

# Pegasus Wireless Innovation LLC

## March 5, 2026 Hearing Demonstratives

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***Google LLC et al. v. Pegasus Wireless Innovation LLC***

***U.S. Patent No. 10,638,463*** IPR2025-00083

# '704 Patent Cover Sheet, FIG. 3B



US010638463B2

(12) **United States Patent**  
**Park**

(10) **Patent No.:** US 10,638,463 B2  
(45) **Date of Patent:** Apr. 28, 2020

(54) **APPARATUS AND METHOD OF UPLINK CONTROL CHANNEL RESOURCE ALLOCATION FOR NEW RADIO**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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Jul. 3, 2018 (KR) ..... 10-2018-0077270

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*H04W 72/04* (2009.01)

(52) **U.S. CL**  
CPC ..... *H04W 72/0413* (2013.01); *H04W 72/042* (2013.01)

(58) **Field of Classification Search**  
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USPC ..... 370/329, 330  
See application file for complete search history.

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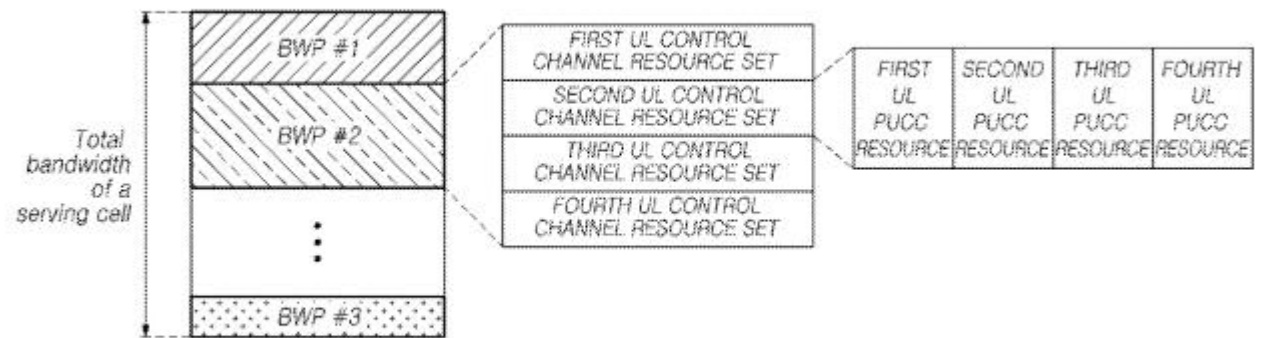
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(57) **ABSTRACT**  
Provided are a method of transmitting an uplink control information in a next-generation/5G radio access network. The method may include receiving uplink control channel resource set configuration information to transmit the uplink control information from a base station, determining one of uplink control channel resource sets contained in the uplink control channel resource set configuration information, determining one of uplink control channel resources configuring the determined uplink control channel resource set, and transmitting the uplink control information through the determined uplink control channel resource.

**9 Claims, 9 Drawing Sheets**



## (54) APPARATUS AND METHOD OF UPLINK CONTROL CHANNEL RESOURCE ALLOCATION FOR NEW RADIO

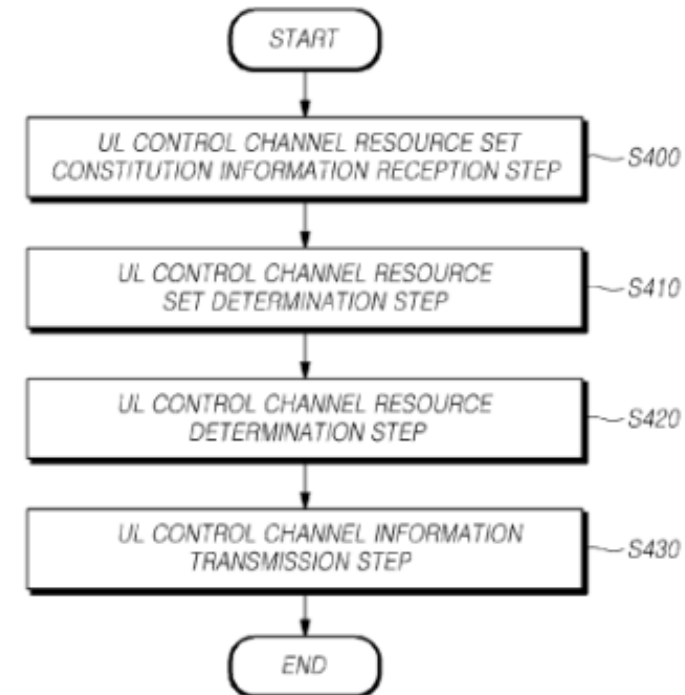


Ex. 1001 ('463 Patent)

# '463 Patent, claim 1

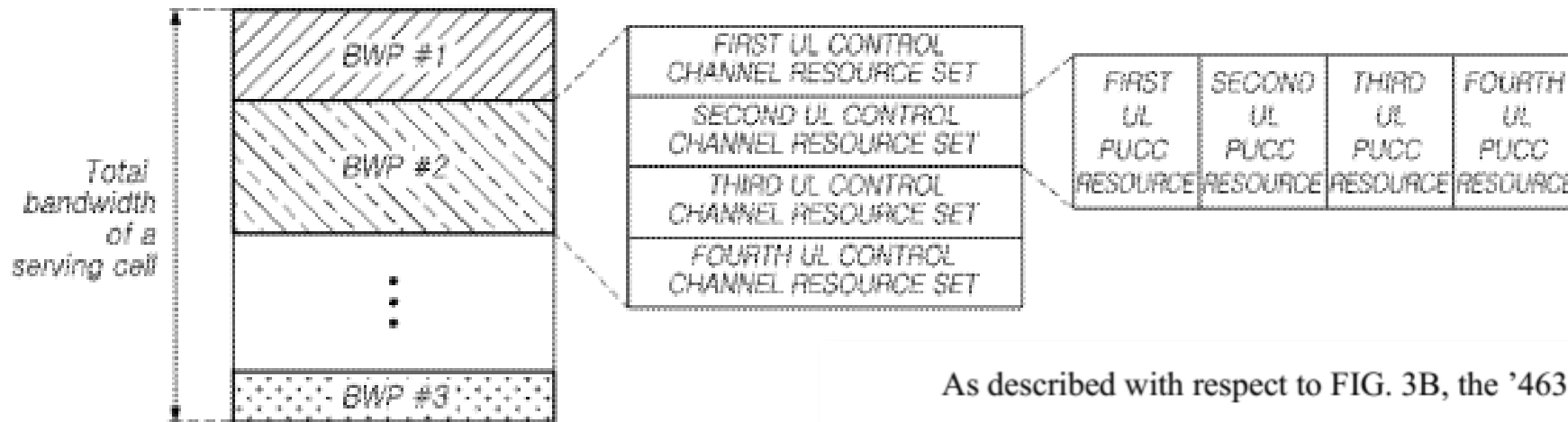
What is claimed is:

1. A method of transmitting uplink (UL) control information by a user equipment, the method comprising:  
receiving, from a base station, UL control channel resource set configuration information for UL control information transmission;  
determining one of UL control channel resource sets contained in the UL control channel resource set configuration information;  
determining one of UL control channel resources contained in the determined UL control channel resource set; and  
transmitting UL control information through the determined UL control channel resource,  
wherein the UL control channel resource sets are configured for each UL bandwidth part (BWP) configured for the user equipment, and  
wherein the each UL BWP is activated through downlink (DL) control information.



Ex. 1001 ('463 Patent), claim 1, FIG. 4; Patent Owner Response, 10-11, 7

# '463 Patent, FIG. 3B



As described with respect to FIG. 3B, the '463 patent discloses that “the BS may configure total N groups of one or multiple PUCCH resource sets *per each BWP* for a UE.” *Id.*, 9:61-63 (emphasis added). Further, “each PUCCH resource may be defined as PUCCH format configuration information, time/frequency domain PUCCH resource configuration information (or additionally code domain resource configuration information) in the UL BWP, or the like.” *Id.*, 10:6-10.

Ex. 1001 ('463 Patent), Fig. 3B; PO Response, 8

# Asserted Grounds – Ground 1

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**Petition Asserts:**

- **Ground 1:** Claims 1-9 are unpatentable under 35 U.S.C. § 103 over International Publication No. WO 2019/030929 A1 (“Takeda”) and U.S. Patent No. 10,736,085 (“Yan”)

**PO Response:**

B. The Petition’s Alleged Motivation to Insert Yan into a BWP Environment Uniformly Fails .....16

i. Yan is Focused on an Activated Spectrum Encompassing the Spectrum Bandwidth, not Configured BWPs .....16

ii. The Petition Fails to Advance Credible Reasons for Combining Takeda with Yan .....18

# Ground 1 Fails at least for Lack of Motivation

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Indeed, while Petitioner contends that multiple bases are advanced in the Petition to support this combination, the Reply fails to overcome the logical errors in these bases, as confirmed even by Petitioner's expert Dr. Roy at deposition. Absent a credible motivation to combine Takeda and Yan, Ground 1 must fail.

PO's Sur-Reply, 2

# Asserted Grounds – Ground 2

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**Petition Asserts:**

- **Ground 2:** Claims 1-9 are unpatentable under 35 U.S.C. § 103 over U.S. Patent Publ. No. 2014/0056278 (“Marinier”), Yan, and 3GPP Submission No. R1-1711853 (“R1-1711853”)

**PO Response:**

C. Ground 2 Lacks Credible Motivation and Even if Combined, the Asserted References Fail to Disclose or Suggest Every Claimed Feature .....29

## Ground 2 also Fails for Lack of Motivation

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There is no dispute that Petitioner requires a combination of Yan, Marinier, and R1-117853 to sustain its Ground 2 challenges. Because the proposed combination of Yan and Marinier is unsupported by any credible motivation, this proposed combination should be rejected and Ground 2 must fail.

PO's Sur-Reply, 17

# Petition's Theory on Combining Takeda and Yan (1/3)

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## **A. Petitioner's Backwards Network Compatibility Justification is Illogical and Unsupported by the Evidence**

The Petition first argues that its combination of Yan and Takeda is supported in order to provide backwards network compatibility. This argument is illogical, inconsistent with Petitioner's other arguments regarding network standard compliance, and unsupported by the evidence—including Petitioner's own expert testimony.

# Petition's Theory on Combining Takeda and Yan (1/3)

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¶78. Backwards compatibility *does not* mean that a POSITA would be motivated to incorporate one aspect of a previous generation's (*i.e.*, 4G LTE-standards) solution into a system designed to operate according to a newer standard (*i.e.*, 5G NR). Sharony, ¶80. Mixing standards and behaviors does not ensure backwards compatibility, and instead creates a risk that the user equipment might not comply with either standard because it is not fully compliant with either standard. *Id.*

Thus, incorporating one portion of Yan into Takeda does not ensure Takeda's 5G NRs would be able "to continue to connect with 4G LTE BSs," as alleged in the Petition. *See* Pet., 14.

PO's Sur-Reply, 5

# Petition's Theory on Combining Takeda and Yan (1/3)

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As explained in the POR, Dr. Roy conceded that he did not know whether Yan's solution for avoiding UCI mismatch was ever adopted within the 4G LTE standard, and therefore could not answer whether Yan's solution was considered desirable within the 3GPP standards community or even within 4G LTE. Ex. 2006: 92:5-22 ("But if you're asking whether the specific steps of Yan ever made it into a TS, I do not know."); *id.*, 93:1-5 (testifying that he does not know "whether the specific steps of Yan ever made it into a TS or technical specification for 5G new radio").

PO's Sur-Reply, 6

# Petition's Theory on Combining Takeda and Yan (1/3)

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Once again, this failure by Dr. Roy to know whether any aspect of Yan was adopted in 4G undercuts Petitioner's alleged motivation for backwards compatibility, and this is not rebutted in the Reply. Simply put, there is no evidentiary basis that a UE practicing Yan's technique would be able to communicate with a 4G LTE BS.

PO's Sur-Reply, 6

# Petition's Theory on Combining Takeda and Yan (1/3)

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Moreover, the Reply also expressly disputes whether Takeda “adhered to all aspects of the 5G NR framework in the first place.” Reply, 13. Thus, given Petitioner’s own dispute on whether Takeda adheres “to all aspects of the 5G NR framework,” there is no basis to support Petitioner’s proposed combination of Yan and Takeda for the purpose of ensuring backwards compatibility with 4G by 5G-standard compliant devices.

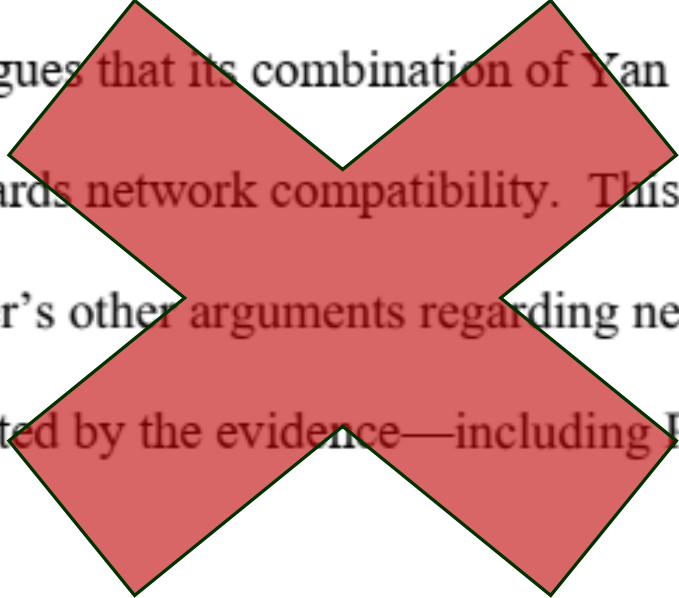
PO’s Sur-Reply, 7

# Petition's Theory on Combining Takeda and Yan (1/3)

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## **A. Petitioner's Backwards Network Compatibility Justification is Illogical and Unsupported by the Evidence**

The Petition first argues that its combination of Yan and Takeda is supported in order to provide backwards network compatibility. This argument is illogical, inconsistent with Petitioner's other arguments regarding network standard compliance, and unsupported by the evidence—including Petitioner's own expert testimony.



PO's Sur-Reply, 4

# Petition's Theory on Combining Takeda and Yan (2/3)

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## **B. Petitioner's Argument that Yan Would Avoid UCI Mismatch is Not Supported by the Evidence**

The Petition next argues that its combination of Yan and Takeda is supported by Yan's disclosure that its method avoids UCI mismatch, namely allocating UCI transmission resources that are excessive or insufficient to carry the quantity of bits required in the UCI transmission. Pet., 15-16. As a result of this mismatch, Yan discloses that "utilization of the uplink channel is relatively low or UCI bits are discarded." Yan, 1:63-2:6.

PO's Sur-Reply, 7

## Petition's Theory on Combining Takeda and Yan (2/3)

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Patent Owner's expert explained, Takeda uses UL BWPs in accordance with 5G NR, and it was well-known to POSITAs that 5G NR adopted a different solution than Yan for avoiding UCI mismatch. POR, 19, 20-21; Sharony, ¶70. Specifically, 5G NR supports multiple UCI formats (short/long;  $\leq 2$ -bit vs  $> 2$ -bit) for that exact reason. *Id.* Further, the type of uplink transmission, and the information to be transmitted (e.g. HARQ ACK/NACK, CSI), is specifically requested by the base station via DCI and/or RRC, thus avoiding UCI mismatch. *Id.*

PO's Sur-Reply, 8

## Petition's Theory on Combining Takeda and Yan (2/3)

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As explained in the POR, Dr. Roy agreed during deposition that he could not tell whether Takeda suffers from UCI mismatch in, for example, FIG. 9. Ex. 2006, 91:20-92:4 (“Q: So there's nothing about Figure 9 that would tell you whether there's a mismatch of the UCI information and uplink resources in uplink bandwidth part number 2. Is that right? ... A: No, I couldn't tell.”). Petitioner fails to rebut this argument in the Reply and offers no further declaration from Dr. Roy to explain his uncertainty regarding whether Takeda suffers from UCI mismatch. Instead, Petitioner tries to disparage Dr. Sharony's testimony without

PO's Sur-Reply, 7-8

## Petition's Theory on Combining Takeda and Yan (2/3)

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### **B. Petitioner's Argument that Yan Would Avoid UCI Mismatch is Not Supported by the Evidence**

The Petition next argues that its combination of Yan and Takeda is supported by Yan's disclosure that its method avoids UCI mismatch, namely allocating UCI transmission resources that are excessive or insufficient to carry the quantity of bits required in the UCI transmission. Pet., 15-16. As a result of this mismatch, Yan discloses that "utilization of the uplink channel is relatively low or UCI bits are discarded." Yan, 1:63-2:6.

PO's Sur-Reply, 7

# Petition's Theory on Combining Takeda and Yan (3/3)

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## **C. Petitioner's Argument that Yan Would Reduce Takeda's Power Consumption is Not Supported by the Evidence**

Third, the Petitioner argues that the combination of Yan and Takeda is supported "to reduce UE power consumption." Pet., 15-17.

As discussed in the POR, Petitioners manufacture a problem of power consumption in Takeda.

## Petition's Theory on Combining Takeda and Yan (3/3)

The Petition alleges that “a POSITA would have been motivated to use the UL resource allocation methods of Yan with 5G BWP configurations (as discussed in Takeda) to further Yan’s goal of power-efficient UL signaling.” Pet., 16-17. But given that Takeda’s CORESET and PUSCH uplinks occupy less than the full UL BWP, and Dr. Roy’s uncertainty whether Takeda even suffers from UCI mismatch (see Ex. 2006, 91:20-92:4), it is a complete guess that Yan’s methods would somehow yield a power savings in Takeda or would even address a problem in Takeda. Sharony, ¶¶73-74. Dr. Roy even conceded at deposition that comparing power efficiencies in 4G LTE and 5G NR are challenging at best. Ex. 2006, 41:10-13 (“So I don’t believe you can make a direct, you know, efficiency comparison to 4G LTE because there are various parameters that are different, notably the carrier bandwidths are different.”); *id.*, 39:9-41:17.

PO’s Sur-Reply, 11

## Petitioner's Theory on Combining Takeda and Yan (3/3)

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Thus, Petitioner's presentation of yet another fabricated reason trying to justify a combination of Yan with Takeda is tainted by the fingerprints of impermissible hindsight. There is no meaningful argument that using Yan's resource set mechanism applicable to 4G LTE could somehow yield a power savings for either CORESET monitoring or UCI transmission in Takeda's 5G-specific technology. Sharony, ¶75. In fact, Yan's adjustable scheme (which may also dynamically increase or decrease resources capacity to fit the UCI, per Yan, 22:26-50) requires more processing in the UE and therefore more power consumption. Sharony, ¶¶55, 75.

PO's Sur-Reply, 12

## Petition's Theory on Combining Takeda and Yan (3/3)

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### **C. Petitioner's Argument that Yan Would Reduce Takeda's Power Consumption is Not Supported by the Evidence**

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As discussed in the POR, Petitioners manufacture a problem of power consumption in Takeda.

PO's Sur-Reply, 10

# Takeda and Yan Would Not Have Been Combined

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The Reply also fails to rebut the express reason not to combine Yan and Takeda, as discussed in the POR. Specifically, Petitioner's proposed reason to combine Yan with Takeda overlooks Takeda's stated goal of "reduc[ing] the processing load (for example, the processing load due to blind decoding of each frequency band) in a user terminal," particularly when using BWPs in a carrier. Takeda, [0008]; Ex. 2006, 54:7-14 ("Q: Do you believe that one of Takeda's stated goals is reducing a processing load of the user terminal? A: .... So if your stated goal maps to problem addressed or solved by the invention, yes.").

PO's Sur-Reply, 13-14

# Petitioner's Reply Included No Rehabilitation Testimony

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**D. The POR's Arguments Against Combining Yan and Takeda Are Unrebutted by The Reply or Any Further Testimony from Dr. Roy**

As noted above, Dr. Roy's deposition testimony contradicted the Petition and illuminated the hindsight reasoning used to develop his opinions. Yet, the Reply advances only attorney argument without any further declaration from Dr. Roy, thus leaving his unfavorable deposition testimony unrebutted.

PO's Sur-Reply, 14

# Petition's Theory on Combining Marinier and Yan

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## **III. PETITIONER'S GROUND 2 ALSO FAILS TO PRESENT A CREDIBLE REASON TO COMBINE YAN AND MARINIER**

Spending only 1.5 pages to address the lack of credible motivation presented in the Petition, the Reply fails to include any further testimony from Dr. Roy to shore up the deficient motivation and instead attempts to manipulate Dr. Sharony's deposition testimony in its favor. But once again, motivation is first and foremost Petitioner's burden to establish, and Petitioner cannot make its case without establishing that its motivation is sound and reasonably asserted. Like in Ground 1, Petitioner fails to do so again for Ground 2.

PO's Sur-Reply, 15

# Petition's Theory on Combining Marinier and Yan

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## III. PETITIONER'S GROUND 2 ALSO FAILS TO PRESENT A CREDIBLE REASON TO COMBINE YAN AND MARINIER

Nevertheless, Petitioner argues in the Reply that Marinier's solution for avoiding collisions and conflicts in transmissions "directly supports Petitioners' argument that a POSITA would have looked to Yan to avoid the 'mismatch of UL channel resource capacity and UCI size' *which could result in such conflicts in Marinier.*" Reply, 19 (emphasis added).

PO's Sur-Reply, 15-16

# Petition's Theory on Combining Marinier and Yan

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There is no dispute among the parties that Marinier discloses using BW parts to avoid conflicts and collisions in transmissions that would otherwise occur at the same time and on the same frequency. No further art or disclosure is needed to avoid a problem that Marinier has already solved. Nevertheless, Petitioner argues in the Reply that Marinier's solution for avoiding collisions and conflicts in transmissions "directly supports Petitioners' argument that a POSITA would have looked to Yan to avoid the 'mismatch of UL channel resource capacity and UCI size' *which could result in such conflicts in Marinier.*" Reply, 19 (emphasis added). This argument, frankly, makes no sense. UCI transmissions, if they occur in Marinier, cannot result in conflicts because Marinier has a solution to avoid those conflicts.

PO's Sur-Reply, 16

# Petition's Theory on Combining Marinier and Yan

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## III. PETITIONER'S GROUND 2 ALSO FAILS TO PRESENT A CREDIBLE REASON TO COMBINE YAN AND MARINIER

Nevertheless, Petitioner argues in the Reply that Marinier's solution for avoiding collisions and conflicts in transmissions "directly supports Petitioners' argument that a POSITA would have looked to Yan to avoid the 'mismatch of UL channel resource capacity and UCI size' *which could result in such conflicts in Marinier.*" Reply, 19 (emphasis added).

PO's Sur-Reply, 15-16