

# EXHIBIT H

**EXHIBIT E-12**

**Summary of Invalidity Analysis of U.S. Patent No. 10,594,460 (“’460 Patent”) in view of WO 2018/129085 A1 (“Yin”)**

WO 2018/129085 (“Yin”) published on July 12, 2018 and claims priority to U.S. Provisional Application No. 62/442,864 (’864 Application) filed on January 5, 2017. The ’864 Application supports at least Claim 1 of Yin. By way of example only, at least the following disclosures of the ’864 Application are sufficient to support Claim 1 of Yin. *See, e.g.*, [0031], [00110], [00112], [00115], [00116], [00117]. Therefore, Yin qualifies as prior art to the ’460 Patent under at least 35 U.S.C. § 102(a). Defendants reserve the right to identify additional support. As described in the following claim chart, at least under Pegasus’s apparent infringement theory, the asserted claims of the ’460 Patent are invalid as expressly and/or inherently anticipated by Yin.

To the extent that Yin is found not to anticipate, expressly or inherently, one or more of the asserted claims of the ’460 Patent, at least under Pegasus’s apparent infringement theory, these claims are invalid as obvious in view of Yin 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’ Amended Invalidity Contentions and accompanying charts and appendices. A person of ordinary skill would have been motivated to combine Yin 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

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Claim Language                                          |                                                                                                                                                   | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1[pre]                                                  | A method for a user equipment (UE) to transmit an uplink (UL) control channel and a UL data channel to a base station (BS), the method comprising | <p>To the extent the preamble is limiting, at least under Pegasus's apparent infringement theory, Yin discloses a method for a user equipment (UE) to transmit an uplink (UL) control channel and a UL data channel to a base station (BS). For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0053] Fifth generation (5G) cellular communications (also referred to as "New Radio", "New Radio Access Technology" or "NR" by 3GPP) envisions the use of time/frequency/space resources to allow for enhanced mobile broadband (eMBB) communication and ultra-reliable low latency communication (URLLC) services, as well as massive machine type communication (mMTC) like services. In order for the services to use the time/frequency/space medium efficiently it would be useful to be able to flexibly schedule services on the medium so that the medium may be used as effectively as possible, given the conflicting needs of URLLC, eMBB, and mMTC. A new radio base station may be referred to as a gNB. A gNB may also be more generally referred to as a base station device.</p> <p>[0058] The UE 102 and the gNB 160 may use one or more channels 119, 121 to communicate with each other. For example, a UE 102 may transmit information or data to the gNB 160 using one or more uplink channels 121. Examples of uplink channels 121 include a PUCCH and a PUSCH, etc. The one or more gNBs 160 may also transmit information or data to the one or more UEs 102 using one or more downlink channels 119, for instance. Examples of downlink channels 119 include a PDCCH, a PDSCH, etc. Other kinds of channels may be used. [0059] Each of the one or more UEs 102 may include one or more transceivers 118, one or more demodulators 114, one or more decoders 108, one or more encoders 150, one or more modulators 154, a data buffer 104 and a UE operations module 124. For example, one or more reception and/or transmission paths may be implemented in the UE 102. For convenience, only a single transceiver 118, decoder 108, demodulator 114, encoder 150 and modulator 154 are illustrated in the UE 102, though multiple parallel elements (e.g., transceivers 118,</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Claim Language                                          | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                         | <p>decoders 108, demodulators 114, encoders 150 and modulators 154) may be implemented.</p> <p>[0062] The UE short PUCCH module 126 may implement a short PUCCH design for 5th generation (5G) new radio (NR). Uplink control information and uplink waveform in NR are described. In LTE, the UCI carries hybrid-ARQ acknowledgements (HARQ-ACK), channel state information (CSI), and a scheduling request (SR). The CSI may include one or more of channel quality indicator (CQI), rank indication (RI), precoding matrix indicator (PMI), precoding type indicator (PTI), etc. Multiple dimensions of CSI may be reported from one or more cells to support FD-MIMO and CoMP operations.</p> <p>[0048] At least some aspects of the systems and methods disclosed herein may be described in relation to the 3GPP LTE, LTE-Advanced (LTE-A) and other standards (e.g., 3GPP Releases 8, 9, 10, 11 and/or 12). However, the scope of the present disclosure should not be limited in this regard. At least some aspects of the systems and methods disclosed herein may be utilized in other types of wireless communication systems.</p> <p>[0066] In NR, different numerologies are supported on the same or different carriers. For the uplink transmission supports two waveform/modulation schemes based on Orthogonal Frequency Division Multiplexing (OFDM). One waveform/modulation scheme is cyclic prefix OFDM (CP-OFDM). Another waveform/modulation scheme is discrete Fourier transform (DFT) spread OFDM (DFT-S-OFDM), also known as single carrier FDMA (SC-FDMA), or low Peak-to-Average Power Ratio (PAPR) waveform. Therefore, the uplink control and uplink data channel may be configured separately with the same or different waveforms and numerologies.</p> <p><i>See also</i> Yin at [0057], [0167], [00211], Fig. 1, Fig. 25</p> <p><i>See</i> '864 Application at [0045], [0048], [0050], [0055], [0056], [0058].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Claim Language                                          |                                                                                                                                     | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                         |                                                                                                                                     | <p>this claim, Yin 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 Yin 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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1[a]                                                    | receiving, from a BS, bandwidth part (BWP) configuration information of a BWP set composed of one or more BWPs configured for a UE; | <p>At least under Pegasus's apparent infringement theory, Yin discloses receiving, from a BS, bandwidth part (BWP) configuration information of a BWP set composed of one or more BWPs configured for a UE. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0052] "Configured cells" are those cells of which the UE is aware and is allowed by an eNB to transmit or receive information. "Configured cell(s)" may be serving cell(s). The UE may receive system information and perform the required measurements on all configured cells. "Configured cell(s)" for a radio connection may consist of a primary cell and/or no, one, or more secondary cell(s). "Activated cells" are those configured cells on which the UE is transmitting and receiving. That is, activated cells are those cells for which the UE monitors the physical downlink control channel (PDCCH) and in the case of a downlink transmission, those cells for which the UE decodes a physical downlink shared channel (PDSCH). "Deactivated cells" are those configured cells that the UE is not monitoring the transmission PDCCH. It should be noted that a "cell" may be described in terms of differing dimensions. For example, a "cell" may have temporal, spatial (e.g., geographical) and frequency characteristics.</p> <p>[0053] Fifth generation (5G) cellular communications (also referred to as "New Radio", "New Radio Access Technology" or "NR" by 3GPP) envisions the use of time/frequency/space resources to allow for enhanced mobile broadband (eMBB) communication and ultra-reliable low latency communication (URLLC) services, as</p> |

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|                                                         | <p>well as massive machine type communication (mMTC) like services. In order for the services to use the time/frequency/space medium efficiently it would be useful to be able to flexibly schedule services on the medium so that the medium may be used as effectively as possible, given the conflicting needs of URLLC, eMBB, and mMTC. A new radio base station may be referred to as a gNB. A gNB may also be more generally referred to as a base station device.</p> <p>[0054] In 5G NR, at least two different types of uplink control channel (PUCCH) formats may be specified: at least one short PUCCH format and one long PUCCH format. The PUCCH channel is designed to carry uplink control information (UCI). In NR, multiple short PUCCH formats may be defined, and the PUCCH format of a UE may be configured by a base station.</p> <p>[0055] In NR, several PUCCH formats will be specified. For UCI, different UCI may be reported on different PUCCH channel formats. In 5G NR, both CP-OFDM and DFT- S-OFDM waveforms are supported for UL transmission. Also, different numerologies may be used on one or more carriers or serving cells. Detailed mapping methods and signaling required for the short PUCCH formats in NR are described. In short PUCCH designs, the lengths of 1 symbol and 2 symbols are considered. However, detailed reference symbol and control information mapping are not defined yet. Furthermore, methods to configure a PUCCH resource are not discussed yet. The systems and methods described herein detail formats for short PUCCH design. In particular, the RS patterns, the RS location and configurations for a short PUCCH are described herein.</p> <p>[0085] Furthermore, a short PUCCH may occupy multiple RBs especially if UE multiplexing is supported. In this case, the orthogonal sequence can be designed based on the total number of REs. Thus, different UE multiplexing capability and UCI payload sizes can be supported accordingly. To provide frequency diversity, separate</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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|                                                         | <p>PUCCH regions or subbands should be configured for a UE 102, and the PUCCH can be transmitted simultaneously in both regions/subbands</p> <p>[0086] To summarize, for a sequence based 1- symbol short PUCCH, one or more of the following parameters should be specified: the number of RBs in a PUCCH region/subband; the orthogonal sequence set of the PUCCH resource; the orthogonal sequence subset assign to the given UE 102; and the frequency diversity with multiple PUCCH regions/subbands.</p> <p>[00113] As a summary, for a 2-symbol short PUCCH resource, one or more of the following parameters should be specified: the waveform (e.g., CP-OFDM or DFT-S-OFDM); the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the RS location; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands.</p> <p>[00114] Configuration of a short PUCCH is also described herein. In LTE, multiple PUCCH formats are defined for different maximum payload sizes. Similarly in NR, multiple short PUCCH formats should be configured for different maximum payload sizes. Even if short PUCCH is designed for HARQ-ACK and SR only, the payload sizes may be different for different use cases. For example, ultra-reliable low latency communication (URLLC) traffic may need only 1 bit of HARQ-ACK, but feedback for eMBB traffic may require more HARQ-ACK bits. Thus, tradeoffs between RS, information bits and multiplexing capabilities should be considered.</p> <p>[00115] Furthermore, for a given PUCCH format, the resource allocation can be more flexible than LTE depending on the channel conditions. For UEs 102 with very good signal condition, fewer RB resources may be allocated for a PUCCH. For UEs 102 with bad signal conditions (e.g., cell edge UEs 102), more RB resources may be allocated for a PUCCH.</p> |

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|                                                         | <p>[00116] Therefore, for a short PUCCH, at least the following parameters may be configured for a given UE 102: the number of symbols for the PUCCH; the waveform (e.g., CP-OFDM or DFT-S-OFDM); the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the RS location for 2-symbol PUCCH; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands. In order to reduce the signaling overhead, a list of supported short uplink control channel formats can be specified, each with a given set of parameters, and the name or index of a support short PUCCH format is indicated or configured to a UE 102.</p> <p>[00117] Moreover, the 5G NR supports different frequency bands with different channel characteristics. Thus, the PUCCH behavior may be different for different frequency bands. For below 6GHz frequency bands, the channel condition is more stable. Thus, it is better to use a semi-static configured PUCCH resource, or a dynamic indicated PUCCH resource. For frequency band above 6GHz, beamforming technology is critical for the operation. Considering beam sweeping, a UE 102 may use different beams in different symbols.</p> <p><i>See also</i> Yin at [0048].</p> <p><i>See</i> '864 Application at [0044], [0045], [0046], [0047], [0077], [0078], [00105], [00106], [00107], [00108], [00109], .</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin with any of the other prior art references</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|                                                         |                                                                                                                                                                                 | 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, from the BS, frequency hopping configuration information for a UL control channel and a UL data channel transmitted through one transmission BWP of the BWP set; and | <p>At least under Pegasus's apparent infringement theory, Yin discloses receiving, from the BS, frequency hopping configuration information for a UL control channel and a UL data channel transmitted through one transmission BWP of the BWP set. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0042] A short PUCCH may be a 2-symbol short PUCCH. The 2-symbol short PUCCH may employ a discrete Fourier transform spread OFDM (DFT-S-OFDM) waveform. A format may consist of a number of RBs, a RS location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions. The 2- symbol short PUCCH may employ CP-OFDM waveform. A format may consist of a number of RBs, a RS pattern and location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions.</p> <p>[0095] Frequency hopping support for an RS and UCI multiplexing-based PUCCH are also described herein. To provide frequency diversity, separate PUCCH regions or subbands should be configured for a UE 102, and the PUCCH can be transmitted simultaneously in both regions/subbands. As a summary, for a 1-symbol short PUCCH based on RS and UCI multiplexing, the following parameters should be specified: the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands.</p> <p>[00112] To provide frequency diversity, frequency hopping of a 2- symbol short PUCCH can be configured. In this case, separate PUCCH regions or subbands should be configured for a UE 102, and the PUCCH can be transmitted simultaneously in both regions/subbands. If frequency diversity is supported for a CP-OFDM based 2- symbol short PUCCH, different approaches may be used for DMRS location. In one approach, the DMRS location of the PUCCH transmission in different PUCCH regions or</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                                                         | <p>subbands can be switched (i.e., if the RS is located in the first symbol in a first PUCCH region, the RS should be located in the second symbol in the second PUCCH region for frequency diversity). In another approach, the DMRS location of the PUCCH transmission in different PUCCH regions or subbands can be the same.</p> <p>[00116] Therefore, for a short PUCCH, at least the following parameters may be configured for a given UE 102: the number of symbols for the PUCCH; the waveform (e.g., CP-OFDM or DFT-S-OFDM); the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the RS location for 2-symbol PUCCH; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands. In order to reduce the signaling overhead, a list of supported short uplink control channel formats can be specified, each with a given set of parameters, and the name or index of a support short PUCCH format is indicated or configured to a UE 102.</p> <p>[00213] A short PUCCH may be a 2-symbol short PUCCH. A 2-symbol short PUCCH may employ a discrete Fourier transform spread OFDM (DFT-S-OFDM) waveform. A format may consist of a number of RBs, a RS location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions. Alternatively, a 2-symbol short PUCCH may employ a CP-OFDM waveform, and a format consists of a number of RBs, a RS pattern and location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions.</p> <p><i>See also</i> Yin at [0048], [00102].</p> <p><i>See also</i> '864 Application at [0034], [0087], [0094], [0104], [00108], [0199].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin with any of the other prior art references</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Claim Language                                          |                                                                                                                                                                                                | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         |                                                                                                                                                                                                | 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]                                                    | transmitting a UL control channel and a UL data channel to the BS through the transmission BWP based on the BWP configuration information and the frequency hopping configuration information, | <p>At least under Pegasus’s apparent infringement theory, Yin discloses transmitting a UL control channel and a UL data channel to the BS through the transmission BWP based on the BWP configuration information and the frequency hopping configuration information. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0038] A method for a base station is also described. The method includes sending a first higher layer configuration indicating at least a short uplink control channel (PUCCH) resource configuration. The method also includes sending a second higher layer configuration indicating multiple sets of PUCCH resource configurations, one set of PUCCH resource configurations within the multiple sets of PUCCH resource configurations include the short PUCCH resource configuration. The method further includes selecting a set of PUCCH resource configurations from the sets of PUCCH resource configurations based on a payload size of uplink control information (UCI). The method additionally includes receiving the UCI on a PUCCH resource, the PUCCH resource corresponding to a PUCCH resource configuration within the selected set of PUCCH resource configurations.</p> <p>[0039] Another user equipment (UE) is described. The UE includes a processor and memory in electronic communication with the processor. Instructions stored in the memory are executable to determine the uplink control channel (PUCCH) format and configuration based on a signaling from a gNB. The instructions are also executable to determine the control channel used for uplink control information (UCI) feedback. The instructions are further executable to determine the resource of the control channel for UCI feedback. The instructions are additionally executable to transmit UCI on the selected channel.</p> |

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|                                                         | <p>[0095] Frequency hopping support for an RS and UCI multiplexing-based PUCCH are also described herein. To provide frequency diversity, separate PUCCH regions or subbands should be configured for a UE 102, and the PUCCH can be transmitted simultaneously in both regions/subbands. As a summary, for a 1-symbol short PUCCH based on RS and UCI multiplexing, the following parameters should be specified: the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands</p> <p>[00165] In Figure 3, one uplink subframe 369 may include two uplink slots 383. <math>N^{RB}</math> is uplink bandwidth configuration of the serving cell, expressed in multiples of RB <math>N^{sc}</math>, where <math>N^{sc}</math> is a resource block 389 size in the frequency domain expressed as a number of subcarriers, and <math>N^{symb}</math> is the number of SC-FDMA symbols 393 in an uplink slot 383. A resource block 389 may include a number of resource elements (RE) 391.</p> <p style="text-align: center;"><b>FIG. 3</b></p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| Claim Language                                          |                                                                                                                                                                                    | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                         |                                                                                                                                                                                    | <p>[00216] The UE 102 may determine 2504 the control channel used for uplink control information (UCI) feedback. The UE 102 may determine 2506 the resource of the control channel for UCI feedback. The UE 102 may transmit 2508 UCI on the selected channel.</p> <p><i>See also</i> Yin at [0048].</p> <p><i>See also</i> '864 Application at [0057], [0087], [00157], [0202], Fig. 25.</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |
| 1[d]                                                    | wherein the frequency hopping configuration information for a UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values, and | <p>At least under Pegasus's apparent infringement theory, Yin discloses wherein the frequency hopping configuration information for a UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0035] The first higher layer configuration may include at least a number of symbols, a number of resource blocks (RBs), and whether frequency hopping is applied in a case of a short PUCCH with two symbols. In the case of the short PUCCH with two symbols, reference signal (RS) locations on the two symbols may be the same. The RS locations may be resource elements indexed with { 1,4,7,10}.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| Claim Language                                          | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                         | <p>[0036] A base station is also described. The base station includes a processor and memory in electronic communication with the processor. Instructions stored in the memory are executable to send a first higher layer configuration indicating at least a short uplink control channel (PUCCH) resource configuration. The instructions are also executable to send a second higher layer configuration indicating multiple sets of PUCCH resource configurations, one set of PUCCH resource configurations within the multiple sets of PUCCH resource configurations include the short PUCCH resource configuration. The instructions are further executable to select a set of PUCCH resource configurations from the sets of PUCCH resource configurations based on a payload size of uplink control information (UCI). The instructions are additionally executable to receive the UCI on a PUCCH resource, the PUCCH resource corresponding to a PUCCH resource configuration within the selected set of PUCCH resource configurations.</p> <p>[0036] A base station is also described. The base station includes a processor and memory in electronic communication with the processor. Instructions stored in the memory are executable to send a first higher layer configuration indicating at least a short uplink control channel (PUCCH) resource configuration. The instructions are also executable to send a second higher layer configuration indicating multiple sets of PUCCH resource configurations, one set of PUCCH resource configurations within the multiple sets of PUCCH resource configurations include the short PUCCH resource configuration. The instructions are further executable to select a set of PUCCH resource configurations from the sets of PUCCH resource configurations based on a payload size of uplink control information (UCI). The instructions are additionally executable to receive the UCI on a PUCCH resource, the PUCCH resource corresponding to a PUCCH resource configuration within the selected set of PUCCH resource configurations.</p> <p>[0042] A short PUCCH may be a 2-symbol short PUCCH. The 2-symbol short PUCCH may employ a discrete Fourier transform spread OFDM (DFT-S-OFDM) waveform. A format may consist of a number of RBs, a RS location, and/or orthogonal</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Claim Language                                          | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                         | <p>sequences on RS and data symbols, and/or one or more control resource regions. The 2- symbol short PUCCH may employ CP-OFDM waveform. A format may consist of a number of RBs, a RS pattern and location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions.</p> <p>[00112] To provide frequency diversity, frequency hopping of a 2- symbol short PUCCH can be configured. In this case, separate PUCCH regions or subbands should be configured for a UE 102, and the PUCCH can be transmitted simultaneously in both regions/subbands. If frequency diversity is supported for a CP-OFDM based 2- symbol short PUCCH, different approaches may be used for DMRS location. In one approach, the DMRS location of the PUCCH transmission in different PUCCH regions or subbands can be switched (i.e., if the RS is located in the first symbol in a first PUCCH region, the RS should be located in the second symbol in the second PUCCH region for frequency diversity). In another approach, the DMRS location of the PUCCH transmission in different PUCCH regions or subbands can be the same.</p> <p>[00213] A short PUCCH may be a 2-symbol short PUCCH. A 2-symbol short PUCCH may employ a discrete Fourier transform spread OFDM (DFT-S-OFDM) waveform. A format may consist of a number of RBs, a RS location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions. Alternatively, a 2-symbol short PUCCH may employ a CP-OFDM waveform, and a format consists of a number of RBs, a RS pattern and location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions.</p> <p><i>See also</i> Yin at [0048].</p> <p><i>See also</i> '864 Application at [0033], [0034], [00104], [00199].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Claim Language                                          |                                                                                                                                                                                                                                   | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         |                                                                                                                                                                                                                                   | have been motivated to combine Yin 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 a frequency hopping offset value used to transmit the UL data channel among the frequency hopping offset values included in the frequency hopping offset set is indicated by UL grant downlink control information (DCI). | <p>At least under Pegasus's apparent infringement theory, Yin discloses wherein a frequency hopping offset value used to transmit the UL data channel among the frequency hopping offset values included in the frequency hopping offset set is indicated by UL grant downlink control information (DCI). For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[00100] In a third method, the RS location is changeable or configurable. The RS location within a 2-symbol PUCCH can be semi-statically configured by higher layer signaling for a given UE 102. The RS location within a 2-symbol PUCCH can be dynamically indicated by a DCI. The adjustable RS location can be used to avoid interference due to RS misalignment among different UEs 102.</p> <p>[00124] In another aspect, a short PUCCH format and/or resource for a UE 102 can be dynamically indicated by physical layer signaling (e.g., a DCI). The DCI format may have an ft-bit information field indicating the PUCCH format irrespective of RRC configuration. Alternatively, the DCI format may have the n-bit information field if the UE 102 is configured with some configuration (e.g., a configuration of short PUCCH format, a configuration of a certain transmission mode/scheme, a configuration of License-assisted access (LAA) cell, etc.) by higher layer signaling, and the DCI format may not have the n-bit information field otherwise. The DCI formats related to system information, paging and/or random access response may not have the n-bit information field, and the other DCI formats (e.g., DCI formats related to user-specific payload) may have the n-bit information field. [00125] In another aspect, a short PUCCH format and/or resource for a UE 102 can be adaptively determined based on the UCI types and/or the number of UCI bits. If UCI types are HARQ-ACK or SR only, a short PUCCH format may be used. A short PUCCH format may be used if the</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| Claim Language                                          | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                         | <p>UCI payload is smaller or equal to a threshold (e.g., 4 bits or 8 bits). Different short PUCCH configurations may be used for different payload sizes. A long PUCCH format may be used if the UCI payload size is greater than the threshold.</p> <p>[00198] In a third method (not shown), the RS location is changeable or configurable. The RS location within a 2-symbol PUCCH can be semi- statically configured by higher layer signaling for a given UE 102. The RS location within a 2-symbol PUCCH can be dynamically indicated by a DCI. The adjustable RS location can be used to avoid interference due to RS misalignment among different UEs 102.</p> <p><i>See also</i> Yin at [0048], [00121], [00124], [0199].</p> <p><i>See</i> '864 Application at [0092], [00116], [00184].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

2. Claim 2

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| Claim Language                                          |                                                                                                                                                                                                                                                                                                                                                                                                                           | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2                                                       | <p>The method of claim 1, wherein the frequency hopping configuration information for a UL control channel includes at least one of information indicating whether to perform frequency hopping, physical resource block (PRB) allocation information of a first frequency resource region of the UL control channel, and PRB allocation information of a second frequency resource region of the UL control channel.</p> | <p>At least under Pegasus’s apparent infringement theory, Yin discloses the method of claim 1, wherein the frequency hopping configuration information for a UL control channel includes at least one of information indicating whether to perform frequency hopping, physical resource block (PRB) allocation information of a first frequency resource region of the UL control channel, and PRB allocation information of a second frequency resource region of the UL control channel. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0095] Frequency hopping support for an RS and UCI multiplexing-based PUCCH are also described herein. To provide frequency diversity, separate PUCCH regions or subbands should be configured for a UE 102, and the PUCCH can be transmitted simultaneously in both regions/subbands. As a summary, for a 1-symbol short PUCCH based on RS and UCI multiplexing, the following parameters should be specified: the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands.</p> <p>[00115] Furthermore, for a given PUCCH format, the resource allocation can be more flexible than LTE depending on the channel conditions. For UEs 102 with very good signal condition, fewer RB resources may be allocated for a PUCCH. For UEs 102 with bad signal conditions (e.g., cell edge UEs 102), more RB resources may be allocated for a PUCCH. [00116] Therefore, for a short PUCCH, at least the following parameters may be configured for a given UE 102: the number of symbols for the PUCCH; the waveform (e.g., CP-OFDM or DFT-S-OFDM); the number of RBs in a PUCCH region/subband; the RS pattern and spreading sequence if applied; the RS location for 2-symbol PUCCH; the spreading sequence on UCI data symbols if applied; and the frequency diversity with multiple PUCCH regions/subbands. In order to reduce the signaling overhead, a list of supported short uplink control channel formats can be specified, each with a given set of parameters, and the name or index of a support short PUCCH format is indicated or configured to a UE 102.</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Claim Language                                          |  | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                         |  | <p>[0035] The first higher layer configuration may include at least a number of symbols, a number of resource blocks (RBs), and whether frequency hopping is applied in a case of a short PUCCH with two symbols. In the case of the short PUCCH with two symbols, reference signal (RS) locations on the two symbols may be the same. The RS locations may be resource elements indexed with { 1,4,7,10}.</p> <p><i>See also</i> Yin at [0048], [00211].</p> <p><i>See also</i> '864 Application at [0087], [00107].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

### 3. Claim 3

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                            |                                                                                                                                                                                                                                                   |
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| Claim Language                                          |                                                                                            | Exemplary Citations to Yin                                                                                                                                                                                                                        |
| 3                                                       | The method of claim 1, wherein a number of frequency hopping offset values included in the | At least under Pegasus's apparent infringement theory, Yin discloses the method of claim 1, wherein a number of frequency hopping offset values included in the frequency hopping offset set is determined based on a number of physical resource |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| Claim Language                                                                                                                     | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| frequency hopping offset set is determined based on a number of physical resource blocks (PRBs) constituting the transmission BWP. | <p>blocks (PRBs) constituting the transmission BWP. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0042] A short PUCCH may be a 2-symbol short PUCCH. The 2-symbol short PUCCH may employ a discrete Fourier transform spread OFDM (DFT-S-OFDM) waveform. A format may consist of a number of RBs, a RS location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions. The 2- symbol short PUCCH may employ CP-OFDM waveform. A format may consist of a number of RBs, a RS pattern and location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions.</p> <p>[00167] In the uplink, in addition to CP-OFDM, a Single-Carrier Frequency Division Multiple Access (SC-FDMA) access scheme may be employed, which is also referred to as Discrete Fourier Transform-Spreading OFDM (DFT-S-OFDM). In the uplink, PUCCH, PDSCH, PRACH and the like may be transmitted. An uplink radio frame may consist of multiple pairs of uplink resource blocks. The uplink RB pair is a unit for assigning uplink radio resources, defined by a predetermined bandwidth (RB bandwidth) and a time slot. The uplink RB pair consists of two uplink RBs that are continuous in the time domain.</p> <p>[00168] The uplink RB may consist of twelve sub-carriers in frequency domain and seven (for normal CP) or six (for extended CP) OFDM/DFT-S-OFDM symbols in time domain. A region defined by one sub-carrier in the frequency domain and one OFDM/DFT-S-OFDM symbol in the time domain is referred to as a RE and is uniquely identified by the index pair (k,l) in a slot, where k and l are indices in the frequency and time domains respectively. While uplink subframes in one component carrier (CC) are discussed herein, uplink subframes are defined for each CC.</p> <p>[00213] A short PUCCH may be a 2-symbol short PUCCH. A 2-symbol short PUCCH may employ a discrete Fourier transform spread OFDM (DFT-S-OFDM) waveform. A format may consist of a number of RBs, a RS location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions. Alternatively, a 2-symbol short PUCCH may employ a CP-OFDM waveform, and a format consists of a</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| Claim Language                                          | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                         | <p>number of RBs, a RS pattern and location, and/or orthogonal sequences on RS and data symbols, and/or one or more control resource regions.</p> <p>[00183] Figure 10 shows examples of UL control channel structures. UL control channel may be mapped on REs which are defined a PRB and a slot in frequency and time domains, respectively. This UL control channel may be referred to as a long format (or just the 1st format). UL control channels may be mapped on REs on a limited OFDM symbols in time domain. This may be referred to as a short format (or just the 2nd format). The UL control channels with a short format may be mapped on REs within a single PRB. Alternatively, the UL control channels with a short format may be mapped on REs within multiple PRBs. For example, interlaced mapping may be applied, namely the UL control channel may be mapped to every N PRBs (e.g. 5 or 10) within a system bandwidth.</p> <p><i>See also</i> Yin at [0048].</p> <p><i>See also</i> '864 Application at [0034], [0159], [0160], [0199].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

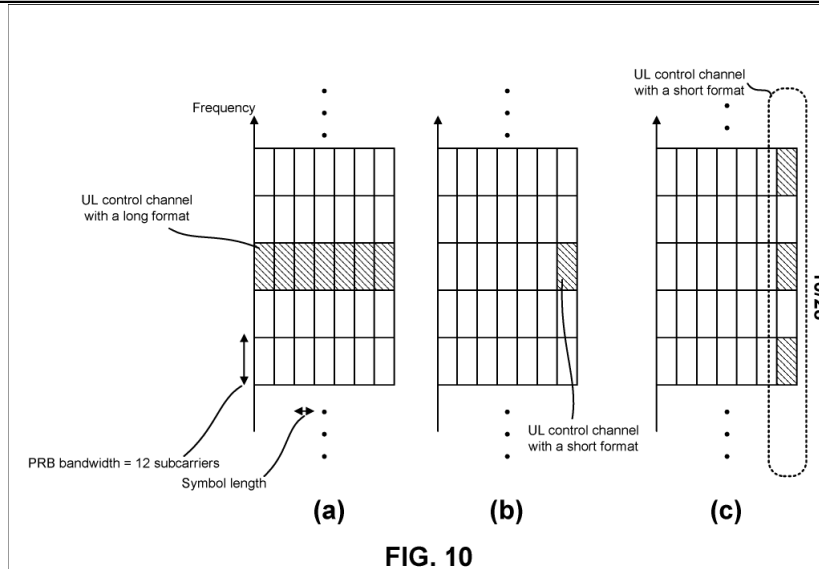
4. Claim 4

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Claim Language                                          |                                                                                                                                                                                                                                                               | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4                                                       | <p>The method of claim 3, wherein the number of frequency hopping offset values included in the frequency hopping offset set is determined depending on whether the number of PRBs constituting the transmission BWP is a preset threshold value or less.</p> | <p>At least under Pegasus’s apparent infringement theory, Yin discloses the method of claim 3, wherein the number of frequency hopping offset values included in the frequency hopping offset set is determined depending on whether the number of PRBs constituting the transmission BWP is a preset threshold value or less. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p>[0048] At least some aspects of the systems and methods disclosed herein may be described in relation to the 3GPP LTE, LTE-Advanced (LTE-A) and other standards (e.g., 3GPP Releases 8, 9, 10, 11 and/or 12). However, the scope of the present disclosure should not be limited in this regard. At least some aspects of the systems and methods disclosed herein may be utilized in other types of wireless communication systems.</p> <p>[00183] Figure 10 shows examples of UL control channel structures. UL control channel may be mapped on REs which are defined a PRB and a slot in frequency and time domains, respectively. This UL control channel may be referred to as a long format (or just the 1st format). UL control channels may be mapped on REs on a limited OFDM symbols in time domain. This may be referred to as a short format (or just the 2nd format). The UL control channels with a short format may be mapped on REs within a single PRB. Alternatively, the UL control channels with a short format may be mapped on REs within multiple PRBs. For example, interlaced mapping may be applied, namely the UL control channel may be mapped to every N PRBs (e.g. 5 or 10) within a system bandwidth.</p> |

**Invalidity of U.S. Patent No. 10,594,460 in view of Yin**

**Claim Language**

**Exemplary Citations to Yin**



*See also* '864 Application at [00173].

To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Claim Language                                          |                                                                                                                                                     | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5[pre]                                                  | A method for a base station (BS) to receive an uplink (UL) control channel and a UL data channel from a user equipment (UE), the method comprising: | <p>To the extent the preamble is limiting, at least under Pegasus’s apparent infringement theory, Yin discloses a method for a base station (BS) to receive an uplink (UL) control channel and a UL data channel from a user equipment (UE). For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[pre].</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> ’864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |
| 5[a]                                                    | transmitting bandwidth part (BWP) configuration information of a BWP set composed of one or more BWPs configured for a UE to the UE;                | <p>At least under Pegasus’s apparent infringement theory, Yin discloses transmitting bandwidth part (BWP) configuration information of a BWP set composed of one or more BWPs configured for a UE to the UE. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[a].</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> ’864 Application at [0045], [0050], [0056].</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                             | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                         |                                                                                                                                                                             | <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5[b]                                                    | transmitting frequency hopping configuration information for a UL control channel and a UL data channel transmitted through one reception BWP of the BWP set to the UE; and | <p>At least under Pegasus's apparent infringement theory, Yin discloses transmitting frequency hopping configuration information for a UL control channel and a UL data channel transmitted through one reception BWP of the BWP set to the UE. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[b].</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> '864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5[c]                                                    | receiving the UL control channel and the UL data channel from the UE through the reception BWP based on the BWP configuration information and the frequency hopping configuration information, | <p>At least under Pegasus’s apparent infringement theory, Yin discloses receiving the UL control channel and the UL data channel from the UE through the reception BWP based on the BWP configuration information and the frequency hopping configuration information. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[c].</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> ’864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |
| 5[d]                                                    | wherein the frequency hopping configuration information for a UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values, and             | <p>At least under Pegasus’s apparent infringement theory, Yin discloses wherein the frequency hopping configuration information for a UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[d].</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> ’864 Application at [0045], [0050], [0056].</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                                          | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         |                                                                                                                                                                                                                                          | <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5[e]                                                    | <p>wherein a frequency hopping offset value used to transmit the UL data channel among the frequency hopping offset values included in the frequency hopping offset set is indicated by UL grant downlink control information (DCI).</p> | <p>At least under Pegasus's apparent infringement theory, Yin discloses wherein a frequency hopping offset value used to transmit the UL data channel among the frequency hopping offset values included in the frequency hopping offset set is indicated by UL grant downlink control information (DCI). For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[e].</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> '864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

6. Claim 6

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                                                                                                                                                                                                                           | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 6                                                       | <p>The method of claim 5, wherein the frequency hopping configuration information for a UL control channel includes at least one of information indicating whether to perform frequency hopping, physical resource block (PRB) allocation information of a first frequency resource region of the UL control channel, and PRB allocation information of a second frequency resource region of the UL control channel.</p> | <p>At least under Pegasus’s apparent infringement theory, Yin discloses the method of claim 5, wherein the frequency hopping configuration information for a UL control channel includes at least one of information indicating whether to perform frequency hopping, physical resource block (PRB) allocation information of a first frequency resource region of the UL control channel, and PRB allocation information of a second frequency resource region of the UL control channel. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> claim 2.</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> ’864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

7. Claim 7

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                            | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 7                                                       | The method of claim 5, wherein a number of frequency hopping offset values included in the frequency hopping offset set is determined based on a number of physical resource blocks (PRBs) constituting the reception BWP. | <p>At least under Pegasus's apparent infringement theory, Yin discloses the method of claim 5, wherein a number of frequency hopping offset values included in the frequency hopping offset set is determined based on a number of physical resource blocks (PRBs) constituting the reception BWP. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> claim 3.</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> '864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

8. Claim 8

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                |                                                                                                                                                                   |
|---------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                | Exemplary Citations to Yin                                                                                                                                        |
| 8                                                       | The method of claim 7, wherein the number of frequency hopping | At least under Pegasus's apparent infringement theory, Yin discloses the method of claim 7, wherein the number of frequency hopping offset values included in the |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                      | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | offset values included in the frequency hopping offset set is determined depending on whether the number of PRBs constituting the reception BWP is a preset threshold value or less. | <p>frequency hopping offset set is determined depending on whether the number of PRBs constituting the reception BWP is a preset threshold value or less. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> claim 4.</p> <p><i>See also</i> Yin at [0053], [0058], [0063].</p> <p><i>See also</i> '864 Application at [0045], [0050], [0056].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

**9. Claim 9**

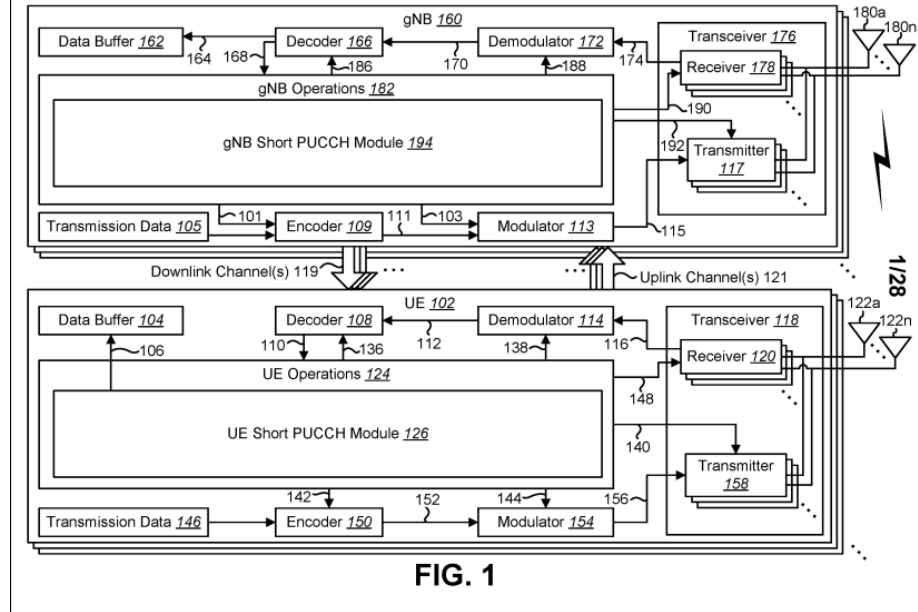
| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                        | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                          |
| 9[pre]                                                  | A user equipment (UE) for transmitting an uplink (UL) control channel and a UL data channel to a base station (BS), the UE comprising: | <p>To the extent the preamble is limiting, at least under Pegasus's apparent infringement theory, Yin discloses a user equipment (UE) for transmitting an uplink (UL) control channel and a UL data channel to a base station (BS). For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[pre].</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                                                                                                                                               | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                         |                                                                                                                                                                                                                                                                                                                                               | <p><i>See also</i> Yin at [0059].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p>                                                                                                                                                                                                                                                                                                             |
| 9[a]                                                    | a receiver configured to receive, from a BS, bandwidth part (BWP) configuration information of a BWP set composed of one or more BWPs configured for the UE and receive, from the BS, frequency hopping configuration information for a UL control channel and a UL data channel transmitted through one transmission BWP of the BWP set; and | <p>At least under Pegasus's apparent infringement theory, Yin discloses a receiver configured to receive, from a BS, bandwidth part (BWP) configuration information of a BWP set composed of one or more BWPs configured for the UE and receive, from the BS, frequency hopping configuration information for a UL control channel and a UL data channel transmitted through one transmission BWP of the BWP set. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitations 1[a] and 1[b].</p> <p>[0060] The transceiver 118 may include one or more receivers 120 and one or more transmitters 158. The one or more receivers 120 may receive signals from the gNB 160 using one or more antennas 122a-n. For example, the receiver 120 may receive and downconvert signals to produce one or more received signals 116. The one or more received signals 116 may be provided to a demodulator 114. The one or more transmitters 158 may transmit signals to the gNB 160 using one or more antennas 122a-n. For example, the one or more transmitters 158 may upconvert and transmit one or more modulated signals 156.</p> |

Invalidity of U.S. Patent No. 10,594,460 in view of Yin

Claim Language

Exemplary Citations to Yin



See also Yin at [0059].

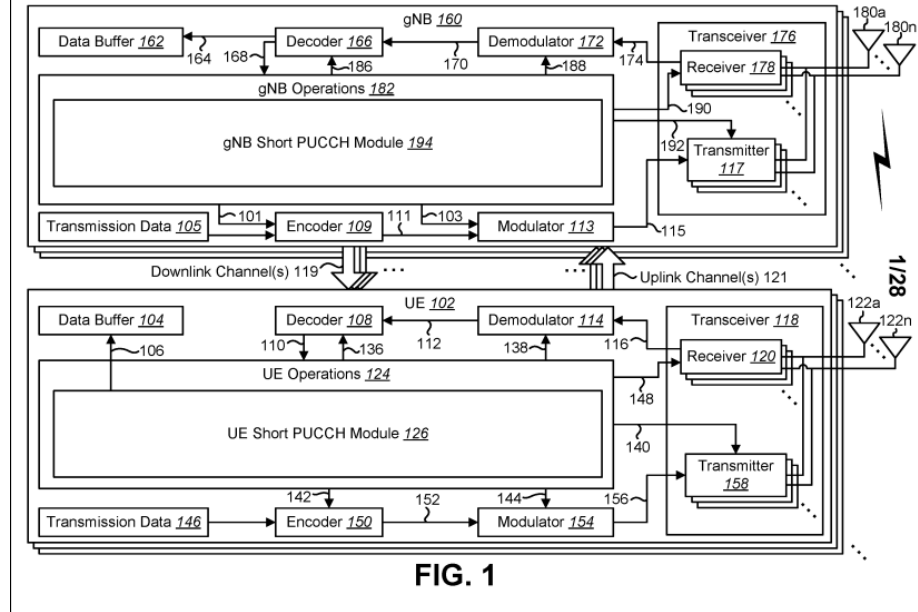
To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or 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 Yin 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.

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                        | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9[b]                                                    | a transmitter configured to transmit a UL control channel and a UL data channel to the BS through the transmission BWP based on the BWP configuration information and the frequency hopping configuration information, | <p>At least under Pegasus's apparent infringement theory, Yin discloses a transmitter configured to transmit a UL control channel and a UL data channel to the BS through the transmission BWP based on the BWP configuration information and the frequency hopping configuration information. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[c].</p> <p>[0060] The transceiver 118 may include one or more receivers 120 and one or more transmitters 158. The one or more receivers 120 may receive signals from the gNB 160 using one or more antennas 122a-n. For example, the receiver 120 may receive and downconvert signals to produce one or more received signals 116. The one or more received signals 116 may be provided to a demodulator 114. The one or more transmitters 158 may transmit signals to the gNB 160 using one or more antennas 122a-n. For example, the one or more transmitters 158 may upconvert and transmit one or more modulated signals 156.</p> |

Invalidity of U.S. Patent No. 10,594,460 in view of Yin

Claim Language

Exemplary Citations to Yin



See also Yin at [0059].

To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                                   | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 9[c]                                                    | wherein the frequency hopping configuration information for UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values, and                                                  | <p>At least under Pegasus's apparent infringement theory, Yin discloses wherein the frequency hopping configuration information for UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[d].</p> <p><i>See also</i> Yin at [0059].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |
| 9[d]                                                    | wherein a frequency hopping offset value used to transmit the UL data channel among the frequency hopping offset values included in the frequency hopping offset set is indicated by UL grant downlink control information (DCI). | <p>At least under Pegasus's apparent infringement theory, Yin discloses wherein a frequency hopping offset value used to transmit the UL data channel among the frequency hopping offset values included in the frequency hopping offset set is indicated by UL grant downlink control information (DCI). For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> limitation 1[e].</p> <p><i>See also</i> Yin at [0059].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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</p>                                                                                                                                                                                                                                                                                                                                                                                                          |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |  | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                         |  | identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine Yin 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. |

**10. Claim 10**

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                                                                                                                                                                                                                | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 10                                                      | The UE of claim 9, wherein the frequency hopping configuration information for a UL control channel includes at least one of information indicating whether to perform frequency hopping, physical resource block (PRB) allocation information of a first frequency resource region of the UL control channel, and PRB allocation information of a second frequency resource region of the UL control channel. | <p>At least under Pegasus's apparent infringement theory, Yin discloses the UE of claim 9, wherein the frequency hopping configuration information for a UL control channel includes at least one of information indicating whether to perform frequency hopping, physical resource block (PRB) allocation information of a first frequency resource region of the UL control channel, and PRB allocation information of a second frequency resource region of the UL control channel. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> claim 2.</p> <p><i>See also</i> Yin at [0059].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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</p> |

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |  |                                                                                                                |
|---------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |  | Exemplary Citations to Yin                                                                                     |
|                                                         |  | endeavor to address the same known problems, according to known methods which would yield predictable results. |

**11. Claim 11**

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                           | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 11                                                      | The UE of claim 9, wherein a number of frequency hopping offset values included in the frequency hopping offset set is determined based on a number of physical resource blocks (PRBs) constituting the transmission BWP. | <p>At least under Pegasus's apparent infringement theory, Yin discloses the UE of claim 9, wherein a number of frequency hopping offset values included in the frequency hopping offset set is determined based on a number of physical resource blocks (PRBs) constituting the transmission BWP. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> claim 3.</p> <p><i>See also</i> Yin at [0059].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |

12. Claim 12

| Invalidity of U.S. Patent No. 10,594,460 in view of Yin |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Language                                          |                                                                                                                                                                                                                                                     | Exemplary Citations to Yin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 12                                                      | The UE of claim 11, wherein the number of frequency hopping offset values included in the frequency hopping offset set is determined depending on whether the number of PRBs constituting the transmission BWP is a preset threshold value or less. | <p>At least under Pegasus's apparent infringement theory, Yin discloses the UE of claim 11, wherein the number of frequency hopping offset values included in the frequency hopping offset set is determined depending on whether the number of PRBs constituting the transmission BWP is a preset threshold value or less. For example, Yin discloses this limitation based on the following exemplary citations:</p> <p><i>See</i> claim 4.</p> <p><i>See also</i> Yin at [0059].</p> <p>To the extent it is found that Yin does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that Yin does not anticipate this claim, Yin 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 Yin 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.</p> |