a signal that the UE transmits to the eNB or antenna group of the specific cell. In contrast, a DL/UL signal of a cell of CA indicates a radio signal transmitted/received using resources constituting the corresponding cell. To distinguish a cell indicating a predetermined geographical area from a cell of CA, embodiments of the present invention will be described hereinbelow by referring to the cell of CA as a CC and the cell of the geographical area as a cell. Kim at Para. [0112]. In each aspect of the present invention, each of the parameter sets may include at least one of a cell identifier for determining a base sequence index, a cell identifier for initializing a cyclic shift hopping pattern, and a physical uplink control channel (PUCCH) resource index offset. Kim at Para. [0019]. In each aspect of the present invention, the information indicating the specific parameter set may correspond to n bits added to a downlink control information (DCI) format. Kim at Para. [0020]. PUCCH resources are configured based on a cell ID. A UE acquires an ID of a cell accessed thereby and configures PUCCH resources for PUCCH transmission in the cell, that is, PUCCH transmission to a node of the cell, based on the cell ID. The PUCCH resources configured based on one cell ID include PUCCH resources for transmission of CSI, PUCCH resources for transmission of semi-persistent scheduling (SPS) ACK/NACK and SR, and PUCCH resources for transmission of dynamic ACK/NACK (i.e. dynamically allocated PUCCH resources linked with a PDCCH). In a 3GPP

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		LTE/LTE-A system, PUCCH resources for transmission of CSI, SPS ACK/NACK, SR, etc. are semi-statically reserved explicitly for the UE by a higher-layer signal. Hereinafter, for ACK/NACK transmission, a PUCCH resource dynamically determined in association with a PDCCH is especially referred to as a dynamic PUCCH resource or an implicit PUCCH resource, and a PUCCH resource explicitly configured by a higher-layer signal is referred to as a semi-static PUCCH resource or an explicit PUCCH resource. In addition, a PUCCH resource for CSI transmission is referred to as a CSI PUCCH resource or a CSI resource, a PUCCH resource for SPS ACK/NACK transmission is referred to as an SPS ACK/NACK PUCCH resource or an SPS ACK/NACK resource, a PUCCH resource for SR transmission is referred to as an SR PUCCH resource or an SR resource, and a PUCCH resource for ACK/NACK transmission associated with a PDCCH is referred to as an ACK/NACK PUCCH resource or an ACK/NACK resource. Kim at Para. [0092]. Referring to FIG. 5, PUCCH resources based on one cell ID are arranged in order of CSI PUCCH resources, SPS ACK/NACK and SR PUCCH resources, and dynamic ACK/NACK PUCCH resources in the direction of a DC subcarrier (i.e. a subcarrier mapped to f_0 in a frequency up-conversion procedure) from subcarriers distant from the DC subcarrier. In other words, semi-statically configured PUCCH resources through higher-layer signaling are located at an outer side of UL transmission bandwidth and dynamically configured ACK/NACK PUCCH resources are located nearer a center frequency than the semi-statically configured PUCCH resources. In this case, as a PUCCH resource approaches the center frequency, a PUCCH resource index increases. Namely, the index of a PUCCH resource allocated to a PRB near the center frequency is larger than the index of a PUCCH resource allocated to a PRB distant from the center frequency. A plurality of PUCCH resources in the same PRB is indexed based on an orthogonal sequence and/or a cyclic shift. Kim at Para. [0093].

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		Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098]. UL DPS entails an operation of frequently changing target RX points of UL transmission. If a target RX point has a cell ID different from a conventional cell ID, PUCCH and PUSCH transmission suitable for a changed target cell should be performed. Since a resource linked to a cell ID is allocated for PUCCH transmission, the UE needs to differently generate a PUCCH resource depending on to which point a PUCCH is transmitted. Accordingly, the UE should be configured to generate the PUCCH resource according to a cell ID of a target RX point to which the PUCCH is transmitted. Meanwhile, since path loss differs according to the target RX point, it is desirable to differently set a power control offset according to the target RX point. Therefore, the present invention proposes controlling UL power per RX point. Assuming that a set of points that the UE can dynamically select is a DPS set, the UE should know, for example, a PUCCH/PUSCH/SRS power control offset per cell ID

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		included in the DPS set and determine a power control offset of any channel of any cell every UL transmission time point, thereby applying the determined power control offset to UL transmission to a corresponding cell. The eNB may pre-configure a plurality of power control offsets to signal the configured offsets to the UE and dynamically or explicitly indicate a power control offset among the plural power control offsets so that the UE may perform UL transmission by applying the power control offset. Alternatively, the UE may select one of the plural power control offsets according to a predetermined condition so that the selected power control offset may be applied to UL transmission. Upon detecting CoMP dependent DCI, the UE may be configured to apply such an operation to a PUCCH resource reserved for CoMP. Referring to FIG. 10, the PUCCH resource reserved for CoMP may be reserved by a PUCCH resource index offset (K or L) for a conventional dynamic PUCCH resource in terms of one cell. Furthermore, when UL DPS is performed, a PUCCH resource index offset may be configured per a plurality of target RX points. Kim at [0163]. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 13-14 of 22, 16 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [5], [124], [140]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

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1[i]	wherein when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted.	At least under Pegasus's apparent infringement theory, Kim discloses when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted. For example, Kim discloses this limitation based on the following exemplary citations: A communication scheme capable of transmitting/receiving a signal through a plurality of transmission (TX)/reception (RX) nodes, transmitting/receiving a signal through at least one node selected from among a plurality of TX/RX nodes, or differentiating a node transmitting a downlink signal from a node receiving an uplink signal is referred to as multi-eNB MIMO or coordinated multi-point TX/RX (CoMP). A coordinated transmission scheme of such coordinated communication between nodes may be classified largely into joint processing (JP) and scheduling coordination (CB). The JP scheme may further be divided into joint transmission (JT) and dynamic point selection (DPS) and the CB scheme may further be divided into coordinated scheduling (CS) and coordinated beamforming (CB). DPS may also be called dynamic cell selection (DCS). When JP is performed compared with other communication schemes among coordination communication schemes between nodes, a wider variety of communication environments may be formed. JT of the JP scheme is a communication scheme for transmitting the same stream to a UE from a plurality of nodes. The UE restores the stream by combining signals received from the plural nodes. JT can improve reliability of signal transmission using transmit diversity because the same stream is transmitted by plural nodes. DPS of the JP scheme is a communication scheme for transmitting/receiving a signal through one node selected according to a specific rule from among a plurality of nodes. In DPS, since a node having a good channel state with a UE will typically be selected as a communication node, reliability of signal transmission can be improved. Kim at Para. [0044]. A DL subframe is divided into a control region and a data region in a time domain. Referring to FIG. 3, a maximum of 3 (or 4) OFDM symbols located in a front part of a

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		first slot of a subframe correspond to the control region. Hereinafter, a resource region for PDCCH transmission in a DL subframe is referred to as a PDCCH region. OFDM symbols other than the OFDM symbol(s) used in the control region correspond to the data region to which a physical downlink shared channel (PDSCH) is allocated. Hereinafter, a resource region available for PDSCH transmission in the DL subframe is referred to as a PDSCH region. Examples of a DL control channel used in 3GPP LTE include a physical control format indicator channel (PCFICH), a physical downlink control channel (PDCCH), a physical hybrid ARQ indicator channel (PHICH), etc. The PCFICH is transmitted in the first OFDM symbol of a subframe and carries information about the number of OFDM symbols available for transmission of a control channel within a subframe. The PHICH carries a HARQ (Hybrid Automatic Repeat Request) ACK/NACK (acknowledgment/negative-acknowledgment) signal as a response to UL transmission. Kim at Para. [0058]. The PUCCH may be used to transmit the following control information. Scheduling request (SR): SR is information used to request a UL-SCH resource and is transmitted using an on-off keying (OOK) scheme. HARQ-ACK: HARQ-ACK is a response to a PDCCH and/or a response to a DL data packet (e.g. a codeword) on a PDSCH. HARQ-ACK indicates whether the PDCCH or PDSCH has been successfully received. 1-bit HARQ-ACK is transmitted in response to a single DL codeword and 2-bit HARQ-ACK is transmitted in response to two DL codewords. A HARQ-ACK response includes a positive ACK (simply, ACK), negative ACK (NACK), discontinuous transmission (DTX), or NACK/DRX. HARQ-ACK is used interchangeably with HARQ ACK/NACK and ACK/NACK. Channel state information (CSI): CSI is feedback information for a DL channel. MIMO-related feedback information includes a rank indicator (RI) and a precoding matrix indicator (PMI). Kim at Paras. [0078]-[0081].

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		Referring to Equation 2, PUCCH resources for ACK/NACK are not pre-allocated to each UE and a plurality of UEs in a cell dividedly uses a plurality of PUCCH resources at each time point. Specifically, PUCCH resources used by the UE to carry ACK/NACK are dynamically determined based on a PDCCH carrying scheduling information for a PDSCH carrying corresponding DL data. An entire region in which the PDCCH is transmitted in each DL subframe includes a plurality of CCEs and the PDCCH transmitted to the UE is composed of one or more CCEs. The UE transmits ACK/NACK through a PUCCH resource linked to a specific CCE (e.g. first CCE) among the CCEs constituting the PDCCH received thereby. Kim at Para. [0094]. Referring to FIG. 8, the UE may transmit UCI linked to a PDCCH to cell 1, which is the same as cell 1 in which the PDCCH is received, using a PUCCH resource determined according to the above-described embodiment of the present invention. Kim at Para. [0107]. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 14 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [60], [61], [85]-[88], [43]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

2. Claim 2

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2	The method of claim 1, wherein: at least one of the plurality of pieces of start offset information is applied according to a corresponding coverage level of the MTC terminal.	At least under Pegasus's apparent infringement theory, Kim discloses at least one of the plurality of pieces of start offset information is applied according to a corresponding coverage level of the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See every limitation of claim 1, limitation 1[h]</i> UL DPS entails an operation of frequently changing target RX points of UL transmission. If a target RX point has a cell ID different from a conventional cell ID, PUCCH and PUSCH transmission suitable for a changed target cell should be performed. Since a resource linked to a cell ID is allocated for PUCCH transmission, the UE needs to differently generate a PUCCH resource depending on to which point a PUCCH is transmitted. Accordingly, the UE should be configured to generate the PUCCH resource according to a cell ID of a target RX point to which the PUCCH is transmitted. Meanwhile, since path loss differs according to the target RX point, it is desirable to differently set a power control offset according to the target RX point. Therefore, the present invention proposes controlling UL power per RX point. Assuming that a set of points that the UE can dynamically select is a DPS set, the UE should know, for example, a PUCCH/PUSCH/SRS power control offset per cell ID included in the DPS set and determine a power control offset of any channel of any cell every UL transmission time point, thereby applying the determined power control offset to UL transmission to a corresponding cell. The eNB may pre-configure a plurality of power control offsets to signal the configured offsets to the UE and dynamically or explicitly indicate a power control offset among the plural power control offsets so that the UE may perform UL transmission by applying the power control offset. Alternatively, the UE may select one of the plural power control offsets according to a predetermined condition so that the selected power control offset may be applied to UL transmission. Upon detecting CoMP dependent DCI, the UE may be configured to apply such an operation to a PUCCH resource reserved for

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		CoMP. Referring to FIG. 10, the PUCCH resource reserved for CoMP may be reserved by a PUCCH resource index offset (K or L) for a conventional dynamic PUCCH resource in terms of one cell. Furthermore, when UL DPS is performed, a PUCCH resource index offset may be configured per a plurality of target RX points. Kim at [0163]. In the present invention, a node refers to a fixed point capable of transmitting/receiving a radio signal through communication with a UE. Various types of BSs may be used as nodes irrespective of the terms thereof. For example, a BS, a node B (NB), an e-node B (eNB), a pico-cell eNB (PeNB), a home eNB (HeNB), a relay, a repeater, etc. may be a node. In addition, a node may not be an eNB. For example, a radio remote head (RRH) or a radio remote unit (RRU) may be a node. The RRH or RRU generally has a lower power level than a power level of an eNB. Since the RRH or RRU (hereinafter, an RRH/RRU) is generally connected to the eNB through a dedicated line such as an optical cable, cooperative communication between RRH/RRU and the eNB can be smoothly performed in comparison with cooperative communication between eNBs connected by a radio line. At least one antenna is installed per node. The antenna may mean a physical antenna or mean an antenna port, a virtual antenna, or an antenna group. A node may be referred to as a point. Unlike a conventional centralized antenna system (CAS) (i.e. a single-node system) including antennas which converge upon an eNB and are controlled by one eNB controller, a multi-node system includes a plurality of nodes separated from one another by a predetermined distance or more. The plural nodes may be managed by one or more eNBs or eNB controllers for controlling operation thereof or scheduling data transmission/reception therethrough. Each node may be connected to an eNB or eNB controller for managing the node through a cable or a dedicated line. In the multi-node system, the same cell identifier (ID) or different cell IDs may be used to transmit/receive signals to/from a plurality of nodes. If the plural nodes have the same cell ID, each of the nodes operates as a partial antenna group of one cell. If the nodes have different cell IDs in the multi-node system, the multi-node system may be regarded as a multi-cell (e.g. a macro-cell/femto-cell/pico-cell)

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		system. If multiple cells formed respectively by multiple nodes are configured in an overlaid form according to coverage, a network formed by the multiple cells is referred to as a multi-tier network. A cell ID of an RRH/RRU may be the same as or different from a cell ID of an eNB. When the RRH/RRU and the eNB use different cell IDs, both the RRH/RRU and the eNB operate as independent eNBs. Kim at [0042]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097].

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		The diagram illustrates the mapping of Control Channel Elements (CCEs) to Antenna Numbers (ANs). At the top, a sequence of CCEs is shown as boxes labeled n-1, n, n+1, n+2, and n+3, with ellipses on either side. An arrow labeled 'One CCE' points to box n, and an arrow labeled 'CCE index' points to the label 'n'. Below this sequence, a vertical stack of four boxes represents the DCI structure: 'PDCCH(L=2)', 'DCI format A' (labeled 'Fallback DCI'), 'DCI format B' (labeled 'TM dependent DCI'), and another 'DCI format B'. Two dashed arrows, both labeled 'n-to-m linkage (dynamic CCE-to-AN mapping)', originate from the 'DCI format B' boxes and point to a sequence of ANs at the bottom, labeled m-1, m, m+1, m+2, and m+3, with ellipses on either side. An arrow labeled 'PUCCH resource index' points to the 'm-1' box in the AN sequence. Kim at FIG. 6. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 13-14 of 22, 16 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [5], [124], [140]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same

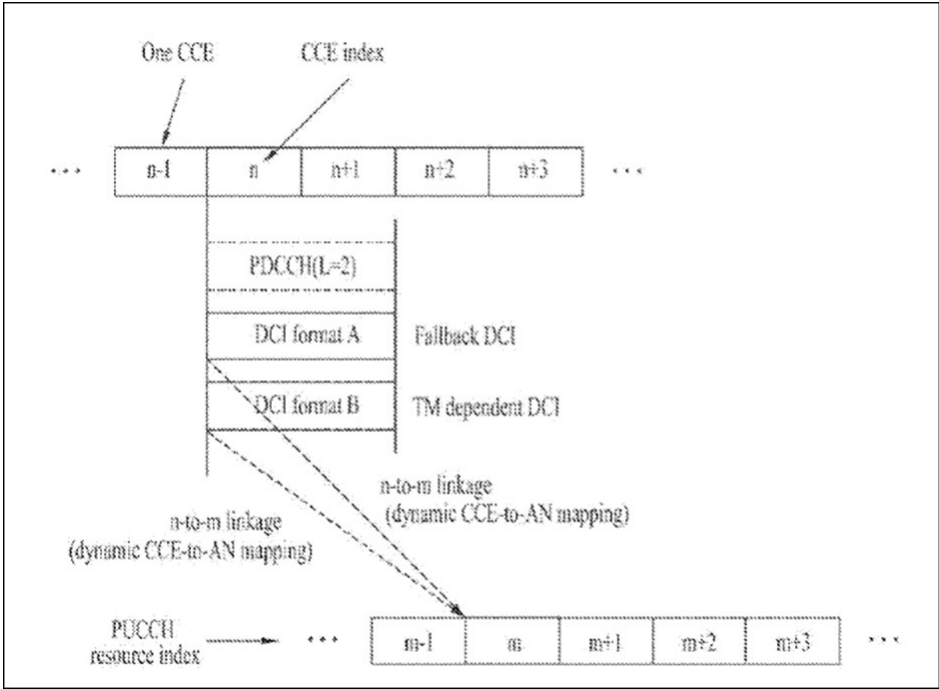
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		field of endeavor to address the same known problems, according to known methods which would yield predictable results.

3. Claim 3

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3[pre]	A method of configuring a resource of response information of downlink data for a Machine Type Communication (MTC) terminal in a base station, the method comprising:	To the extent the preamble is limiting, at least under Pegasus's apparent infringement theory, Kim discloses a method of configuring a resource of response information of downlink data for a Machine Type Communication (MTC) terminal in a base station. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[pre]; Kim at Abstract, Paras. [0002], [0007], [0010], [0038], [0033]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. As another aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting downlink control information to the user equipment through a physical downlink control channel (PDCCH); and receiving acknowledgement/negative acknowledgement

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		(ACK/NACK) information associated with the downlink control information from the user equipment, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is received using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$” where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0011]. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 15 of 22, Fig. 2-(b), 13 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [41]-[42], [141], [145], [152]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
3[a]	transmitting structural information that contains at least one of i) information on a resource allocated to an uplink control channel for	At least under Pegasus’s apparent infringement theory, Kim discloses transmitting structural information that contains at least one of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations:

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	transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel;	<i>See claim limitation 1[a]; Kim at Paras. [0018], [0020], [0059], [0069]; [0164]; Kim at claim 13.</i> Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098].

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		 Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

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3[b]	transmitting downlink control information for scheduling the downlink data; and	At least under Pegasus's apparent infringement theory, Kim discloses transmitting downlink control information for scheduling the downlink data. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[b]; Kim at Paras.[0010], [0018], [0068]. Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 (L=2) on CCEs n and n+1. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098].

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		The diagram illustrates the mapping from a Control Channel Element (CCE) to an Antenna Port (AN). At the top, a horizontal sequence of boxes represents CCEs, indexed from n-1 to n+3. An arrow points to box n, labeled 'One CCE', and another points to the index 'n', labeled 'CCE index'. Below this sequence, a vertical stack of boxes represents the CCE's contents: 'PDCCH(L=2)', 'DCI format A' (labeled 'Fallback DCI'), and 'DCI format B' (labeled 'TM dependent DCI'). Two dashed arrows, each labeled 'n-to-m linkage (dynamic CCE-to-AN mapping)', originate from the bottom of the DCI format boxes and point to a horizontal sequence of boxes at the bottom, indexed from m-1 to m+3. An arrow points to the 'm' box, labeled 'PUCCH resource index'. Ellipses (...) are used at both ends of the CCE and PUCCH resource index sequences. Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

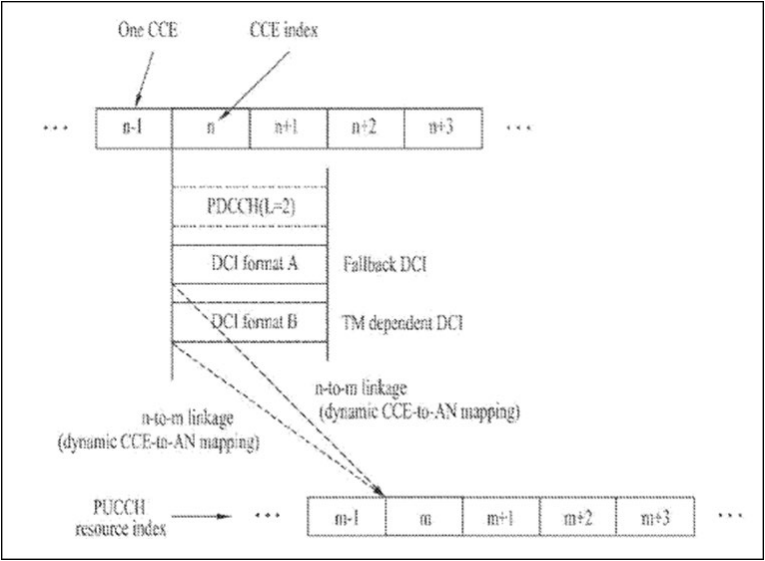
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3[c]	transmitting the downlink data,	At least under Pegasus’s apparent infringement theory, Kim discloses transmitting the downlink data. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[c]; Kim at Paras. [0018], [0059], [0066], [0098], [0110]; FIG. 6; Table 6. The eNB may transmit data to a UE or UE group in the data region. Data transmitted in the data region is referred to as user data. A PDSCH may be allocated to the data region for user data transmission. The PCH and the DL-SCH are transmitted on the PDSCH. A UE may decode control information received on a PDCCH and thus read data received on the PDSCH. The size and usage of DCI transmitted on one PDCCH may vary according to DCI format and the size of the DCI may vary according to coding rate. Information indicating to which UE or UE group PDSCH data is transmitted and information indicating how the UE or UE group should receive and decode the PDSCH data are transmitted on the PDCCH. For example, it is assumed that a specific PDCCH is CRC-masked with a radio network temporary identity (RNTI) ‘A’ and information about data transmitted using a radio resource ‘B’ (e.g. frequency location) and using transport format information ‘C’ (e.g. transmission block size, modulation scheme, coding information, etc.) is transmitted in a specific DL subframe. Then, the UE monitors the PDCCH using RNTI information thereof. The UE having the RNTI ‘A’ receives the PDCCH and receives the PDSCH indicated by ‘B’ and ‘C’ through information of the received PDCCH. Kim at Para. [0069]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art

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		references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
3[d]	wherein the resource of the uplink control channel for transmitting the response information of the downlink data is determined based on at least one piece of information on i) a resource of a downlink control channel for scheduling the downlink data; ii) the information on the resource allocated to the uplink control channel; and iii) the start offset information on the resource allocated to the uplink control channel;	At least under Pegasus's apparent infringement theory, Kim discloses the resource of the uplink control channel for transmitting the response information of the downlink data is determined based on at least one piece of information on i) a resource of a downlink control channel for scheduling the downlink data; ii) the information on the resource allocated to the uplink control channel; and iii) the start offset information on the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[e]; Kim at Paras. [0017], [0018], [0085], [0015], [0092], [0098], FIGS. 7, 8, 9, 10, 12. As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on "[Equation 1] $n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$" where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010].

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		To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
3[e]	wherein the start offset information of the resource allocated to the uplink control channel is configured separated from offset information on a terminal different from the MTC terminal;	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information of the resource allocated to the uplink control channel is configured separated from offset information on a terminal different from the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[f]; Kim at Paras. [0002], [0097], [0102], FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
3[f]	wherein a plurality of pieces of start offset information on the resource allocated to the uplink	At least under Pegasus's apparent infringement theory, Kim discloses a plurality of pieces of start offset information on the resource allocated to the uplink control channel are provided, and the plurality of pieces of start offset information are

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	control channel are provided, and the plurality of pieces of start offset information are transmitted through cell-specific high layer signaling for the MTC terminal to the MTC terminal;	transmitted through cell-specific high layer signaling for the MTC terminal to the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[g]; Kim at Paras. [0021], [0045], [0066], [0072], [0075]; [0076], [0085], [0088], [0092], [0082], [0089], [0090], [0093], [0094], [0098], [0099], [0100], [0102], [0103], [0104], [0105] [0106], [0114], [0144], [0122], [0125], [0133], [0144], [0145], [0170], [0173], [0190], [0196], [0187]; FIGS. 5, 7, 8, 9, 10, 12. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

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3[g]	wherein the start offset information on the resource allocated to the uplink control channel is determined based on a coverage level; and	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information on the resource allocated to the uplink control channel is determined based on a coverage level. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[h]; Kim at Paras. [0002], [0042], [0102], [0112], [0019], [0020], [0092], [0093], [0098]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097].

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		 Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
3[h]	wherein when the response information of the downlink data of the MTC terminal is	At least under Pegasus's apparent infringement theory, Kim discloses when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the repeated transmission is performed using a same uplink control

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	repeatedly transmitted, the repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted.	channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[i], Kim at Paras. [0055], [0058]; [0094], [0107]. The PUCCH may be used to transmit the following control information. Scheduling request (SR): SR is information used to request a UL-SCH resource and is transmitted using an on-off keying (OOK) scheme. HARQ-ACK: HARQ-ACK is a response to a PDCCH and/or a response to a DL data packet (e.g. a codeword) on a PDSCH. HARQ-ACK indicates whether the PDCCH or PDSCH has been successfully received. 1-bit HARQ-ACK is transmitted in response to a single DL codeword and 2-bit HARQ-ACK is transmitted in response to two DL codewords. A HARQ-ACK response includes a positive ACK (simply, ACK), negative ACK (NACK), discontinuous transmission (DTX), or NACK/DRX. HARQ-ACK is used interchangeably with HARQ ACK/NACK and ACK/NACK. Channel state information (CSI): CSI is feedback information for a DL channel. MIMO-related feedback information includes a rank indicator (RI) and a precoding matrix indicator (PMI). Kim at Paras. [0078]-[0081]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same

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		field of endeavor to address the same known problems, according to known methods which would yield predictable results.

4. Claim 4

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4	The method of claim 3, wherein: at least one of the plurality of pieces of start offset information is applied according to a corresponding coverage level of the MTC terminal.	At least under Pegasus's apparent infringement theory, Kim discloses at least one of the plurality of pieces of start offset information is applied according to a corresponding coverage level of the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> every limitation of claim 3, claim 2, and claim limitation 1[h]; Kim at [0163], [0042], [0097]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

5. Claim 5

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5[pre]	A Machine Type Communication (MTC) terminal for transmitting response information of downlink data to a base station, the terminal comprising:	To the extent the preamble is limiting, at least under Pegasus’s apparent infringement theory, Kim discloses a Machine Type Communication (MTC) terminal for transmitting response information of downlink data to a base station. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[pre]; <i>See</i> Kim at Abstract, at Paras. [0002], [0007], [0017], [0018], [0038], [0033]. As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$” where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0010]. The 128 Application supports these disclosures. <i>See</i> 128 Application at page 12 of 22, 15 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [8], [41], Abstract.

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		To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[a]	a receiving unit configured to receive structural information that contains at least one piece of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource to which the uplink control channel is allocated,	At least under Pegasus's apparent infringement theory, Kim discloses a receiving unit configured to receive structural information that contains at least one piece of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource to which the uplink control channel is allocated, configured to receive downlink control information for scheduling the downlink data, and configured to receive the downlink data. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[a], 1[b], and 1[c]; Kim at Paras. [0017], [0059], [0098], [0164]; FIGS. 6 & 10; FIGS. 6 & 10. The eNB may transmit data to a UE or UE group in the data region. Data transmitted in the data region is referred to as user data. A PDSCH may be allocated to the data region for user data transmission. The PCH and the DL-SCH are transmitted on the PDSCH. A UE may decode control information received on a PDCCH and thus read data received on the PDSCH. The size and usage of DCI transmitted on one PDCCH may vary according to DCI format and the size of the DCI may vary according to coding rate. Information indicating to which UE or UE group PDSCH data is transmitted and information indicating how the UE or UE group should receive and decode the PDSCH data are transmitted on the PDCCH. For example, it is assumed that a specific PDCCH is CRC-masked with a radio network temporary identity (RNTI) 'A' and information

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		about data transmitted using a radio resource ‘B’ (e.g. frequency location) and using transport format information ‘C’ (e.g. transmission block size, modulation scheme, coding information, etc.) is transmitted in a specific DL subframe. Then, the UE monitors the PDCCH using RNTI information thereof. The UE having the RNTI ‘A’ receives the PDCCH and receives the PDSCH indicated by ‘B’ and ‘C’ through information of the received PDCCH. Kim at Para. [0069]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[b]	a controller configured to determine a resource allocated to the uplink control channel for transmitting the response information of the downlink data based on at least one of i) information on a resource of a downlink control channel for scheduling the downlink data, ii) the information on the resource allocated to the uplink control channel, and iii) the start offset information on the	At least under Pegasus’s apparent infringement theory, Kim discloses a controller configured to determine a resource allocated to the uplink control channel for transmitting the response information of the downlink data based on at least one of i) information on a resource of a downlink control channel for scheduling the downlink data, ii) the information on the resource allocated to the uplink control channel, and iii) the start offset information on the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[e]; Kim at Paras. [0017], [0085], [0015], [0092], [0088], [0098], [0105], [0093], [0164], [0101], [0103], [0128], [0130], [0162], [0163], [0038]; FIGS. 5, 7, 8, 9, 10, 12.

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resource allocated to the uplink control channel; and	Referring to Equation 2, PUCCH resources for ACK/NACK are not pre-allocated to each UE and a plurality of UEs in a cell dividedly uses a plurality of PUCCH resources at each time point. Specifically, PUCCH resources used by the UE to carry ACK/NACK are dynamically determined based on a PDCCH carrying scheduling information for a PDSCH carrying corresponding DL data. An entire region in which the PDCCH is transmitted in each DL subframe includes a plurality of CCEs and the PDCCH transmitted to the UE is composed of one or more CCEs. The UE transmits ACK/NACK through a PUCCH resource linked to a specific CCE (e.g. first CCE) among the CCEs constituting the PDCCH received thereby. Kim at Para. [0094]. $m = \begin{cases} N_{RB}^{(2)} & \text{if } n_{PUCCH}^{(1,p)} < c \cdot N_{cs}^{(1)} / \Delta_{shift}^{PUCCH} \\ \left\lceil \frac{n_{PUCCH}^{(1,p)} - c \cdot N_{cs}^{(1)} / \Delta_{shift}^{PUCCH}}{c \cdot N_{sc}^{RB} / \Delta_{shift}^{PUCCH}} \right\rceil + N_{RB}^{(2)} + \left\lceil \frac{N_{cs}^{(1)}}{8} \right\rceil & \text{otherwise} \end{cases} \quad \text{[Equation 2]}$ $c = \begin{cases} 3 & \text{normal cyclic prefix} \\ 2 & \text{extended cyclic prefix} \end{cases}$ Kim at Equation 2. As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1]

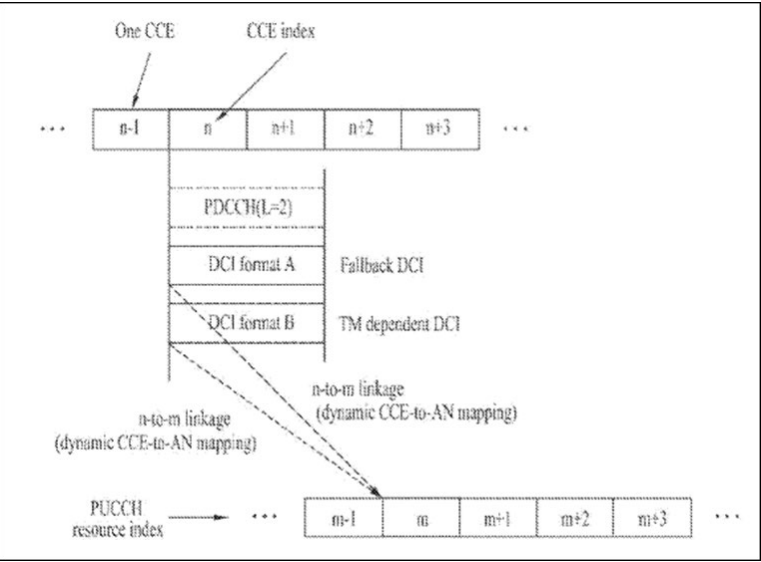
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		$n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$” where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[c]	a transmitting unit configured to transmit the response information of the downlink data by using the determined resource of the uplink control channel,	At least under Pegasus’s apparent infringement theory, Kim discloses a transmitting unit configured to transmit the response information of the downlink data by using the determined resource of the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[d]; Kim at Paras. [0014], [0015], [0017], [0018], [0092], [0094], [0088], [0094], [0098], [0105], [0109]; FIGS. 6, 7, and 8. As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission

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		mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$” where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010]. The PUCCH may be used to transmit the following control information. Scheduling request (SR): SR is information used to request a UL-SCH resource and is transmitted using an on-off keying (OOK) scheme. HARQ-ACK: HARQ-ACK is a response to a PDCCH and/or a response to a DL data packet (e.g. a codeword) on a PDSCH. HARQ-ACK indicates whether the PDCCH or PDSCH has been successfully received. 1-bit HARQ-ACK is transmitted in response to a single DL codeword and 2-bit HARQ-ACK is transmitted in response to two DL codewords. A HARQ-ACK response includes a positive ACK (simply, ACK), negative ACK (NACK), discontinuous transmission (DTX), or NACK/DRX. HARQ-ACK is used interchangeably with HARQ ACK/NACK and ACK/NACK. Channel state information (CSI): CSI is feedback information for a DL channel. MIMO-related feedback information includes a rank indicator (RI) and a precoding matrix indicator (PMI). Kim at Paras. [0078]-[0081]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success

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		because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[d]	wherein the start offset information of the resource allocated to the uplink control channel is configured separated from offset information on a terminal different from the MTC terminal;	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information of the resource allocated to the uplink control channel is configured separated from offset information on a terminal different from the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[f]; Kim at Paras. [0002]; [0097]; [0102]; FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[e]	wherein a plurality of pieces of start offset information on the resource allocated to the uplink control channel are provided, and the plurality of pieces of start offset information are received through cell-specific high layer signaling for the MTC terminal from the base station;	At least under Pegasus's apparent infringement theory, Kim discloses a plurality of pieces of start offset information on the resource allocated to the uplink control channel are provided, and the plurality of pieces of start offset information are received through cell-specific high layer signaling for the MTC terminal from the base station. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[g]; Kim at Paras. [0021], [0045], [0066], [0072], [0075]; [0076], [0085], [0088], [0092], [0082], [0089], [0090], [0093], [0094], [0098], [0099], [0100], [0102], [0103], [0104], [0105] [0106], [0114], [0144], [0122], [0125], [0133], [0144], [0145], [0170], [0173], [0190], [0196], [0187]; FIGS. 5, 7, 8, 9, 10, 12.

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		As still another aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving a higher-layer signal including a plurality of parameter sets from the base station; receiving information indicating a specific parameter set among the parameter sets from the base station through a physical downlink shared channel (PDSCH); and transmitting the uplink signal generated using a parameter in the specific parameter set to the base station. Kim at Para. [0017]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[f]	wherein the start offset information on the resource allocated to the uplink control channel is determined based on a coverage level; and	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information on the resource allocated to the uplink control channel is determined based on a coverage level. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> limitation 1[h]; Kim at Paras. [0002], [0042], [0102], [0112], [0019], [0020], [0092], [0093], [0098], [0163]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The

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		fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097].

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		 Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
5[g]	wherein when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the	At least under Pegasus's apparent infringement theory, Kim discloses when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly

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	repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted.	transmitted. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[i], Kim at Paras. [0055], [0058]; [0094], [0107]. The PUCCH may be used to transmit the following control information. Scheduling request (SR): SR is information used to request a UL-SCH resource and is transmitted using an on-off keying (OOK) scheme. HARQ-ACK: HARQ-ACK is a response to a PDCCH and/or a response to a DL data packet (e.g. a codeword) on a PDSCH. HARQ-ACK indicates whether the PDCCH or PDSCH has been successfully received. 1-bit HARQ-ACK is transmitted in response to a single DL codeword and 2-bit HARQ-ACK is transmitted in response to two DL codewords. A HARQ-ACK response includes a positive ACK (simply, ACK), negative ACK (NACK), discontinuous transmission (DTX), or NACK/DRX. HARQ-ACK is used interchangeably with HARQ ACK/NACK and ACK/NACK. Channel state information (CSI): CSI is feedback information for a DL channel. MIMO-related feedback information includes a rank indicator (RI) and a precoding matrix indicator (PMI). Kim at Paras. [0078]-[0081]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

6. Claim 6

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6	The MTC terminal of claim 5, wherein: at least one of the plurality of pieces of start offset information is applied according to a corresponding coverage level of the MTC terminal.	At least under Pegasus’s apparent infringement theory, Kim discloses at least one of the plurality of pieces of start offset information is applied according to a corresponding coverage level of the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> every limitation of claim 6, claim 2, and claim limitation 1[h]; Kim at [0163], [0042], [0097]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

7. Claim 7

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7[pre]	A base station for configuring a resource of response information of downlink data for a Machine Type Communication (MTC)	To the extent the preamble is limiting, at least under Pegasus’s apparent infringement theory, Kim discloses A base station for configuring a resource of response information of downlink data for a Machine Type Communication (MTC) terminal. For example, Kim discloses this limitation based on the following exemplary citations:

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	terminal, the base station comprising:	See claim limitation 1[pre] and 3[pre]; Kim at Abstract, Paras. [0002], [0007], [0010], [0038], [0033]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. As another aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting downlink control information to the user equipment through a physical downlink control channel (PDCCH); and receiving acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information from the user equipment, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is received using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{PUCCH} = f(n_{CCE}, N^{(1)}_{PUCCH}, X)$” where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0011].

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		The 128 Application supports these disclosures. <i>See</i> 128 Application at page 15 of 22, Fig. 2-(b), 13 of 22. PCT 493 supports these disclosures. <i>See</i> PCT 493 at [41]-[42], [141], [145], [152]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
7[a]	a transmitting unit configured to transmit structural information, downlink control information for scheduling the downlink data, and the downlink data,	At least under Pegasus's apparent infringement theory, Kim discloses a transmitting unit configured to transmit structural information, downlink control information for scheduling the downlink data, and the downlink data. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[a], 1[b], 1[c], 3[a], 3[b], 3[c]; Kim at Paras. [0020], [0059], [0069]; [0164], [0068]; 0066], [0098], [0110]. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment.

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		Kim at Para. [0018]. As another aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting downlink control information to the user equipment through a physical downlink control channel (PDCCH); and receiving acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information from the user equipment, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is received using a physical uplink control channel (PUCCH) resource determined based on “[Equation 1] $n^{(1)}_{PUCCH}=f(n_{CCE}, N^{(1)}_{PUCCH}, X)$” where $n^{(1)}_{PUCCH}$ is a PUCCH resource index, $N^{(1)}_{PUCCH}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{PUCCH}$, and f is a function having n_{CCE}, $N^{(1)}_{PUCCH}$, and X as arguments. Kim at Para. [0011]. Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 (L=2) on CCEs n and n+1. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the

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		PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098]. The diagram illustrates the mapping of a PUCCH resource to a CCE. At the top, a horizontal sequence of boxes represents CCEs, indexed from n-1 to n+3. An arrow labeled 'One CCE' points to box n, and an arrow labeled 'CCE index' points to the index 'n'. Below this sequence, a vertical stack of boxes represents the PDCCH structure, starting with 'PDCCH(L=2)', followed by 'DCI format A' (labeled 'Fallback DCI'), and 'DCI format B' (labeled 'TM dependent DCI'). Two dashed arrows, both labeled 'n-to-m linkage (dynamic CCE-to-AN mapping)', originate from the bottom of the DCI format A and DCI format B boxes and point to a specific PUCCH resource box 'm' in a bottom sequence of boxes indexed from m-1 to m+3. An arrow labeled 'PUCCH resource index' points to the index 'm' in this bottom sequence. Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge

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		of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
7[b]	wherein the structural information contains at least one piece of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel;	At least under Pegasus's apparent infringement theory, Kim discloses wherein the structural information contains at least one piece of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[a] and 3[a]; Kim at Paras. [0018], [0020], [0059], [0069]; [0164]. Referring to FIG. 6, an eNB may transmit scheduling information for a PDSCH to a UE through a PDCCH of an aggregation level 2 ($L=2$) on CCEs n and $n+1$. The UE is configured as a specific TM through higher-layer signaling. Therefore, a DCI format which can be transmitted to the UE is limited to a fallback DCI format (DCI format A in FIG. 6) and a TM dependent DCI format (DCI format B of FIG. 6) according to TM configured for the UE. The UE attempts to decode a PDCCH candidate(s) according to the aggregation level depending on DCI format A and DCI format B in a common SS and/or a UE-specific SS, demodulates a PDSCH using a detected DCI format, and transmits ACK/NACK for the PDSCH to the eNB using a PUCCH resource linked to a CCE of a PDCCH on which the DCI format is detected. In this case, since DCI format A and DCI format B are transmitted on the same CCE resources, they are linked to the same PUCCH resource m. Accordingly, the UE transmits ACK/NACK associated with corresponding DCI to the eNB using the PUCCH resource m in both cases in which DCI of DCI format A is detected and DCI of DCI format B is detected and the eNB receives ACK/NACK associated with the

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		corresponding DCI from the UE using the PUCCH resource m in both cases in which the DCI of DCI format A is transmitted and the DCI of DCI format B is transmitted. Kim at Para. [0098]. The diagram illustrates the mapping of DCI formats to PUCCH resources. At the top, a horizontal sequence of boxes represents CCEs with indices n-1, n, n+1, n+2, and n+3. An arrow points to box n with the label 'One CCE', and another points to the index 'n' with the label 'CCE index'. Below box n, a vertical stack of boxes is shown: 'PDCCH(L=2)', 'DCI format A' (with 'Fallback DCI' to its right), and 'DCI format B' (with 'TM dependent DCI' to its right). Below this stack, a horizontal sequence of boxes represents PUCCH resource indices with values m-1, m, m+1, m+2, and m+3. An arrow points to box m with the label 'PUCCH resource index'. Dashed lines indicate 'n-to-m linkage (dynamic CCE-to-AN mapping)' from the DCI format A/B stack to PUCCH resource m, and from the DCI format B stack to PUCCH resource m+1. Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the

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		art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
7[c]	wherein the resource of the uplink control channel for transmitting the response information of the downlink data is determined based on at least one piece of i) information on a resource of a downlink control channel for scheduling the downlink data, ii) the information on the resource allocated to the uplink control channel, and iii) the start offset information of the resource allocated to the uplink control channel;	At least under Pegasus's apparent infringement theory, Kim discloses the resource of the uplink control channel for transmitting the response information of the downlink data is determined based on at least one piece of i) information on a resource of a downlink control channel for scheduling the downlink data, ii) the information on the resource allocated to the uplink control channel, and iii) the start offset information of the resource allocated to the uplink control channel. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[e]; Kim at Paras. [0017], [0018], [0085], [0015], [0092], [0098], FIGS. 7, 8, 9, 10, 12. As an aspect of the present invention, provided herein are a method and a user equipment for transmitting an uplink signal to a base station in a wireless communication system. The method includes receiving downlink control information from the base station through a physical downlink control channel (PDCCH); and transmitting acknowledgement/negative acknowledgement (ACK/NACK) information associated with the downlink control information to the base station, wherein, when a format of the downlink control information is a first format according to a transmission mode of the user equipment, the ACK/NACK information is transmitted using a physical uplink control channel (PUCCH) resource determined based on "[Equation 1] $n^{(1)}_{\text{PUCCH}} = f(n_{\text{CCE}}, N^{(1)}_{\text{PUCCH}}, X)$" where $n^{(1)}_{\text{PUCCH}}$ is a PUCCH resource index, $N^{(1)}_{\text{PUCCH}}$ is a value received from the base station, n_{CCE} is an index of a first control channel element (CCE) in the PDCCH, X is a parameter other than n_{CCE} and $N^{(1)}_{\text{PUCCH}}$, and f is a function having n_{CCE}, $N^{(1)}_{\text{PUCCH}}$, and X as arguments. Kim at Para. [0010].

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		To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
7[d]	wherein the start offset information of the resource allocated to the uplink control channel is configured separated from offset information on a terminal different from the MTC terminal;	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information of the resource allocated to the uplink control channel is configured separated from offset information on a terminal different from the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[f]; Kim at Paras. [0002], [0097], [0102], FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
7[e]	wherein a plurality of pieces of start offset information on the	At least under Pegasus's apparent infringement theory, Kim discloses a plurality of pieces of start offset information on the resource allocated to the uplink control

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resource allocated to the uplink control channel are provided, and the plurality of pieces of start offset information are transmitted through cell-specific high layer signaling for the MTC terminal to the MTC terminal;	channel are provided, and the plurality of pieces of start offset information are transmitted through cell-specific high layer signaling for the MTC terminal to the MTC terminal. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[g]; Kim at Paras. [0021], [0045], [0066], [0072], [0075]; [0076], [0085], [0088], [0092], [0082], [0089], [0090], [0093], [0094], [0098], [0099], [0100], [0102], [0103], [0104], [0105] [0106], [0114], [0144], [0122], [0125], [0133], [0144], [0145], [0170], [0173], [0190], [0196], [0187]; FIGS. 5, 7, 8, 9, 10, 12. As a further aspect of the present invention, provided herein are a method and a base station for receiving an uplink signal from a user equipment in a wireless communication system. The method includes transmitting a higher-layer signal including a plurality of parameter sets to the user equipment; transmitting information indicating a specific parameter set among the parameter sets to the user equipment through a physical downlink shared channel (PDSCH); and receiving the uplink signal generated using a parameter in the specific parameter set from the user equipment. Kim at Para. [0018]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

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7[f]	wherein the start offset information of the resource allocated to the uplink control channel is determined based on a coverage level; and	At least under Pegasus's apparent infringement theory, Kim discloses the start offset information of the resource allocated to the uplink control channel is determined based on a coverage level. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[h]; Kim at Paras. [0002], [0042], [0102], [0112], [0019], [0020], [0092], [0093], [0098]. Referring to FIG. 6, each PUCCH resource index corresponds to a dynamic PUCCH resource for ACK/NACK. According to channel state, an eNB transmits DCI (or fallback DCI) according to TM configured for the UE to the UE on a PDCCH. The fallback DCI refers to DCI to be used for communication according to another TM having lower communication efficiency (hereinafter, fallback mode) than the corresponding TM, in preparation for the case in which it is difficult to perform communication according to TM due to a poor channel state. Hereinafter, DCI according to TM will be referred to as TM dependent DCI and DCI for a fallback mode will be referred to as fallback DCI. In addition, a DCI format defined for transmission of the TM dependent DCI will be referred to as a TM dependent DCI format and a DCI format defined for transmission of the fallback DCI will be referred to as a fallback DCI format. Referring to Table 6, for example, DCI format 1A may correspond to the fallback DCI format. Upon detecting the fallback DCI, the UE may switch to the fallback mode and operate in the fallback mode. Alternatively, when RRC reconfiguration should be performed, the UE may switch to the fallback mode and operate in the fallback mode in order to eliminate ambiguity generated while RRC reconfiguration is performed. Kim at Para. [0097].

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		Kim at FIG. 6. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
7[g]	wherein when the response information of the downlink data of the MTC terminal is	At least under Pegasus’s apparent infringement theory, Kim discloses when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the repeated transmission is performed using a same uplink control

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	repeatedly transmitted, the repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted.	channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted. For example, Kim discloses this limitation based on the following exemplary citations: <i>See</i> claim limitation 1[i], Kim at Paras. [0055], [0058]; [0094], [0107]. The PUCCH may be used to transmit the following control information. Scheduling request (SR): SR is information used to request a UL-SCH resource and is transmitted using an on-off keying (OOK) scheme. HARQ-ACK: HARQ-ACK is a response to a PDCCH and/or a response to a DL data packet (e.g. a codeword) on a PDSCH. HARQ-ACK indicates whether the PDCCH or PDSCH has been successfully received. 1-bit HARQ-ACK is transmitted in response to a single DL codeword and 2-bit HARQ-ACK is transmitted in response to two DL codewords. A HARQ-ACK response includes a positive ACK (simply, ACK), negative ACK (NACK), discontinuous transmission (DTX), or NACK/DRX. HARQ-ACK is used interchangeably with HARQ ACK/NACK and ACK/NACK. Channel state information (CSI): CSI is feedback information for a DL channel. MIMO-related feedback information includes a rank indicator (RI) and a precoding matrix indicator (PMI). Kim at Paras. [0078]-[0081]. To the extent it is found that Kim does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Kim does not anticipate this claim, Kim renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Kim with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same

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		field of endeavor to address the same known problems, according to known methods which would yield predictable results.