

Table 1: Comparing Select Sections of Almeroth Declaration to Corresponding Sections of Petition

Section/Topic	Almeroth Declaration (EX1002)	Petition re: '177 Patent								
Grounds for Unpatentability: Background	<p>V. Ground 1: Chincholi in Combination With Riggert Renders Claims 1-2, 13-30 Obvious</p> <table><tr><th>Ground</th><th>Basis</th><th>Reference</th><th>Claims</th></tr><tr><td>1</td><td>§103</td><td>WO 2013/126859 ("Chincholi") in combination with U.S. Patent 9,055,592 ("Clegg")</td><td>1-26</td></tr></table> <p>A. Background</p> <p>69. In my opinion, Chincholi in combination with Clegg renders claims 1-26 obvious. As I explain below, Chincholi teaches the same architecture as the '177 patent, including a wireless networking device with multiple transceivers, each having actual MAC and PHY interfaces. Chincholi uses a single "Opportunistic Multiple-Medium Access Control (MAC) Aggregation layer," positioned above the actual MAC-PHY layers of each transceiver, to aggregate available bandwidth portions to efficiently meet the requirements of data streams from one or more applications. (EX1005 at [0122-0123]).</p> <p>EX1002 ¶ 69 (identical image omitted).</p>	Ground	Basis	Reference	Claims	1	§103	WO 2013/126859 ("Chincholi") in combination with U.S. Patent 9,055,592 ("Clegg")	1-26	<p>VII. GROUND 1: Chincholi in Combination with Clegg Renders Claims 1-26 Obvious¹</p> <p>A. Overview and Motivation to Combine</p> <p>Chincholi in combination with Clegg renders claims 1-26 obvious. (EX1002, ¶69). As discussed in more detail below, Chincholi teaches the same architecture as the '177 patent, including a wireless networking device with multiple transceivers, each having actual MAC and PHY interfaces. Chincholi uses a single "Opportunistic Multiple-Medium Access Control (MAC) Aggregation layer," positioned above the actual MAC-PHY layers of each transceiver, to aggregate available bandwidth portions to efficiently meet the requirements of data streams from one or more applications. (EX1005, [0122-0123].)</p> <p>Petition at 9-10 (identical image omitted).</p>
	Ground	Basis	Reference	Claims						
	1	§103	WO 2013/126859 ("Chincholi") in combination with U.S. Patent 9,055,592 ("Clegg")	1-26						
	<p>70. Chincholi also teaches the continuous monitoring of the "number of available resources on the medium," along with techniques for distributing IP packets across multiple RATs based on this information. (EX1005 at [0161]). This approach allows the system to dynamically respond to changes in bandwidth availability, including situations where entire channels or portions of channels become unavailable during the transmission of a data stream.</p> <p>71. A POSITA would have understood that Chincholi's monitoring and response techniques could be further enhanced by incorporating the teachings of Clegg. Clegg discloses techniques for mitigating carrier-specific interference within</p>	<p>Chincholi teaches continuous monitoring of the "number of available resources on the medium" and techniques for distributing IP packets across the RATs accordingly. (EX1005, [0161].) Chincholi's approach enables the system to respond to bandwidth channels, or portions of bandwidth channels, becoming unavailable during transmission of a data stream. (EX1002, ¶70.) A POSITA would have understood that Chincholi's monitoring and response techniques could be</p>								

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	<p>bandwidth channels, thereby allowing each channel to make full use of the portions of bandwidth that remain available for communication. Like Chincholi, Clegg is directed to the field of 802.11 wireless communication networks and is aimed at improving bandwidth efficiency. (EX1009 at 1:25–37).</p> <p>EX1002 ¶¶ 70-71.</p> <p>72. A POSITA would have been motivated to incorporate the teachings of Clegg to enhance the Chincholi system by enabling more flexible and efficient utilization of bandwidth channels that may be subject to carrier-specific interference. Chincholi already teaches the dynamic allocation of contiguous and non-contiguous channels, and Clegg supplements this by providing additional techniques for mitigating interference within a given channel. The teachings of Clegg are complementary to those of Chincholi, and a POSITA would have recognized that integrating Clegg's techniques into the Chincholi system could be achieved without technical difficulty and with a reasonable expectation of success.</p> <p>73. In my analysis below, the combined prior art system will be referred to as Chincholi/Clegg.</p> <p>EX1002 ¶¶ 72-73.</p>	<p>further enhanced by the teachings of Clegg. (EX1002, ¶71.) Clegg teaches techniques for addressing carrier-specific interference within bandwidth channels, allowing for any given channel full usage of the channel bandwidth that is not unavailable for communication. Like Chincholi, Clegg arises in the field 802.11 wireless communication networks and is addressed to increasing bandwidth efficiency. (EX1009, 1:25-37.)</p> <p>Petition at 10-11.</p> <p>A POSITA would have been motivated to incorporate the teachings of Clegg to improve the Chincholi system by allowing it to more flexibly and efficiently utilize available bandwidth channels that may experience carrier-specific interference within the channels. (EX1002, ¶72.) Chincholi already teaches dynamic allocation of contiguous or non-contiguous channels, and Clegg merely provides additional detail on how to mitigate carrier-specific interference within any given channel. (<i>Id</i>) The teachings of Clegg are complementary to Chincholi, and a POSITA would have recognized that Clegg's teachings could be easily implemented into Chincholi without technical challenge. (<i>Id</i>)</p> <p>In the analysis below, the combined prior art system will be referred to as Chincholi/Clegg. (EX1002, ¶73).</p> <p>Petition at 11.</p>

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<p>Grounds for Unpatentability:</p> <p>Preamble</p>	<p>B. Limitation-By-Limitation Analysis</p> <p>1. Claim 1</p> <p>a) 1[pre]: A method of improving the performance of circuitry, comprising the steps of:</p> <p>74. In my opinion, to the extent the preamble is deemed limiting, the combination of Chincholi and Clegg discloses this limitation. Chincholi describes “[s]ystems, methods, and instrumentalities . . . for managing multiple radio access technology (RAT) interfaces . . .” (EX1005, Abstract; [0003]) and further teaches systems configured “[to] enable opportunistic RAT selection and aggregation for sending data traffic over the RAT interfaces.” (EX1005 at [0003]). Additionally, Chincholi explains that in multi-RAT systems, “reception and/or transmission may be performed over multiple RATs,” and provides an example in which a network terminal (NT) (e.g., an access point) and a wireless transmit/receive unit (WTRU) communicate “over multiple parallel paths.” (EX1005 at [0002]).</p> <p>75. Chincholi also discloses that a network terminal (“NT”), such as an access point, or a wireless transmit/receive unit (“WTRU”) “may be configured to work in an infrastructure mode or an ad hoc mode, for example, in an IEEE 802.11 based Wi-Fi system”—i.e., both constitute wireless networking devices. (EX1005 at [0115]). A POSITA would have understood that the techniques disclosed in Chincholi, including those enhanced by Clegg, would improve the performance of the circuitry comprising the disclosed network terminals. Accordingly, as further discussed in the following limitations, the Chincholi/Clegg combination discloses a method for improving the performance of circuitry.</p> <p>EX1002 ¶¶ 74-75.</p>	<p>B. Limitation-By-Limitation Analysis</p> <p>1. Claim 1</p> <p>a) 1[pre]: A method of improving the performance of circuitry, comprising the steps of:</p> <p>To the extent the preamble is limiting, Chincholi/Clegg discloses this limitation. (EX1002, ¶¶74-75.) Chincholi discloses “[s]ystems, methods, and instrumentalities . . . for managing multiple radio access technology (RAT) interfaces . . .” (EX1005, Abstract; [0003]) and “[to] enable opportunistic RAT selection and aggregation for sending data traffic over the RAT interfaces.” (EX1005, [0003].) “In multi-RAT systems reception and/or transmission may be performed over multiple RATs. For example, a network terminal (NT) (e.g., an access point (AP) . . .) and a wireless transmit/receive unit (WTRU) . . . may communicate over multiple parallel paths.” (EX1005, [0002].)</p> <p>Chincholi discloses that a network terminal (“NT”), such as an access point, or a wireless transmit/receive unit (“WTRU”) “may be configured to work in an infrastructure mode or an adhoc mode, for example, in an IEEE802.11 based Wi-Fi system,” i.e., both are a wireless networking device. (EX1005 [0115].) A POSITA would have understood that Chincholi’s techniques would have improved the performance of the circuitry comprising the disclosed network terminals. (EX1002, ¶75.)</p> <p>Thus, as discussed in the below limitations, Chincholi/Clegg discloses a method for improving the performance of circuitry. (<i>Id.</i>)</p> <p>Petition at 12-13.</p>

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<p>Grounds for Unpatentability:</p> <p>Claim 1(a)</p>	<p>b) 1[a]: providing a processing interface that is adapted to be connected to an application interface of a wireless networking device, the application interface being associated with a first application, the first application providing, after the circuitry has been connected to the application interface and when the wireless networking device is being used, a first data stream and having a first wireless bandwidth requirement;</p> <p>76. In my opinion, Chincholi/Clegg discloses this limitation.</p> <p>77. "providing a processing interface that is adapted to be connected to an application interface of a wireless networking device": Chincholi discloses a processing interface connected to an application interface. Specifically, Chincholi identifies <i>its processing interface</i> as the "Opportunistic Multiple-Medium Access Control (MAC) Aggregation (OMMA) layer." (EX1005 at [0003].) A POSITA would have understood that the plain meanings of "interface" and "layer" in the context of the '143 patent are functionally congruent. This understanding is reinforced by the specification, which describes layers performing the same functionality as the claimed interfaces, as well as by the prosecution history of the prior related '591 patent, where the Applicant used the terms "layer" and "interface" interchangeably in reference to Figure 1. (EX1017, at Aug. 8, 2023 Applicant Remarks; Sep. 28, 2023 Applicant Remarks.)</p> <p>78. The OMMA layer functions as a common layer or module situated between the IP layer/module and the multiple RAT layers/modules. (EX1005 at [0137]; <i>see also id.</i> at [0120] ("[T]he single thin software layer may enable one RAT to operate over industrial scientific medical (ISM) and another RAT to operate over a TVWS band for the same IP flow.")). An exemplary OMMA layer that enables a dual-RAT aggregation device in an 802.11n network is illustrated in Figure 5 of Chincholi.</p>	<p>b) 1[a]: providing a processing interface that is adapted to be connected to an application interface of a wireless networking device, the application interface being associated with a first application, the first application providing, after the circuitry has been connected to the application interface and when the wireless networking device is being used, a first data stream and having a first wireless bandwidth requirement;</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶76-81.)</p> <p>"providing a processing interface that is adapted to be connected to an application interface of a wireless networking device"</p> <p>Chincholi discloses a <i>processing interface</i> connected to an <i>application interface</i>. Chincholi's <i>processing interface</i> is its "Opportunistic Multiple-Medium Access Control (MAC) Aggregation (OMMA) layer." (EX1005, [0003].) A POSITA would have understood that the plain meanings of "interface" and "layer" in the context of the '143 patent are congruent, which is underscored by the specification describing layers having the same functionality as the claimed interfaces, and the prosecution history of the prior related '591 patent, where Applicant interchangeably used the terms "layer" and "interface" to describe Figure 1. (See EX1002, ¶77; EX1017, Aug. 8, 2023 Applicant Remarks; Sep. 28, 2023 Applicant Remarks.)</p> <p>The OMMA layer is a common layer/module between the IP layer/module and the multiple RAT layers/modules. (EX1002, ¶78; EX1005, [0137]; <i>see also id.</i> [0120] ("[T]he single thin software layer may enable one RAT to operate over industrial scientific medical (ISM) and another RAT to operate over a TVWS band for the same IP flow.")) An exemplary OMMA layer enabling a dual-RAT aggregation device in a 802.11n network is shown in Figure 5:</p>

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	<p>79. The IP layer—functioning as the “application interface,” as discussed below—is connected to the OMMA layer and provides IP packets for processing. (EX1005 at [0137]). Chincholi explains that the OMMA layer “may allow for enhanced throughput and reduced latency for a single IP flow.” (EX1005 at [0120]). Accordingly, the OMMA layer operates as a processing layer that handles IP packets and serves as an interface between the IP layer and the underlying MAC layers—<i>i.e.</i>, it functions as a <i>processing interface</i>.</p> <p>EX1002 ¶¶ 76-79 (identical figure omitted).</p> <p>81. “first application ... having a first wireless bandwidth requirement”: Chincholi teaches “a bandwidth requirement for an IP flow.” (EX1005, at [260]).</p> <p>EX1002 ¶ 81.</p>	<p>The IP layer (<i>i.e.</i>, an “application interface,” as discussed below) is connected to the OMMA layer and provides IP packets that the OMMA layer processes. (EX1005, [0137]); (EX1002, ¶79.) The OMMA “may allow for enhanced throughput and reduced latency for a single IP flow.” (EX1005, [0120].) The OMMA layer is therefore a processing layer, which processes IP packets and provides an <i>interface</i> between the IP layer and actual MAC layers, <i>i.e.</i>, a <i>processing interface</i>.</p> <p>Petition at 14-15 (identical figure omitted) .</p> <p>“first application ... having a first wireless bandwidth requirement”</p> <p>Chincholi teaches “a bandwidth requirement for an IP flow.” (EX1002, ¶81; EX1005, [260].)</p> <p>Petition at 16.</p>
<p>Grounds for Unpatentability:</p> <p>Claim 1(b)</p>	<p>c) 1(b): connecting first, second and third actual MAC interfaces to the processing interface;</p> <p>82. In my opinion, Chincholi/Clegg discloses this limitation. Chincholi discloses first, second, and third <i>actual MAC interfaces</i> connected to the processing interface—<i>i.e.</i>, the common OMMA layer. For example, Figure 5 depicts a “dual-RAT aggregation” in which the OMMA layer sits above and connects to two RATs, 501a and 501b, each comprising a MAC interface 502 (EX1005 at [0138] (“<i>The RATs 501a, 501b may comprise a MAC layer/module 502 and one or more physical layers/modules 503</i>”))).</p>	<p>c) 1(b): connecting first, second and third actual MAC interfaces to the processing interface;</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶82-84.) Chincholi discloses first, second, and third <i>actual MAC interfaces</i> connected to the processing interface (<i>i.e.</i>, the common OMMA layer.) (EX1002, ¶82.) Figure 5, for example, depicts a “dual-RAT aggregation” with the common OMMA layer existing above and connected to two RATs 501a and 501b, which comprise first and second actual MAC interfaces 502, respectively, (EX1005, [0138] (“<i>The RATs 501a, 501b may comprise a MAC layer/module 502 and one or more physical layers/modules 503</i>.”))).</p>

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	<p>83. While Figure 5 depicts only the first and second actual MAC interfaces, Chincholi discloses that an 802.11 implementation may include any number of MAC interfaces. For instance, Figure 4—which presents a more general block diagram of the architecture illustrated in Figure 5—shows the OMMA layer positioned above and interfacing with an arbitrary number of RATs, thereby supporting configurations with more than two MAC interfaces.</p> <p>84. Consistent with Figures 4 and 5, Chincholi explains that a given “RAT 401” can comprise a “PHY/MAC,” meaning it includes an actual MAC interface (EX1005 at [0135]). A POSITA would have understood that, in a typical 802.11 implementation, each of the three RATs would include both actual MAC and PHY interfaces.</p> <p>EX1002 ¶¶ 82-84 (identical figures omitted).</p>	<p>While Figure 5 depicts only first and second actual MAC interfaces, Chincholi discloses that there can be any number of MAC interfaces in an 802.11 implementation. (EX1002, ¶83.) For example, Figure 4—a more general block diagram of the architecture set forth in Figure 5—depicts the OMMA layer existing above any number of RATs.</p> <p>Consistent with Figures 4 and 5, Chincholi explains that a given “RAT 401” can comprise a “PHY/MAC,” i.e. includes an actual MAC interface. (EX1005, [0135].) A POSITA would have understood that in a typical 802.11 implementation, each one of the three RATs would have actual MAC and PHY interfaces. (EX1002, ¶84.)</p> <p>Petition at 16-18 (identical figures omitted).</p>
<p>Grounds for Unpatentability: Claim 1(c)</p>	<p>d) 1[c]: connecting first and second actual PHY connecting first, second and third actual PHY interfaces respectively to the first, second and third actual MAC interfaces;</p> <p>85. In my opinion, Chincholi/Clegg discloses this limitation. Each RAT in Chincholi comprises <i>one or more physical layers</i> (EX1005 at [0138] (“The RATs 501a, 501b may comprise a MAC layer/module 502 and <i>one or more physical layers/modules 503</i>”)). The actual PHY layers are respectively connected to the corresponding actual MAC interfaces.</p> <p>86. As I discussed above for limitation 1[b], Chincholi Figure 4 and its accompanying description disclose a common OMMA layer positioned above any number of RATs. In the context of an 802.11 system, each RAT depicted in Figure 4 would correspond to an actual MAC-PHY pair, thereby disclosing the connection of first, second, and third actual PHY interfaces to corresponding first, second, and third actual MAC interfaces (EX1005 at [0135]).</p>	<p>d) 1[c]: connecting first and second actual PHY connecting first, second and third actual PHY interfaces respectively to the first, second and third actual MAC interfaces;</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶85-86.) Each RAT in Chincholi comprises <i>one or more physical layers</i>. (EX1005, [0138] (“The RATs 501a, 501b may comprise a MAC layer/module 502 and <i>one or more physical layers/modules 503</i>.”)) The actual PHY layers are respectively connected to the actual MAC interfaces. (EX1002, ¶85.)</p> <p>As discussed above, limitation 1[b], Chincholi Figure 4 and its associated description disclose a common OMMA layer existing above any number of RATs. In an 802.11 system, each RAT shown in Figure 4 would correspond to an actual MAC-PHY pair, thus disclosing connecting first, second and third actual PHY interfaces to first, second, and third actual MAC interfaces. (EX1005, [0135]);</p> <p>Petition at 19 (identical figure omitted).</p>

Comparison of Almeroth Decl. (Ex. 1002) vs. Petition
Identical, Minor Changes, Paraphrased

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Patent Owner XiFi’s Exhibit 2006, Page 7

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	EX1002 ¶¶ 85-86 (identical figure omitted).	
<p>Grounds for Unpatentability:</p> <p>Claim 1(d)</p>	<p>e) 1[d]: respectively associating first, second and third wireless transceivers with the first, second and third actual PHY interfaces, wherein each of the first, second and third wireless transceivers is suitable for use in a wireless local area network, and the first, second and third wireless transceivers, respectively, (i) have a first, second and third bandwidth availability up to first, second and third actual bandwidths, and (ii) are adapted to emit radio signals in first, second and third bands of frequencies, at least two of the first, second and third bands of frequencies being different;</p> <p>87. In my opinion, Chincholi/Clegg discloses this limitation.</p> <p>88. <i>“associating first, second, and third wireless transceivers respectively with the first, second, and third actual PHY interfaces ... suitable for use in a wireless local area network”</i>: Chincholi Figures 4 and 5 illustrate that each actual PHY interface of each RAT is associated with an antenna/radio frequency (RF) front-end pair (EX1005 at [0133]). The antenna/RF front-end pairs shown in Figures 4 and 5 correspond to first, second, and third transceivers.</p> <p>89. In my opinion, a POSITA would have understood a “transceiver” to be a physical device capable of both transmitting and receiving information. Accordingly, each of Chincholi’s disclosed “antenna/RF front-end pairs” qualifies as a transceiver, as they operate using wireless protocols that support bidirectional communication, such as IEEE 802.11, IEEE 802.11ac, IEEE 802.11af, LTE, and WCDMA (EX1005 at [0134]). A POSITA would have further understood that the transceivers depicted in Figures 4 and 5 are associated with the actual PHY layer of each respective RAT, since the PHY layer serves as the physical connection between the transceiver hardware and the remainder of the RAT stack.</p>	<p>e) 1[d]: respectively associating first, second and third wireless transceivers with the first, second and third actual PHY interfaces, wherein each of the first, second and third wireless transceivers is suitable for use in a wireless local area network, and the first, second and third wireless transceivers, respectively, (i) have a first, second and third bandwidth availability up to first, second and third actual bandwidths, and (ii) are adapted to emit radio signals in first, second and third bands of frequencies, at least two of the first, second and third bands of frequencies being different;</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶87-94.)</p> <p><i>“associating first, second, and third wireless transceivers respectively with the first, second, and third actual PHY interfaces ... suitable for use in a wireless local area network”</i></p> <p>Chincholi Figures 4 and 5 illustrate how each actual PHY interface of each RAT is associated with an antenna/radio frequency (RF) front-end pair. (EX1005, [0133].) The antenna/radio frequency (RF) front-end pairs in Figures 4 and 5 include first, second, and third transceivers. (EX1002, ¶88.)</p> <p>A POSITA would have understood that a “transceiver” is a physical device that can both transmit and receive information. (EX1002, ¶89.) Thus, each of Chincholi’s disclosed “antenna/RF front-end pairs” are a transceiver because they operate on wireless protocols that both transmit and receive data, such as IEEE802.11, IEEE802.11ac, IEEE802.11af, LTE, WCDMA, etc. (Ex. 1005, [0134].) A POSITA would have further understood that the transceivers in Figures 4 and 5 would be associated with the actual PHY layer of each respective RAT, as the PHY layer is understood as the physical connection between a transceiver and the rest of the RAT. (<i>Id.</i>)</p>

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	<p>90. Chincholi also teaches that each RAT may be implemented as a Wi-Fi RAT, and therefore the associated transceivers are suitable for use in a wireless local area network (WLAN) (EX1005 at [0134]).</p> <p>EX1002 ¶¶ 87-90 (identical figure omitted).</p> <p>91. <i>“the first, second and third wireless transceivers, respectively, (i) have a first, second and third bandwidth availability up to first, second and third actual bandwidths”</i>: The plain meaning of this limitation is that each of the wireless transceivers, respectively, has a single bandwidth availability up to an actual bandwidth. Indeed, the Patent Owner has alleged in the parallel litigation that this limitation may be satisfied where each of the three wireless transceivers has one respective bandwidth availability extending up to an actual bandwidth (EX1013 at 19–20).</p> <p>92. Consistent with the Patent Owner’s infringement contentions, a POSITA would have understood that each transceiver has an “actual” bandwidth—i.e., the total bandwidth capacity of the transceiver—with a “bandwidth availability” that may constitute a subset of that total bandwidth (i.e., the portions of the total bandwidth currently available for use). As Chincholi teaches, the RATs associated with each transceiver provide “meta-data feedback” that allows the OMMA layer to distribute IP packets among the RATs based on their available bandwidth (EX1005 at [0138]; [0161] (listing “Channel bandwidth(s)” reported by the PHY layer as an example of a “feedback metric[] used by an OMMA layer”); <i>see also id.</i> at [0167] (“At startup, the OMMA layer may receive the available bandwidth of each of the one or more RATs.”)). Thus, Chincholi discloses that each of the three transceivers has a bandwidth availability that is up to its respective actual bandwidth.</p> <p>EX1002 ¶¶ 91-92.</p>	<p>Chincholi also teaches that each RAT may implemented as a Wi-Fi RAT, and thus their associated transceivers are suitable for use in a wireless local area network. (Ex. 1005, [0134]; EX1002, ¶90.)</p> <p>Petition at 20-22 (identical figure omitted).</p> <p><i>“the first, second and third wireless transceivers, respectively, (i) have a first, second and third bandwidth availability up to first, second and third actual bandwidths”</i></p> <p>The plain meaning of this limitation is that each of the wireless transceivers, respectively, has a single bandwidth availability up to an actual bandwidth. (EX1002, ¶91.) Indeed, Patent Owner has alleged in the parallel litigation that this limitation may be met by each of the three wireless transceivers having one respective bandwidth availability up to an actual bandwidth (<i>Id.</i>; EX1013, 19-20.)</p> <p>Consistent with PO’s infringement contentions, a POSITA would have recognized that each transceiver has an “actual” bandwidth (i.e., total bandwidth of the transceiver) with a “bandwidth availability” that may be a subset of the actual bandwidth (i.e., sub-portions of the total bandwidth that are available for use.) (EX1002, ¶92.) Indeed, as Chincholi teaches, the RATs associated with each transceiver provide “meta-data feedback” allowing the OMMA layer to split IP packets amongst the RATs based on their available bandwidth. (EX1005, [0138]; [0161] (listing “Channel bandwidth(s)” sent by the PHY layer as an example of “feedback metric[] used by an OMMA layer”); <i>id.</i>, [0167] (“At startup, the OMMA layer may receive the available bandwidth of each of the one or more RATs.”)). Thus, Chincholi discloses that each of the three transceivers has a bandwidth availability up to an actual bandwidth.</p> <p>Petition at 22-23.</p>

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	<p>93. <i>"the first, second and third wireless transceivers, respectively... (ii) are adapted to emit radio signals in first, second and third bands of frequencies, at least two of the first, second and third bands of frequencies being different":</i> The plain meaning of this limitation is that each of the three transceivers emits radio waves in its own respective frequency band. Indeed, the Patent Owner has interpreted this limitation to require only that each transceiver operate within a single, mutually exclusive frequency band. For example, in its infringement contentions, the Patent Owner asserts that this limitation is satisfied by the implementation of the Wi-Fi 7 Draft Standard, where "[t]he first transceiver is the 2.4 GHz transceiver," the second is "one of the 5 GHz and 6 GHz transceivers," and the third is "the other one of the 5 GHz and 6 GHz transceivers" (EX1013 at 19).</p> <p>94. In Chincholi, the transceivers of each RAT are adapted to emit radio waves in respective, different frequency bands, consistent with the Patent Owner's infringement contentions. In the context of Figure 4, Chincholi discloses that "[f]or multiple RATs 401, each RAT 401 may be operating on a specific band. For example, a 802.11n PHY/MAC operating over [the] 2.4 GHz ISM band, a 802.11af PHY/MAC operating over [the] 512 MHz–698 MHz TVWS band, an LTE RAT operating [on] a licensed band (e.g., 700 MHz band), a Bluetooth RAT operating on [the] 2.4 GHz ISM band, etc." (EX1005 at [0135]). Accordingly, a POSITA would understand that Chincholi discloses this limitation as interpreted by the Patent Owner.</p> <p>EX1002 ¶¶ 93-94.</p>	<p><i>"the first, second and third wireless transceivers, respectively... (ii) are adapted to emit radio signals in first, second and third bands of frequencies, at least two of the first, second and third bands of frequencies being different"</i></p> <p>The plain meaning of this limitation is that each of the three transceivers emit radio waves in its own respective frequency band. (EX1002, ¶93.) Indeed, Patent Owner, has read this limitation to only require that each transceiver emit on a single, mutually exclusive frequency band. For example, in its infringement contentions, Patent Owner alleges that this limitation is met by implementation of the Wi-Fi 7 Draft Standard where "[t]he first transceiver is the 2.4 GHz transceiver," the second is "one of the 5 GHz and 6 GHz transceivers" and the third is "the other one of the 5 GHz and 6 GHz transceivers." (<i>Id.</i>; EX1013, 19.)</p> <p>In Chincholi, the transceivers of each RAT are adapted to emit radio waves in respective different bands of frequencies, consistent with PO's infringement contentions. In the context of Figure 4, Chincholi discloses that "[f]or multiple RATs 401, each RAT 401 may be operating on a specific band. For example, a 802.11n PHY/MAC operating over 2.4GHz ISM band, a 802.11af PHY/MAC operating over 512 MHz-698 MHz TVWS band, an LTE RAT operating of a licensed band (e.g., 700 MHz band), a Bluetooth RAT operating on 2.4 GHz ISM band, etc." (EX1005, [0135].) Thus, a POSITA would understand that Chincholi discloses this limitation under PO's interpretation. (EX1002, ¶94.)</p> <p>Petition at 23-24.</p>

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<p>Grounds for Unpatentability:</p> <p>Claim 1(e)</p>	<p>f) 1[e]: forming in the processing interface (i) at least one virtual MAC interface and (ii) at least one resource monitoring interface that, after the circuitry has been connected to the application interface and during operation of the wireless networking device, feeds information regarding the bandwidth availabilities of the first, second and third wireless transceivers back to the at least one virtual MAC interface;</p> <p>95. In my opinion, Chincholi/Clegg discloses this limitation. According to the '177 patent, the virtual MAC layer “enable[s] simultaneous allocation of multiple PHY resources for different signal types associated with different applications” (EX1001 at 3:51–54). The patent further states that the virtual MAC layer comprises the functionality of “decision,” “processing,” and “ultra-streaming” blocks (EX1001 at 3:49–50). Notably, the patent does not disclose or describe a generic “resource monitoring interface,” which—as discussed above in Section IV.A.3—was introduced into the claim language as a replacement for the originally recited “virtual PHY interfaces” through a post-Notice of Allowance (NOA) broadening amendment (EX1004 at June 18, 2024 Request for Continued Examination with Preliminary Amendment).</p> <p>96. The '177 patent describes the “virtual PHY layer” as potentially including multiple RF blocks, with each RF block representing the virtual use of a particular set of allocated transceiver resources (EX1001 at 4:51-54; see also Fig. 3 (depicting two RF blocks associated with “two sets” of transceiver resources)). The patent further explains that “[b]y employing a virtual MAC and virtual PHY between an application layer and an actual MAC and PHY layer, wireless transceiver resources may be allocated more efficiently to handle various data bandwidth requirements from different applications” (EX1001 at 6:4-8).</p> <p>EX1002 ¶¶ 95-96.</p>	<p>f) 1[e]: forming in the processing interface (i) at least one virtual MAC interface and (ii) at least one resource monitoring interface that, after the circuitry has been connected to the application interface and during operation of the wireless networking device, feeds information regarding the bandwidth availabilities of the first, second and third wireless transceivers back to the at least one virtual MAC interface;</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶95-103.) According to the '177 patent, the virtual MAC layers “enable[s] simultaneous allocation of multiple PHY resources for different signal types associated with different applications.” (EX1001, 3:51-54.) The patent states that the virtual MAC layer comprises the functionality of “decision,” “processing,” and “ultra streaming” blocks. (EX1001, 3:49-50.) The patent does not disclose or describe a generic “resource monitoring interface” (EX1002, ¶95), which as discussed above, <i>supra</i> Section IV.A.3, was added to the claim to replace the originally recited “virtual PHY interfaces” in a post-NOA broadening amendment (EX1004, June 18, 2024 Request for Continued Examination with Preliminary Amendment).</p> <p>The patent’s description of the “virtual PHY layer” provides that a virtual PHY may include multiple RF blocks, each representing the virtual use of some set of allocated transceiver resources. (EX1001, 4:51-54; see also Fig. 3 (depicting two RF blocks associated with “two sets” of transceiver resources.)) “By employing a virtual MAC and virtual PHY between an application layer and an actual MAC and PHY layer, wireless transceiver resources may be allocated more efficiently to handle various data bandwidth requirements from different applications.” (EX1001, 6:4-8; EX1002, ¶96.)</p> <p>Petition at 24-25.</p>

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	<p>97. First, Chincholi discloses that the OMMA layer (<i>i.e.</i>, the processing interface) includes the claimed “virtual MAC interface” formed within it. “OMMA” stands for “opportunistic multi-medium access control (MAC) aggregation,” reflecting its function of aggregating multiple MAC interfaces, as shown in Figure 5 (EX1005 at [0120]). The OMMA layer functions as a virtual MAC interface because it transparently “distributes and/or combines” packets between the IP layer and the RATs (EX1005 at [0192]). A POSITA would have recognized that this functionality effectively “virtualizes” the MAC interface, as the OMMA layer appears to the IP layer as a single interface for exchanging packets that are ultimately transmitted or received via the underlying MAC-PHY pairs.</p> <p>98. Chincholi’s OMMA layer also includes all of the functionality that the '177 patent attributes with the “virtual MAC interface.” For example, Figure 6 of Chincholi (reproduced below with annotations) presents a block diagram of the OMMA layer, which comprises an IP QoS Scheduler 603, a MAC Resource Reservation module 602, and a Traffic Shaping Module 601 (EX1005 at [0139]).</p> <p>EX1002 ¶¶ 97-98 (identical figure omitted).</p> <p>99. The IP QoS Scheduler classifies incoming packets of a packet stream and may segregate them into distinct IP QoS streams (EX1005 at [0143]), which a POSITA would have recognized as fulfilling the functionality of the “decision</p>	<p>First, Chincholi discloses that the OMMA (<i>i.e.</i>, the processing interface) includes the claimed “virtual MAC interface” formed within it. Indeed, “OMMA” is an abbreviation for “opportunistic multi-medium access control (MAC) aggregation,” which refers to the fact that the OMMA layer aggregates multiple MAC interfaces, as depicted in Figure 5. (EX1005, [0120].) The OMMA layer includes an interface acting as a “virtual MAC interface” because it transparently “distributes and/or combines” packets between the IP layer and the RATs. (EX1005, [0192].) A POSITA would have recognized that this “virtualizes” a MAC interface because the OMMA would effectively appear to the IP layer as a single interface for exchanging packets that are ultimately sent or received by the actual MAC-PHY pairs. (EX1002, ¶97.)</p> <p>Chincholi’s OMMA layer also includes all of the functionality that the '177 patent associates with the “virtual MAC interface.” Specifically, Figure 6 of Chincholi is a block diagram of an OMMA layer, comprising an IP QoS Scheduler 603, a MAC Resource Reservation module 602, and a Traffic Shaping Module 601. (EX1005, [0139]; EX1002, ¶98.)</p> <p>Petition at 25-26 (identical figure omitted).</p> <p>The IP QoS Scheduler classifies incoming packets of a packet stream, and may segregate them into distinct IP QoS streams (EX1005, [0143]), which a POSITA would have recognized to fulfill the functionality of the “decision block” of the '177 patent’s virtual MAC interface (EX1002, ¶99; <i>see also</i> EX1001, 8:16-21.) The MAC Resource Reservation module determines the time duration or</p>

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	<p>block” of the '177 patent’s virtual MAC interface (EX1001 at 8:16-21). The MAC Resource Reservation module determines the time duration or spectral fragment/bandwidth required by a packet or set of packets (EX1005 at [0142]), which a POSITA would have recognized as fulfilling the functionality of the “processing block” (EX1001 at 8:21-23). Finally, the Traffic Shaping Module determines how packets are routed across RATs using either policy-based routing or feedback-based routing (EX1005 at [0139]), which a POSITA would have recognized as fulfilling the functionality of the “ultra-streaming block” (EX1001 at 8:23-28). Thus, a POSITA would have understood that Chincholi’s OMMA layer includes a “virtual MAC interface.”</p> <p>EX1002 ¶ 99.</p> <p>100. Second, Chincholi discloses that its processing interface comprises the “at least one resource monitoring interface formed in the processing interface,” which, during operation, feeds information regarding the bandwidth availabilities of the first and second wireless transceivers back to the at least one virtual MAC interface. In my opinion, a POSITA would understand that, according to its plain and ordinary meaning, a “resource monitoring interface formed in the processing interface” merely requires a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers.</p> <p>101. Chincholi discloses the capability of receiving feedback statistics regarding the available resources of the wireless transceivers. Specifically, the</p>	<p>spectral fragment/bandwidth required by a packet or set of packets (EX1005, [0142]), which a POSITA would have recognized to fulfill the functionality of the “processing block” of the '177 patent’s virtual MAC interface (EX1002, ¶99; <i>see also</i> EX1001, 8:21-23.) Finally, the Traffic Shaping module determines the way packets are routed across RATs using either policy-based routing or feedback-based routing (EX1005, [0139]), which a POSITA would have recognized to fulfill the functionality of the “ultra-streaming block” of the '177 patent’s virtual MAC interface (EX1002, ¶99; <i>see also</i> EX1001, 8:23-28.) Thus, a POSITA would have recognized that Chincholi’s OMMA layer includes a “virtual MAC interface.” (EX1002, ¶99.)</p> <p>Petition at 26-27.</p> <p>Second, Chincholi discloses that its processing interface comprises the “at least one resource monitoring interface formed in the processing interface” that, during operation, feeds information regarding the bandwidth availabilities of the first and second wireless transceivers back to the at least one virtual MAC interface. A POSITA would understand that according to its plain and ordinary meaning, a “resource monitoring interface formed in the processing interface” requires merely a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers. (EX1002, ¶100.)</p> <p>Chincholi discloses the capability of receiving feedback statistics regarding the available resources of the wireless transceivers. Specifically, the traffic shaping</p>

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	<p>Traffic Shaping Module of the OMMA layer (<i>i.e.</i>, part of the “virtual MAC interface”) may determine packet routing using “feedback based routing” (EX1005 at [0139]). In such routing, “the OMMA transmitter may use measurement metrics fed back from each RAT,” including “channel quality metrics and the number of available resources on the medium,” <i>i.e.</i>, information regarding bandwidth availabilities (EX1005 at [0161]).</p> <p>EX1002 ¶¶ 100-01.</p> <p>102. Figures 28 and 29, along with their associated descriptions, explain how Chincholi collects feedback from each RAT for use by the Traffic Shaping Module. Figure 28 shows that the OMMA layer includes an OMMA Controller, which interfaces with each RAT to gather metrics related to channel quality and the number of available resources on the medium. Specifically, via interface A2 in Figure 28, “[a] RAT (<i>e.g.</i>, each RAT) may provide feedback metrics (<i>e.g.</i>, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 per device (<i>e.g.</i>, WTRU or NT) per access category supported at that RAT” (EX1005 at [0205]).</p> <p>103. The OMMA Controller includes a <i>Feedback Device Classifier module 2930</i> (EX1005 at [0205]). The Feedback Device Classifier collects information regarding the first and second transceiver resources and requirements via the “A2” interfaces shown in the diagram, enabling this information to be fed back to the OMMA Scheduler. Specifically, “[a] RAT (<i>e.g.</i>, each RAT) may provide feedback metrics (<i>e.g.</i>, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 per device (<i>e.g.</i>, WTRU</p>	<p>module of the OMMA (<i>i.e.</i>, part of the “virtual MAC interface”) may determine packet routing using “feedback based routing.” (EX1005, [0139].) In feedback-based routing, “the OMMA transmitter may use measurement metrics fed back from each RAT,” which include “channel quality metrics and the number of available resources on the medium,” <i>i.e.</i> information regarding bandwidth availabilities. (EX1005, [0161]; EX1002, ¶101.)</p> <p>Petition at 27-28.</p> <p>Figures 28, 29, and their associated descriptions describe how Chincholi collects feedback from each RAT for the traffic shaping module. Figure 28 illustrates how the OMMA layer includes an OMMA Controller, which interfaces with each RAT to collect metrics regarding the channel quality and number of resources available on the medium. Specifically, using interface A2 in Figure 28, “[a] RAT (<i>e.g.</i>, each RAT) may provide feedback metrics (<i>e.g.</i>, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 per device (<i>e.g.</i>, WTRU or NT) per access category supported at that RAT.” (EX1005, [0205]; EX1002, ¶102.)</p> <p>Moreover, the OMMA Controller includes a <i>Feedback Device Classifier module 2930</i>. (EX1005, [0205].) The Feedback Device Classifier collects information regarding the first and second transceiver resources/requirements over the “A2” interfaces in the diagram above so that this information may be fed back to the OMMA Scheduler. Specifically, “[a] RAT (<i>e.g.</i>, each RAT) may provide feedback metrics (<i>e.g.</i>, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 per device</p>

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	<p>or NT) per access category supported at that RAT.” (<i>Id.</i>). In my opinion, a POSITA would have recognized that the ability of the <i>Feedback Device Classifier module</i> within the OMMA Controller to collect such feedback on a per-device, per-access-category basis discloses the claimed “<i>resource monitoring interface</i>” of the '177 patent.</p> <p>EX1002 ¶¶ 109-111 (identical figure omitted).</p>	<p>(e.g., WTRU or NT) per access category supported at that RAT.” (<i>Id.</i>) A POSITA would have recognized that the ability of the <i>Feedback Device Classifier module</i> of the OMMA Controller to collect feedback per device, per access category supported by each RAT discloses the “<i>resource monitoring interface</i>” as claimed by the '177 patent. (EX1002, ¶103.)</p> <p>Petition at 29-30 (identical figure omitted).</p>
<p>Grounds for Unpatentability:</p> <p>Claim 1(f)</p>	<p>g) 1[f]: wherein the processing interface is configured to, after the circuitry has been connected to the application interface and when the wireless networking device is being used, and in a manner transparent to any layer of the wireless networking device above the processing interface, (a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces, and (iii) a third association between the recipient and the third actual MAC and PHY interfaces,</p> <p>104. In my opinion, Chincholi/Clegg discloses this limitation.</p> <p>105. “wherein the processing interface is configured to...in a manner transparent to any layer of the wireless networking device above the processing interface”: Chincholi discloses that its OMMA layer (<i>i.e.</i>, the processing interface) is configured to operate transparently with respect to higher layers. For example, Chincholi states that “[t]he OMMA layer may be transparent, in that it distributes and/or combines packets from different RATs and forwards the packets to the IP layer” (EX1005 at [0192], [0126]). This contrasts with a “non-transparent” configuration, in which the OMMA layer would “add[] additional headers at the transmitter, and/or read[] and remove[] the headers at the receiver” (EX1005 at [0126]).</p> <p>EX1002 ¶¶ 104-05.</p>	<p>g) 1[f]: wherein the processing interface is configured to, after the circuitry has been connected to the application interface and when the wireless networking device is being used, and in a manner transparent to any layer of the wireless networking device above the processing interface, (a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces, and (iii) a third association between the recipient and the third actual MAC and PHY interfaces,</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶104-107.)</p> <p>“wherein the processing interface is configured to...in a manner transparent to any layer of the wireless networking device above the processing interface”</p> <p>Chincholi discloses that its OMMA layer (<i>i.e.</i>, processing interface) is configured to operate in a manner transparent to any higher layer. For example, Chincholi discloses that “[t]he OMMA layer may be transparent, in that it distributes and/or combines packets from different RATs and forwards the packets to the IP layer.” (EX1005, [0192], [0126].) This is as opposed to a “non-transparent” configuration in which the OMMA layer would “add[] additional headers at the transmitter, and/or reads and removes the headers at the receiver.” (EX1005, [0126]; EX1002, ¶105.)</p> <p>Petition at 31.</p>

Comparison of Almeroth Decl. (Ex. 1002) vs. Petition
Identical, Minor Changes, Paraphrased

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Patent Owner XiFi’s Exhibit 2006, Page 15

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	<p>106. <i>“(a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces, and (iii) a third association between the recipient and the third actual MAC and PHY interfaces”:</i></p> <p>Chincholi discloses techniques by which network terminals and WTRUs may discover one another using active and passive scanning procedures (EX1005 at [0145]). Following an authentication process, Chincholi further discloses that WTRUs may transmit a request to associate with one or more RATs of the network terminal, and the network terminal may respond with an association response signal either accepting or rejecting the request (EX1005 at [0149]). In my opinion, a POSITA would have recognized that these scanning and association procedures disclose the ability of Chincholi's OMMA layer to request or establish a first, second, and/or third association between a recipient and the respective first, second, and third actual MAC and PHY interfaces.</p> <p>107. When operating transparently with respect to higher layers, Chincholi's OMMA layer manages the request, response, and creation of associations with WTRUs. For example, Chincholi states that “association request/response frames may be updated by the OMMA layer to include OMMA device discovery parameters, for example, such as but not limited to OMMA modes, OMMA schemes, OMMA packet distribution modes, etc.” (EX1005 at [0127]). In my opinion, a POSITA would have recognized that the OMMA layer's role in requesting or creating associations between recipients and the actual MAC and PHY interfaces is performed in a manner that is transparent to higher-level layers.</p> <p>EX1002 ¶¶ 106-07.</p>	<p><i>“(a) request or create (i) a first association between a recipient and the first actual MAC and PHY interfaces, (ii) a second association between the recipient and the second actual MAC and PHY interfaces, and (iii) a third association between the recipient and the third actual MAC and PHY interfaces”</i></p> <p>Chincholi discloses techniques for network terminals and WTRUs to discover one another using active and passive scanning procedures. (EX1005, [0145].) After an authentication procedure, Chincholi discloses that WTRUs may transmit a request to associate with one or more RATs of the network terminal and the network terminal may provide an association response signal accepting or rejecting the request of the WTRU. (EX1005, [0149].) A POSITA would have recognized these scanning procedures disclose the ability of Chincholi's OMMA layer to request or create a first, second, and/or third association between a recipient and the first, second, and/or third actual MAC and PHY interfaces, respectively. (EX1002, ¶106.)</p> <p>When operating transparently with respect to higher layers, Chincholi's OMMA layer handles the request/response and creation of associations with WTRUs. (EX1005, [0127]) (“[A]ssociation request/response frames may be updated by the OMMA layer to include OMMA device discovery parameters, for example, such as but not limited to OMMA modes, OMMA schemes, OMMA packet distribution modes, etc.”.) Thus, a POSITA would have recognized that the request or creation by Chincholi's OMMA layer of associations between recipients and the actual MAC and PHY interfaces would be performed in a manner transparent to higher level layers. (EX1002 at ¶107.)</p> <p>Petition at 32-33.</p>

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<p>Grounds for Unpatentability:</p> <p>Claim 1(g)</p>	<p>h) I[g]: (b) identify at least one first portion of the first actual bandwidth of the first wireless transceiver, the identified at least one first portion comprising a set of given resources,</p> <p>108. In my opinion, Chincholi/Clegg discloses this limitation. Chincholi teaches that NTs and WTRUs communicate with one another over “channels,” which are portions of a transceiver’s bandwidth availability. Specifically, Chincholi states that “[t]he NT and WTRU may communicate with each other over a single radio frequency (RF) spectral band, for example, 2.4 GHz ISM band, or 5 GHz ISM band, or TVWS band, or 60 GHz band, using a channel within the band or aggregating multiple contiguous or noncontiguous channels” (EX1005 at [0118]). Additionally, Chincholi explains that “[a]n 802.11 based system may operate in a time division duplexing (TDD) mode, for example, on a band over a single 20/40 MHz channel in the case of ISM band or a single 5/10/20 MHz channel in television white space (TVWS) band using contiguous/non-contiguous carrier aggregation” (EX1005 at [0121]).</p> <p>109. Chincholi also discloses identifying available bandwidth channels for communication. The OMMA layer receives various forms of feedback information from each RAT (EX1005 at [0123]). For example, “the OMMA transmitter may use</p>	<p>h) I[g]: (b) identify at least one first portion of the first actual bandwidth of the first wireless transceiver, the identified at least one first portion comprising a set of given resources,</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶108-110.) Chincholi teaches that NTs and WTRUs communicate with one another over “channels,” which are portions of a transceiver bandwidth availability. Specifically, “[t]he NT and WTRU may communicate with each other over a single radio frequency (RF) spectral band, for example, 2.4 GHz ISM band, or 5 GHz ISM band, or TVWS band, or 60 GHz band, using a channel within the band or aggregating multiple contiguous or noncontiguous channels.” (EX1005, [0118]; [0121] (“An 802.11 based system may operate in a time division duplexing (TDD) mode, for example, on a band over a single 20/40MHz channel in the case of ISM band or a single 5/10/20 MHz channel in television white space (TVWS) band using contiguous/non-contiguous carrier aggregation”); see also EX1002, ¶108)</p> <p>Chincholi also discloses identifying available bandwidth channels for communication. The OMMA layer receives various feedback information from each RAT. (EX1005, [0123].) For example, “the OMMA transmitter may use measurement metrics fed back from each RAT,” which include “channel quality metrics and the number of available resources on the medium.” (EX1005, [0161].)</p>

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	<p>measurement metrics fed back from each RAT," including "channel quality metrics and the number of available resources on the medium" (EX1005 at [0161]). Among the available resources provided as part of this feedback are the "number of channels" and the "channel bandwidth" (i.e., the width of each channel, such as 20/40 MHz in the case of the ISM band) (EX1005 at [0161]).</p> <p>110. In my opinion, a POSITA would have understood that Chincholi's OMMA layer, by receiving from each RAT information regarding the number of channels and the channel bandwidth, is effectively identifying "at least one first and second portions of the first actual bandwidth"—i.e., available channels or an aggregation of multiple contiguous or non-contiguous channels—within the first actual bandwidth of the first wireless transceiver. A POSITA would have further understood that each identified bandwidth portion is comprised of a number of frequency carriers, which are a set of given resources for the identified channel.</p> <p>EX1002 ¶¶ 108-110.</p>	<p>Amongst the available resources provided as part of the feedback information are the "number of channels" and "channel bandwidth" (i.e., the width of the channel, such as 20/40 MHz in the case of the ISM band.) (EX1005, [0161]; EX1002, ¶109.)</p> <p>A POSITA would have understood that the ability of Chincholi's OMMA layer to receive from each RAT a number of channels and channel bandwidth is an identification of "at least one first and second portions of the first actual bandwidth" (i.e., available channels, or an aggregation of multiple contiguous or non-contiguous channels) of the first actual bandwidth of the first wireless transceiver. (EX1002, ¶110.)</p> <p>A POSITA would have also understood that each identified bandwidth portion is comprised of a number of frequency carriers, which are a set of given resources for the identified channel. (<i>Id.</i>)</p> <p>Petition at 33-34.</p>
<p>Grounds for Unpatentability:</p> <p>Claim 1(h)</p>	<p>d) 1[h]: (c) evaluate whether any of the given resources of the first identified actual bandwidth portion are unavailable for communication,</p> <p>111. In my opinion, Chincholi/Clegg disclose this limitation. A POSITA would have understood that the plain meaning of a resource being "unavailable" in the context of the '177 patent broadly encompasses scenarios in which resources are either partially or completely unavailable, or where a given resource has less bandwidth availability than another. This interpretation is consistent with the</p>	<p>d) 1[h]: (c) evaluate whether any of the given resources of the first identified actual bandwidth portion are unavailable for communication,</p> <p>Chincholi/Clegg disclose this limitation. (EX1002, ¶¶111-116.) A POSITA would have understood that the plain meaning of a resource being "unavailable" in the context of the '177 patent broadly includes resources that are partially or completely unavailable or that have less bandwidth availability than another resource. Indeed, during prosecution of the prior related '591 patent, the applicant expressly stated in arguing patentability to overcome a prior art rejection that "[i]t is</p>

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	<p>prosecution history of the prior related '591 patent, in which the applicant explicitly stated that "[i]t is applicant's intention that these words ['unavailable' and 'unavailability'] refer to, for example, a partial or complete loss of certain transceiver resources as well as a situation where a different band than the one currently in use provides more bandwidth available for transmission" (EX1017, Aug. 8, 2023 Applicant Remarks).</p> <p>EX1002 ¶ 111.</p> <p>112. As I discussed above for limitation 1[e], Chincholi discloses "feedback based routing," wherein the "number of available resources on the medium" for each RAT is monitored and IP packets are distributed across the RATs accordingly (EX1005 at [0161]). For example, the OMMA layer may maintain a "RAT capability database" that stores the available RAT capabilities for an associated WTRU/NT (EX1005 at [0233]) and may "continuously update" this information based on feedback metrics (EX1005 at [0235]). In my opinion, a POSITA would have understood that Chincholi's use of feedback metrics to continuously monitor available resources discloses the capability to evaluate whether any given resources within the first identified bandwidth portion are unavailable for communication.</p> <p>EX1002 ¶ 112.</p> <p>113. Moreover, evaluating the unavailability of given resources within the first identified bandwidth portion is further taught by Clegg. Clegg discloses a technique for a multi-band 802.11 device to "increase data throughput by aggregating one or more of the available sub-channels for simultaneous use in</p>	<p>applicant's intention that these words ["unavailable" and "unavailability"] refer to, for example, a partial or complete loss of certain transceiver resources as well as a situation where a different band than the one currently in use provides more bandwidth available for transmission." (See EX1002 ¶¶ 111; EX1017, Aug. 8, 2023 Applicant Remarks).</p> <p>Petition at 34-35.</p> <p>As discussed above, <i>see</i> limitation 1[e], Chincholi discloses "feedback based routing" wherein the "number of available resources on the medium" of each RAT is monitored and IP packets are distributed across the RATs accordingly. (EX1005, [0161].) The OMMA layer may, for example, maintain a "RAT capability database" storing the available RAT capability for an associated WTRU/NT (EX1005, [0233].) and "continuously updat[ing]" this information based on feedback metrics, (EX1005, [235].) A POSITA would have understood Chincholi's use of feedback metrics to continuously monitor available resources to disclose the capability to evaluate whether any given resources of the first identified bandwidth portion are unavailable for communication. (EX1002, ¶112.)</p> <p>Petition at 35.</p> <p>In addition, evaluating unavailability of given resources within the first identified bandwidth portion is further taught by Clegg. (EX1002, ¶113.) Clegg teaches a technique for a multi-band 802.11 device to "increase data throughput by aggregating one or more of the available sub-channels for simultaneous use in transmitting and receiving data." (EX1009, 1:25-28.) To accomplish this, Clegg</p>

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	<p>transmitting and receiving data" (EX1009 at 1:25–28). To facilitate this, Clegg teaches the use of an "ultra-wideband tuner to evaluate the entire available spectrum between several communication bands" (EX1009 at 3:60–63). Specifically, an 802.11 access point may "search across 1) available bands (e.g., the 2.4 GHz, 5 GHz, and/or 60 GHz bands), and 2) sub-channels within each band, and measure interference on a carrier-by-carrier basis across those bands and sub-channels" (EX1009 at 4:5–9). Each carrier is then evaluated to determine whether interference is "too high or above a threshold amount" (EX1009 at 7:16–17). Based on this evaluation, Clegg generates a "channel map" identifying available carriers across entire bands or discrete sub-channels "so that a user can select subcarriers from across those bands to form a cluster for communication" (EX1009 at 7:19–22).</p> <p>EX1002 ¶ 113.</p> <p>114. In my opinion, a POSITA would have understood Clegg's carrier-by-carrier evaluation of interference to disclose an evaluation of whether any of the given resources of the first identified bandwidth portion are unavailable for communication.</p> <p>115. Furthermore, as I discussed above in Section V.A, a POSITA would have been motivated to combine Clegg's teachings about how to mitigate carrier-specific interference into system of Chincholi. The resulting combination would implement Chincholi's ability to dynamically allocate contiguous or non-contiguous bandwidth channels along with Clegg's ability to mitigate interference within</p>	<p>teaches the use of an "ultra-wideband tuner to <i>evaluate</i> the entire available spectrum between several communication bands." (EX1009, 3:60-63.) Specifically, an 802.11 access point may "search across 1) available bands (e.g., the 2.4 GHz, 5 GHz, and/or 60 GHz bands), and 2) sub-channels within each band, and measure interference on a carrier-by-carrier basis across those bands and sub-channels." (EX1009, 4:5-9.) Each carrier is evaluated to determine whether interference is "too high or above a threshold amount." (EX1009, 7:16-17.) Clegg can use this information to create a "channel map" identifying the available carriers across entire communication bands or discrete sub-channels "so that a user can select subcarriers from across those bands to form a cluster for communication." (EX1009, 7:19-22.)</p> <p>Petition at 35-36.</p> <p>A POSITA would have understood Clegg's carrier-by-carrier evaluation of interference to disclose an evaluation of whether any of the given resources of the first identified bandwidth portion are unavailable for communication. (EX1002, ¶114.)</p> <p>For the reasons discussed above, <i>see</i> Section VII.A, a POSITA would have been motivated to combine Clegg's teachings about how to mitigate carrier-specific interference into system of Chincholi. The resulting combination would implement Chincholi's ability to dynamically allocate contiguous or non-contiguous bandwidth channels along with Clegg's ability to mitigate interference within channels on a carrier-by-carrier basis, thus increasing the bandwidth efficiency of the combined</p>

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	<p>channels on a carrier-by-carrier basis, thus increasing the bandwidth efficiency of the combined system.</p> <p>116. Thus, Chincholi/Clegg discloses evaluating the given resources of the first identified actual bandwidth portion to determine whether the portion is unavailable for communication.</p> <p>EX1002 ¶¶ 114-16.</p>	<p>system. (EX1002, ¶115.)</p> <p>Thus, Chincholi/Clegg discloses evaluating the given resources of the first identified actual bandwidth portion to determine whether the portion is unavailable for communication. (EX1002, ¶116.)</p> <p>Petition at 36-37.</p>
<p>Grounds for Unpatentability:</p> <p>Claim 1(i)</p>	<p>j) 1[i]: (d) use the first wireless transceiver to transmit the first data stream to the recipient, without requiring disassociation of the recipient from any of the first, second and third actual MAC and PHY interfaces, using a subset of frequencies corresponding to only the given resources of the first bandwidth portion that are not unavailable for communication to thereby at least partially satisfy the first wireless bandwidth requirement of the first application;</p> <p>117. In my opinion, Chincholi/Clegg discloses this limitation. Clegg teaches that an 802.11 network terminal can use a first wireless transceiver to transmit a data stream using only the subset of frequencies that are not unavailable for communication—without requiring disassociation of the recipient from the access point.</p> <p>118. Specifically, after evaluating the interference levels of each carrier across the available spectrum, Clegg teaches the capability to “notch out” specific OFDM subcarriers that experience an unduly high level of interference (EX1009 at 7:15–19). The remaining carriers—those suitable for communication—are then</p>	<p>j) 1[i]: (d) use the first wireless transceiver to transmit the first data stream to the recipient, without requiring disassociation of the recipient from any of the first, second and third actual MAC and PHY interfaces, using a subset of frequencies corresponding to only the given resources of the first bandwidth portion that are not unavailable for communication to thereby at least partially satisfy the first wireless bandwidth requirement of the first application;</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶117-121.) Clegg teaches the ability of an 802.11 network terminal to use a first wireless transceiver, without requiring disassociation of the recipient from the access point, to transmit a data stream using only the subset of frequencies that are not unavailable for communication. (EX1002 ¶117.)</p> <p>Specifically, after evaluating the interference levels of each carrier across the available spectrum, Clegg teaches a capability for “notching out” specific OFDM subcarriers that suffer an unduly high amount of interference. (EX1009, 7:15-19.) The remaining carriers, which are suitable for communication, are selected to comprise a “cluster of carriers for communication.” (EX1009, 4:9-10.) The cluster</p>

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	<p>selected to form a “cluster of carriers for communication” (EX1009 at 4:9–10). This cluster may include: “1) contiguous carriers in a single sub-channel, 2) contiguous carriers spanning across more than one sub-channel, 3) discontinuous carriers in a single sub-channel, or 4) discontinuous carriers spanning across more than one sub-channel” (EX1009 at 4:11–15). In my opinion, a POSITA would have recognized that Clegg’s selection of a cluster of carriers enables the transmission of the first data stream using only the subset of frequencies—or given resources—within the first identified bandwidth portion that are not unavailable.</p> <p>EX1002 ¶¶ 117-18.</p> <p>119. Thus, in my opinion, the Chincholi/Clegg combination would not “require” disassociation of a recipient from any of the MAC and PHY interfaces during the bandwidth management operations described above.</p> <p>120. It is further my opinion that a POSITA would have recognized the desirability of implementing Chincholi in combination with the teachings of Clegg to enable transmission of the first data stream to the recipient without requiring disassociation from either or both first and second actual MAC and PHY interfaces. For example, in the context of 802.11 systems—where each associated terminal is assigned a unique association identifier (“AID”)—it was well known that avoiding disassociation after initial association was desirable, as repeatedly re-establishing associations was inefficient and disruptive. (EX1008 (U.S. Patent No. 9,379,868) (“Wang”) at 24:42–43 (“This approach is undesirable, can be blunt and can disrupt</p>	<p>of carriers may comprise: “1) contiguous carriers in a single sub-channel, 2) contiguous carriers spanning across more than one sub-channel, 3) discontinuous carriers in a single sub-channel, or 4) discontinuous carriers spanning across more than one sub-channel.” (EX1009, 4:11-15.) A POSITA would have recognized that Clegg’s selection of a cluster of carriers enables transmission of the first data stream using only the subset of frequencies/given resources of the first identified bandwidth portion that are not unavailable. (EX1002, ¶118.)</p> <p>Petition at 37-38.</p> <p>The Chincholi/Clegg combination would not “require” disassociation of a recipient from any of the MAC and PHY interfaces during the bandwidth management operations described above. (EX1002, ¶119.)</p> <p>Indeed, a POSITA would have recognized the desirability of implementing Chincholi combined with the teachings of Clegg to transmit the first data stream to the recipient without requiring “disassociation” of the recipient from either or both of the first and second actual MAC and PHY interfaces. For example, in the field of 802.11 systems—where each associated terminal is assigned a unique association identifier (“AID”)—it was well-known that avoiding disassociation after initial association was desirable, as repeatedly re-forming associations was inefficient and disruptive. (EX1002, ¶120; see also EX1008 (U.S. Patent 9,379,868) (“Wang”) at 24:42-43 (“This approach is undesirable, can be blunt and can disrupt the on-going services (e.g., requires disassociation), at 24:57-62 (“The lack of update/change of</p>

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	<p>the on-going services (e.g., requires disassociation)"); <i>id.</i> at 24:57–62 ("The lack of update/change of the AID values . . . after an initial AID assignment is inherently inflexible and can prevent the realization [of] power saving, among other considerations, that an update/change of the AID values can provide.")). Recognizing this issue, Wang described techniques in a multiple transceiver/MIMO system for updating a recipient's AID through system-level interactions—without requiring disassociation of the wireless device from the access point. (<i>Id.</i> at 24:63–25:57).</p> <p>121. Considering this background art, in my opinion, a POSITA would have recognized that, in implementing the Chincholi/Clegg combination, it would be desirable to incorporate known dynamic AID reassignment techniques in order to avoid disassociation of recipients during operation—including throughout any process of reallocating transceiver, channel, and/or bandwidth resources to a recipient.</p> <p>EX1002 ¶¶ 119-121.</p>	<p>the AID values . . . after an initial AID assignment is inherently inflexible and can prevent the realization power saving, among other considerations, that an update/change of the AID values can provide.") Recognizing this issue, background prior art reference Wang described techniques in a multiple transceiver/MIMO system for effectuating an update to a recipient's unique association identifier ("AID") through various interactions with the system without requiring a disassociation of a wireless device from an access point. (<i>Id.</i>, 24:63-25:57.)</p> <p>In light of this background art, a POSITA would have recognized that in implementing the Chincholi/Clegg combination, it would be desirable implement known dynamic AID reassignment techniques to avoid disassociation of recipients during operation including throughout any process of reallocating transceiver, channel, and/or bandwidth resources to a recipient. (EX1002, ¶121.)</p> <p>Petition at 38-39.</p>
<p>Grounds for Unpatentability: Claim 1(j)</p>	<p>k) 1[j]: (e) identify at least one first portion of the second actual bandwidth of the second wireless transceiver, the identified at least one first portion of the second actual bandwidth of the second wireless transceiver comprising a set of given resources,</p> <p>122. Limitation 1[j] is identical to limitation 1[g] except it relates to the second wireless transceiver instead of the first. As such, it is my opinion that a POSITA would have recognized from the analysis in limitation 1[g] that the Chincholi/Clegg combination discloses this limitation.</p> <p>EX1002 ¶ 122.</p>	<p>k) 1[j]: (e) identify at least one first portion of the second actual bandwidth of the second wireless transceiver, the identified at least one first portion of the second actual bandwidth of the second wireless transceiver comprising a set of given resources,</p> <p>Limitation 1[j] is identical to limitation 1[g] except it relates to the second wireless transceiver instead of the first. A POSITA would have recognized from the analysis in limitation 1[g] that the Chincholi/Clegg combination discloses this limitation. (EX1002, ¶122.)</p> <p>Petition at 39.</p>

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<p>Grounds for Unpatentability:</p> <p>Claim 1(k)</p>	<p>l) 1[k]: (f) evaluate whether any of the given resources of the first identified actual bandwidth portion of the second wireless transceiver are unavailable for communication, and</p> <p>123. Limitation 1[k] is identical to limitation 1[h] except it relates to the second wireless transceiver instead of the first. As such, it is my opinion that a POSITA would have recognized from the analysis in limitation 1[h] that the Chincholi/Clegg combination discloses this limitation.</p> <p>EX1002 ¶ 123.</p>	<p>l) 1[k]: (f) evaluate whether any of the given resources of the first identified actual bandwidth portion of the second wireless transceiver are unavailable for communication, and</p> <p>Limitation 1[k] is identical to limitation 1[h] except it relates to the second wireless transceiver instead of the first. A POSITA would have recognized from the analysis in limitation 1[h] that the Chincholi/Clegg combination discloses this limitation. (EX1002, ¶123.)</p> <p>Petition at 40.</p>
<p>Grounds for Unpatentability:</p> <p>Claim 1(l)</p>	<p>m) 1[l]: (g) use the second wireless transceiver to receive a second data stream from the recipient, without requiring disassociation of the recipient from any of the first, second and third actual MAC and PHY interfaces, using a subset of frequencies corresponding to only the given resources of the first bandwidth portion of the second wireless transceiver that are not unavailable for communication to thereby at least partially satisfy a wireless bandwidth requirement associated with the second data stream; and</p> <p>124. In my opinion, Chincholi/Clegg discloses this limitation. Limitation 1[l] is identical to limitation 1[i] except it relates to the second wireless transceiver instead of the first and relates to data reception as opposed to data transmission. As such, as I discussed above in limitation 1[i], Chincholi/Clegg disclose using only those transceiver resources that are not unavailable to satisfy an application bandwidth requirement.</p> <p>EX1002 ¶ 124.</p>	<p>m) 1[l]: (g) use the second wireless transceiver to receive a second data stream from the recipient, without requiring disassociation of the recipient from any of the first, second and third actual MAC and PHY interfaces, using a subset of frequencies corresponding to only the given resources of the first bandwidth portion of the second wireless transceiver that are not unavailable for communication to thereby at least partially satisfy a wireless bandwidth requirement associated with the second data stream; and</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶124-129.) Limitation 1[l] is identical to limitation 1[i] except it relates to the second wireless transceiver instead of the first and relates to data reception as opposed to data transmission. As discussed in limitation 1[i], Chincholi/Clegg disclose using only those transceiver resources that are not unavailable to satisfy an application bandwidth requirement. (EX1002, ¶124.)</p> <p>Petition at 40-41.</p>

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	<p>125. Moreover, the techniques disclosed in Chincholi and Clegg are equally applicable to the reception of a data stream. In addition to managing the transmission of an IP flow from its transceivers, Chincholi describes how the OMMA layer enables the management of transceiver resources for receiving an IP flow. For example, Figure 5 illustrates a bidirectional data flow between the actual MAC layer and the OMMA layer via links "A1" and "A2," indicating that the OMMA layer facilitates both uplink and downlink communication. (EX1005, at FIG.5):</p> <p>EX1002 ¶ 125 (identical figure omitted).</p>	<p>Moreover, the techniques of Chincholi/Clegg are equally applicable to reception of a data stream. In addition to managing the transmission of an IP flow from its transceivers, Chincholi discloses how its OMMA layer enables management of the transceiver resources to receive an IP flow. (EX1002, ¶125.) Figure 5, for example, depicts a two-way data flow between the actual MAC layer and the OMMA layer on links "A1" and "A2" (EX1005, FIG. 5):</p> <p>Petition at 40-41 (identical figure omitted).</p>
	<p>126. Further, Table 1 of Chincholi describes the "A1" and "A2" links in Figure 5 as supporting both "Incoming" and "Outgoing" MAC service data units (MSDUs). (EX1005 at [0138]). Chincholi explains that the OMMA layer aggregates bandwidth across multiple RATs in a manner transparent to higher layers, allowing it to either "distribute[]" or "combine[]" packets from different RATs. (<i>Id.</i>) In my opinion, a POSITA would have understood that the OMMA layer's ability to "combine" packets refers to the aggregation of simultaneously received packets across multiple RATs from a single IP flow before forwarding them to the IP layer.</p> <p>127. In my opinion, a POSITA would have also recognized that Chincholi's system may be implemented to simultaneously transmit the first data stream using the first transceiver while receiving the second data stream using the second transceiver. Because Chincholi's architecture supports the use of multiple antenna/RF front-end pairs, each operating on a distinct frequency band. (EX1005 at [0136]), in my opinion, a POSITA would have understood that the system can be configured to support simultaneous transmission and reception across separate transceivers.</p> <p>EX1002 ¶¶ 126-27.</p>	<p>Further, Table 1 of Chincholi describes the "A1" and "A2" links of Figure 5 as involving both the "Incoming" and "Outgoing" MAC MSDUs (MAC service data units). (EX1005, [0138].) Indeed, Chincholi describes that the OMMA layer aggregates bandwidth across multiple RATs, in a manner transparent to higher levels, to either "distribute[]" or "combine[]" packets from different RATs. (<i>Id.</i>) A POSITA would have understood the ability of the OMMA layer to "combine" packets relates to combining simultaneously received packets across multiple RATs from a single IP flow prior to transmission up to the IP layer. (EX1002, ¶126.)</p> <p>A POSITA would have also recognized that the ability to implement Chincholi's system to simultaneously transmit the first data stream using the first transceiver and receive the second data stream using the second transceiver. Because Chincholi's system is capable of implementing multiple antenna/RF pairs, each operating on a different specific frequency band (EX1005, [0136]), a POSITA would have recognized the ability to implement Chincholi as a simultaneous transmit and receive system. (EX1002, ¶127).</p> <p>Petition at 41-42.</p>

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	<p>128. Operating a multi-transceiver system such as Chincholi's to simultaneously transmit from one transceiver and receive from another was well known and, in my opinion, obvious to a POSITA at the time of the '177 patent. This is illustrated, for example, in background reference U.S. Patent No. 10,567,147 ("DiFazio") (EX1010). DiFazio explains that a "full duplex" system is one that transmits and receives a radio frequency (RF) signal simultaneously. (EX1010 at 1:24-26). This is most commonly implemented using "frequency division duplexing (FDD), where the Tx and Rx bands may be sufficiently separated in frequency such that filters can adequately attenuate any energy from the Tx signal that would leak into the Rx signal path and otherwise corrupt the Rx signal and prevent proper operation" (EX1010 at 1:26-31; <i>see also id.</i> at 16:51-67, 17:48-18:23). Additionally, DiFazio discloses a "full duplex single channel" (FDSC) capability, wherein a base station may simultaneously transmit and receive data streams within a single frequency channel. (EX1010 at 13:31-56).</p> <p>EX1002 ¶ 128.</p> <p>129. In my opinion, a POSITA would have been motivated to implement simultaneous transmit-and-receive functionality into the system taught by Chincholi in order to improve network efficiency and throughput. As DiFazio explains, the use of full duplex single channel (FDSC) capability can yield up to a 70% increase in throughput compared to conventional half-duplex systems. (EX1010 at 16:29-30). To the extent such functionality is not explicitly disclosed by Chincholi, in my opinion, implementing simultaneous transmit-and-receive capability within Chincholi's architecture would have been technologically feasible and could have been accomplished in a straightforward manner with a reasonable expectation of success.</p>	<p>Operating a multi-transceiver system like Chincholi to simultaneously transmit from one transceiver and receive from another was well-known and obvious to a POSITA at the time of the patent. (EX1002, ¶128.) This is explained, for example, in background reference U.S. Patent 10,567,147 ("DiFazio") (EX1010). DiFazio teaches that a "full duplex" system is one that transmits and receives the radio frequency RF signal simultaneously. (EX1010, 1:24-26.) This is most often accomplished by implementing "frequency division duplexing (FDD) where the Tx and RX bands may be sufficiently separated in frequency such that filters can adequately attenuate any energy from the Tx signal that would leak into the Rx signal path and otherwise corrupt the Rx signal and prevent proper operation." (EX1010, 1:26-31; <i>see also id.</i>, 16:51-67, 17:48-18:23.) Additionally, DiFazio teaches a "full duplex single channel" (FDSC) capability, wherein a base station may even simultaneously transmit and receive data streams in a single frequency channel. (EX1010 13:31-56.)</p> <p>Petition at 42-43.</p> <p>A POSITA would have been motivated to implement a simultaneous transmit and receive functionality into the system taught by Chincholi to achieve greater network efficiency and throughput. (EX1002, ¶129.) As DiFazio teaches, for example, the ability to simultaneously transmit and receive using FDSC can achieve 70% greater throughput as compared to conventional half-duplex systems. (EX1010 16:29-30.) To the extent not explicitly disclosed by Chincholi, implementing a simultaneous transmit and receive functionality into its disclosed system would have been technologically feasible and could be accomplished in straightforward manner with a reasonable expectation of success. (EX1002, ¶129.)</p> <p>Petition at 43.</p>

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	EX1002 ¶ 129.	
Grounds for Unpatentability: Claim 1(m)	<p>n) 1[m]: wherein, after the circuitry has been connected to the application interface and when the wireless networking is being used, the wireless networking device's utilization of the first available bandwidth portion of the first wireless transceiver does not prevent any wireless networking device from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the first wireless transceiver for data transmission or reception purposes at the same time that the first bandwidth portion is being used for data transmission purposes; and</p> <p>130. In my opinion, Chincholi/Clegg discloses this limitation. Chincholi discloses examples of "multi-WTRU multi-IP flow cases." (EX1005 at [0328]). For instance, Chincholi states that "[a] system may comprise multiple WTRUs, a single NT, and multiple IP flows from the NT to one or more WTRUs." (<i>Id.</i>). This configuration is illustrated, for example, in Figure 3.</p> <p>EX1002 ¶ 130 (identical figure omitted).</p>	<p>n) 1[m]: wherein, after the circuitry has been connected to the application interface and when the wireless networking is being used, the wireless networking device's utilization of the first available bandwidth portion of the first wireless transceiver does not prevent any wireless networking device from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the first wireless transceiver for data transmission or reception purposes at the same time that the first bandwidth portion is being used for data transmission purposes; and</p> <p>Chincholi/Clegg discloses this limitation. (EX1002, ¶¶130-133.) Chincholi discloses examples of "<i>multi-WTRU</i> multi-IP flow cases." (EX1005, [0328].) For example, "[a] system may comprise <i>multiple WTRUs</i>, a single NT, and multiple IP flows from the NT to one or more WTRUs." (EX1005, [0328].) This is disclosed, for example in Figure 3. (EX1002, ¶130.)</p> <p>Petition at 43-44 (identical figure omitted).</p>
	<p>131. To manage data flows for multiple WTRUs, Chincholi teaches techniques for queuing packets based on their access categories and/or WTRU addresses, and for optimizing the distribution of packets from multiple streams across multiple RATs. (EX1005 at [0351]–[0356]). For example, Chincholi discloses that the MAC layer of a given transceiver may implement multiple transmission buffers, denoted Q_{ik}, where "i" identifies the WTRU for which a group of packets is intended, and "k" refers to the IP flow associated with that group of packets. (EX1005 at [0352]).</p> <p>EX1002 ¶ 131.</p>	<p>To manage data flows for multiple WTRUs, Chincholi teaches techniques for queuing packets according to their access categories and/or WTRU addresses and optimizing the distribution of packets of multiple streams for multiple WTRUs across multiple RATs. (EX1005, [0351]–[0356].) For example, Chincholi discloses a MAC layer of a given transceiver may implement multiple transmission buffers, denoted Q_k, where "i" refers to the WTRU for which a group of packets is designated and "k" refers to the IP flow associated with the group of packets. (EX1005, [352]; EX1002, ¶131.)</p> <p>Petition at 44.</p>

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	<p>132. Chincholi further discloses that utilization of available transceiver bandwidth by one WTRU does not preclude other WTRUs from simultaneously using remaining portions of that bandwidth. As discussed above, Chincholi's OMMA layer receives feedback metrics from each RAT. (EX1005 at [0161]). Among these metrics is the "MAC Type," which may indicate, for example, "OFDMA" (<i>id.</i>, Table 2). OFDMA—Orthogonal Frequency Division Multiple Access—is a well-known wireless communication technique in which available bandwidth is divided into smaller subcarriers (<i>i.e.</i>, frequency ranges), which are then allocated to different users. These subcarriers are orthogonal in the sense that they do not interfere with one another when transmitted simultaneously. In my opinion, a POSITA would have recognized that the use of OFDMA techniques enables multiple WTRUs to access different portions of the transceiver bandwidth concurrently and without mutual interference.</p> <p>EX1002 ¶ 132.</p> <p>133. Because Chincholi's RATs may provide feedback to the OMMA indicating that they are operating as an OFDMA MAC Type, in my opinion, a POSITA would have recognized that Chincholi discloses the capability for multiple WTRUs to simultaneously utilize different portions of a transceiver's available bandwidth.</p> <p>EX1002 ¶ 133.</p>	<p>Chincholi further discloses how utilization of the available transceiver bandwidth for one WTRU does not prevent other WTRUs from utilizing a range of frequencies corresponding to the remaining transceiver bandwidth at the same time. As discussed above, Chincholi's OMMA layer receives feedback metrics from each RAT. (EX1005, [0161].) Amongst the feedback metrics are the "MAC Type," for example "OFDMA." (<i>Id.</i>, [0161], Table 2.) OFDMA stands for "Orthogonal Frequency Division Multiple Access," which was a known wireless communication technique for dividing an available bandwidth into smaller subcarriers (<i>i.e.</i> frequency ranges) which are then allocated to different users. (EX1002, ¶132.) These subcarriers are described as orthogonal because they do not interfere with each other when simultaneously transmitted. A POSITA would have recognized that OFDMA techniques would allow multiple WTRUs to access different channels of the transceiver resources simultaneously and without interference. (<i>Id.</i>)</p> <p>Petition at 45-46.</p> <p>Because Chincholi's RATs may provide feedback to the OMMA indicating that they are operating as an OFDMA MAC Type, a POSITA would have recognized that Chincholi discloses the capability to allow multiple WTRUs to simultaneously utilize different portions of a transceiver's available bandwidth. (EX1002, ¶133.)</p> <p>Petition at 46.</p>

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<p>Grounds for Unpatentability:</p> <p>Claim 1(n)</p>	<p>o) 1[n]: wherein, after the circuitry has been connected to the application interface and when the wireless networking is being used, the wireless networking device's utilization of the first available bandwidth portion of the second wireless transceiver does not prevent any wireless networking device from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the second wireless transceiver for data transmission or reception purposes at the same time that the first bandwidth portion is being used for data reception purposes.</p> <p>134. Limitation 1[n] is identical to limitation 1[m] except it relates to the second wireless transceiver instead of the first. As such, it is my opinion that a POSITA would have recognized from the analysis in limitation 1[m] that the Chincholi/Clegg combination discloses this limitation.</p> <p>EX1002 ¶ 134.</p>	<p>o) 1[n]: wherein, after the circuitry has been connected to the application interface and when the wireless networking is being used, the wireless networking device's utilization of the first available bandwidth portion of the second wireless transceiver does not prevent any wireless networking device from utilizing a range of frequencies corresponding to the remaining portion of the bandwidth availability of the second wireless transceiver for data transmission or reception purposes at the same time that the first bandwidth portion is being used for data reception purposes.</p> <p>Limitation 1[n] is identical to limitation 1[m] except it relates to the second wireless transceiver instead of the first. A POSITA would have recognized from the analysis in limitation 1[m] that the Chincholi/Clegg combination discloses this limitation. (EX1002, ¶134.)</p> <p>Petition at 46.</p>