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Central Reexamination Unit
Commissioner of Patents
United States Patent & Trademark Office
P.O. Box 1450
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RESPONSE TO OFFICE ACTION

Dear Sir:

This Response is in reply to the Office Action dated March 31, 2025 and is being timely filed in conformance with 37 C.F.R. § 1.550. Please consider the following:

Notification of Concurrent Proceedings beginning on page 2 of this paper;

Remarks beginning on page 3 of this paper; and

Listing of Claims beginning on page 54 of this paper; and

**37 CFR §1.8
CERTIFICATE OF TRANSMISSION**

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/Jennifer Picini/
Jennifer Picini

June 2, 2025
Date

NOTIFICATION OF CONCURRENT PROCEEDINGS

Pursuant to 37 C.F.R. § 1.565(a), Patent Owner identifies the following concurrent proceedings involving U.S. Patent No. RE47720:

- *USTA Technology, LLC v. AsusTek Computer Inc.*, No. 4-24-cv-00512 (EDTX)
- *USTA Technology, LLC v. AT&T Inc. et al.*, No. 4-24-cv-00513 (EDTX)
- *USTA Technology, LLC v. Lenovo Group Limited*, No. 4-24-cv-00515 (EDTX)
- *Intel Corp. et al. v. USTA Technology, LLC*, IPR2025-00838 (PTAB)

REMARKS

Claims 53-56, 64-66, 70, 76, 81-84 and 87-94 of U.S. Patent No. RE47,720 (“the ‘720 patent”) are subject to reexamination and stand rejected. Original claims 1-52, 57-63, 67-69, 71-75, 77-80, 85-86 and 95-96 of the ‘720 patent are not subject to reexamination. No claims have been cancelled. Accordingly, claims 53-56, 64-66, 70, 76, 81-84 and 87-94 are pending. USTA Technology, LLC (“USTA” or “Patent Owner”) respectfully requests reconsideration of the rejections and a finding that the pending claims are patentable in view of these remarks.¹

High-Level Description of the ‘720 Patent

The ‘720 patent resulted from the pioneering efforts of Jerry D. Burchfiel (hereinafter “the Inventor”) in the area of spectrum management in wireless networking systems. Dr. Burchfiel has been at the forefront of technological advances in networking going back to at least the 1960s through his work at Lincoln Labs at MIT and then at BBN.² The ‘720 patent represents another example of his innovations in the area of networking, and in particular, wireless networking.³

His efforts resulted in the development of a method and apparatus for increasing the available spectrum in a wireless network by sharing existing allocated (and in-use) portions of the RF spectrum in a manner that will minimize the probability of interfering with existing legacy users in 2002. At the time of these pioneering efforts, there was increasing demand for spectrum-

¹ Nothing contained herein should be construed as adopting or advancing a particular claim construction unless expressly noted otherwise and Patent Owner reserves the right to propose or challenge any constructions under the *Phillips* standard applicable in any other proceeding. Additionally, Patent Owner is not admitting or conceding the cited references disclose or would have rendered obvious any claims or claim limitations that are not specifically addressed herein and reserves all rights to present additional or different arguments in support of patentability and/or validity.

² See *generally* Ex. 2002 (Burchfiel Oral History). BBN has been part of GTE, Verizon and Raytheon over the years.

³ *Id.*

based services and devices to address decreasing wireless communications network bandwidth. Moreover, managing interference levels was made particularly difficult by the greater density, mobility and variability of “next generation” (XG) radio frequency emitters. (*See* ’720 patent at 1:19-34.)

While the then-existing solutions for spectrum management to address increasing demand for spectrum-based services and devices sought to assign locally unoccupied portions of the RF spectrum to XG users, the FCC Spectrum Management Policy Task Force recommended that secondary users of a band are required to accept interference from primary users, and must cause no “harmful” interference to the primary users. The Task Force policy permitted secondary (e.g., unlicensed) users to radiate only enough power in an area of interest to raise the interference temperature in the band to a specified threshold T_0 for the band, service, and locality, and would create an opportunity to “underlay” existing primary applications with low-power, low-impact opportunistic applications that operate below the threshold. (*See* ’720 patent at 1:35-53.)

However, the Spectrum Policy Task Force Report did not address how to build and configure networks and devices that comply with the proposed rules. Accordingly, the Inventor conceived of the inventions in the ’720 patent as a way to describe tools, devices and applications users can build, configure and deploy in order to take advantage of the proposed spectrum policies. (*See* ’720 patent at 1:54-62.)

For example, the Inventor conceived of a node of a network communications system that could be configured to:

- (a) Continuously carry out real-time sensing and characterization of the local spectrum usage by (potentially interfering) narrowband and-wideband emitters;

- (b) Dynamically and autonomously adapt (on a time scale of milliseconds) to the local spectrum environment by selecting and controlling the waveforms (power spectral density (PSD) and Media Access Control (MAC) protocols) that its network neighbors use when transmitting to this node;
- (c) Automatically carry out a closed loop power control algorithm with each neighbor to throttle back on unnecessarily high power levels, thereby enhancing Low Probability of Detection (LPD);
- (d) Apply transmission security ("TRANSEC") parameters to the spread spectrum modulation process in order to enhance Low Probability of Intercept (LPI); and/or
- (e) Carry out packet forwarding (routing) in a way that balances aggregate network throughput against average end-to-end delay. (This results in real time traffic, e.g., voice, being sent with higher power, minimizing latency due to channel access delays at multiple hops, and bulk traffic being sent with lower power, minimizing network self-interference, maximizing spatial reuse of frequencies and enhancing LPI/LPD).

(See '720 patent at 2:12-38.)

The inventions of the '720 patent also provide a way to underlay new services on then-existing bandwidth allocations with minimal or no interference to, and from, existing legacy users, by underlaying spectrum-efficient megabit rate networking onto bands allocated for other purposes, while providing up to 30 times greater throughput than then-current spectrum management systems. (See '720 patent at 2:7-11.) For example, military networking could underlay any narrowband-channelized spectrum where individual channels have less than 100% duty cycle, such as in commercial cellular, without interfering with existing legacy users of these bands. At the same time, the flexible hardware and software made possible by the inventions of

the '720 patent will also operate in other frequencies without hardware modification when necessary, such as in overseas locations and in wartime. (*See id.* at 2:49-64.)

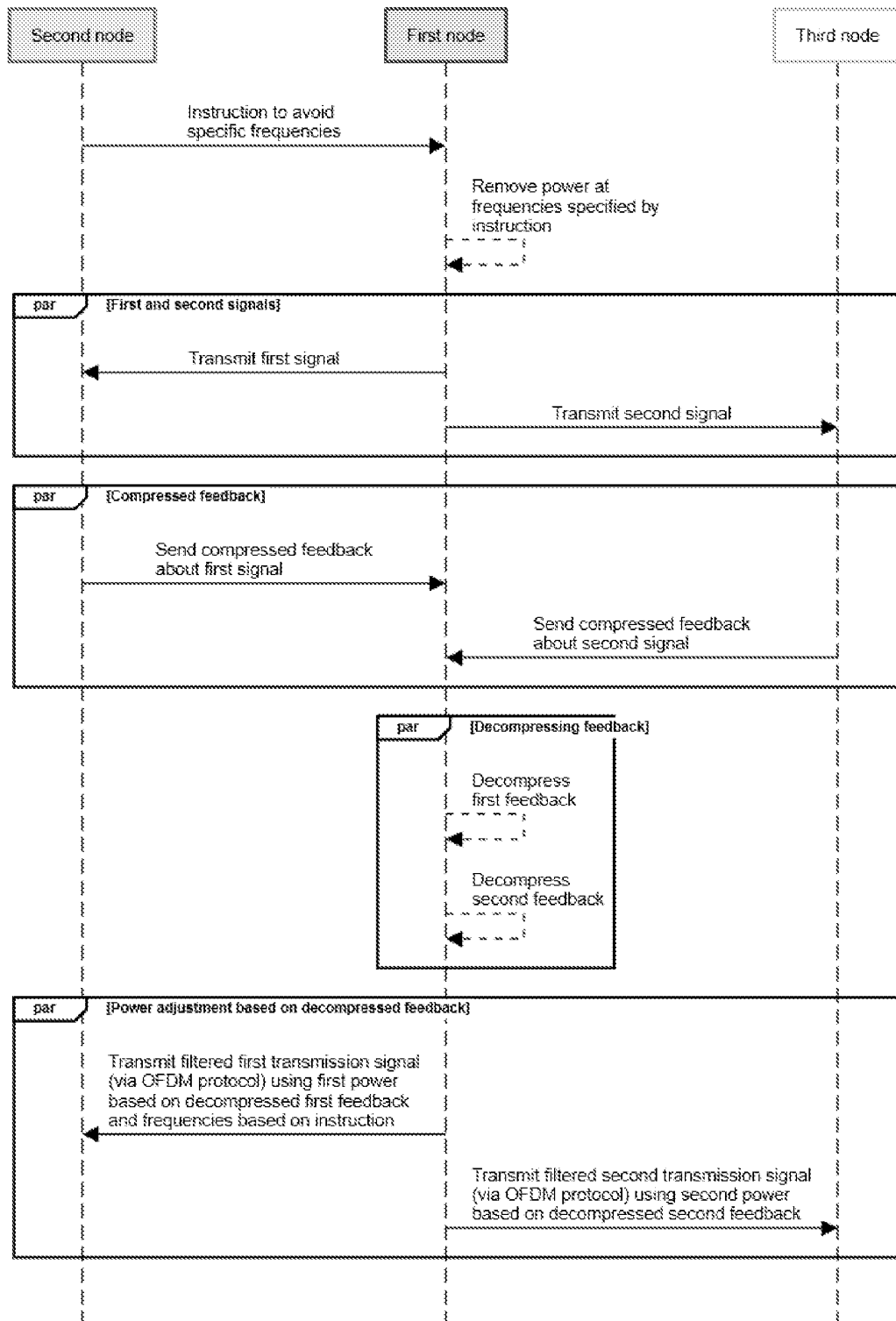
The inventions of the '720 patent address individual spectrum management devices and provide an integrated system concept for dynamic, adaptive, radio frequency spectrum assignment and use. The result is far greater spectrum efficiency, providing megabit/sec rate communications networks that can extend far beyond the capabilities of then-existing wireless networking systems and devices. (*See* '720 patent at 1:66-2:7.)

Moreover, the design of the highly advanced networking communications architecture described and claimed by the '720 patent combines dynamic spectrum management techniques with matching adaptive networking and full exploitation of multiple transceivers per communications node. The inventions of the '720 patent thus provide increased flexibility and scalability, and may be easily adapted for use with other forward-looking wireless communications systems and technologies. (*See* '720 patent at 2:39-48.) The inventions of the '720 patent overcome problems specifically arising out of how to design and develop tools, devices and applications that take advantage of the spectrum management policies proposed by the FCC Spectrum Management Policy Task Force. (*See* '720 patent at 1:54-62.)

The sequence diagram below is a visual depiction of the method recited in claim 53:⁴

⁴ Patent Owner's paraphrasing of claim 53 in this diagram is for convenience only. For the avoidance of doubt, the language of claim 53 controls.

Claim 53



In relevant part, and as illustrated above, claim 53 requires that the first node (shown in blue above) receives an instruction from a second node, receives compressed feedback from the second and third nodes that characterizes receipt of first and second signals sent by the first node to the second and third nodes respectively, decompresses the compressed feedback from the second and third nodes, and simultaneously transmits filtered transmission signals to the second and third nodes using a first and second power respectively.

Overview of the Asserted References

Agee (U.S. Pat. App. Pub. No. US 2004/0095907) (Ex. 1008)

According to Agee's Abstract, Agee is directed to a "locally enabled global optimization of a multipoint, wireless electromagnetic communications network of communication nodes," where "each diversity-channel-capable node uses computationally efficient exploitation of pilot tone data and diversity-adaptive signal processing of the weightings and the signal to further convey optimization and channel information which promote local and thereby network-global efficiency." (Ex. 1008 at Abstract.)

McFarland (U.S. Pat. No. 6,628,673) (Ex. 1009)

McFarland teaches a method to allow channel sharing in a way that allows simple nodes such as cordless phones to transmit to a node at a low rate continuously while other high speed nodes transmit at a much higher rate simultaneously with the simple nodes to the same node. For example, McFarland teaches a system which implements multi-frequency communication but allows channel sharing between users in a way that would allow simple nodes such as a 32 kb/s cordless phone to transmit continuously at a low rate while other high speed nodes such as 20 Mb/s video streams communicate at a much higher data rate. Further, McFarland teaches that the transmit nodes use OFDM, where simpler nodes use a few subcarriers/subchannels whereas high

speed nodes use most of the subcarriers. The subcarriers are designed to be non-interfering. One method of assigning subcarrier in this manner involves adjusting the transmission of packets at the nodes according to closed-loop feedback signals sent by the base station. For example, the strength of each signal is adjusted at the node according to feedback signals sent to it by the base station, or by implementing an open-loop power control scheme in which the strength of each signal is adjusted at the node according to the power level of the base station signal it receives. (Ex. 1009.)

Ton (U.S. Patent No. 6,745,012) (Ex. 1010)

Ton discloses a data compression scheme for mobile telecommunications where data compression is applied to data packets so long as link quality is above a certain threshold. Because compression schemes are computationally intensive and require significant processing power, and because of the variable link quality in wireless networks, Ton discloses that a compressor associated with the transmitted signal is disabled in response to the link quality falling below this threshold. (Ex. 1010.) (Psounis Dec., ¶39.)

Claim Rejections - 35 U.S.C. § 103

Claims 53-56, 64-66, 70, 76, 81-84, and 87-94 are rejected under pre-AIA 35 U.S.C. § 103 as being unpatentable over U.S. Pat. App. Pub. No. 2004/0095907 to Agee et al. (“Agee”) in view of U.S. Pat. No. 6,628,673 to McFarland et al. (“McFarland”) further in view of U.S. Pat. No. 6,745,012 to Ton et al. (“Ton”).

For the reasons set forth below and supported by the expert declaration of Patent Owner’s expert Dr. Konstantinos Psounis (Ex. 2001 (“Psounis Dec.”)), Agee in view of McFarland and further in view of Ton does not teach or suggest multiple claim limitations of the challenged claims of the ’720 patent and neither Requester nor the Office Action have established a prima facie case

of obviousness, including demonstrating that a POSITA would have been motivated to combine the references as proposed, much less in the ordered combination of steps recited in the claimed methods.

In his Declaration (Ex. 1003), Requester's expert Mr. Geier states that he considered a "claim chart comparing claims 53-56, 64-66, 70, 76, 81-84, and 87-94" (Ex. AA) in forming his opinions. Accordingly, while Patent Owner addresses the opinions in Mr. Geier's Declaration, Patent Owner will also address the opinions and evidence cited in Ex. AA where relevant. Similarly, to the extent the Examiner adopts Mr. Geier's opinions in his Declaration or claim chart in its Office Action, Patent Owner's arguments below are intended to address the Office Action as well. To the extent the Examiner's reasoning diverges from Mr. Geier's opinions, Patent Owner separately addresses those points as well.

As an initial matter, the Office Action fails to make a prima facie case of obviousness as to each element of each challenged claim. As will be demonstrated in further detail in the subsequent pages, for many elements, neither the Office Action nor Mr. Geier identify specific disclosures in the asserted references at all that purportedly correspond to the limitations of the claims. To the extent they identify particular teachings in the asserted references for some claim elements, they fail to consider the challenged claims as a whole and as an ordered combination of elements each of which are related to other elements of the claims. Instead, they assume that the claims as a whole are obvious merely because some elements, standing alone, were purportedly taught by the references or allegedly would have been obvious to a POSITA. But analyzing the claims on a limitation by limitation basis without considering the claims as a whole is insufficient to show obviousness as a matter of law.

The deficiencies in the Office Action's analysis are set forth below with respect to claim 53. Because the remaining challenged claims all depend on claim 53, they are patentable for at least the same reasons.⁵

[53.1] receiving at a first node in the radio communications network an instruction transmitted from a second node in the radio communications network to avoid using a plurality of frequencies to transmit to the second node

Claim element [53.1] requires that a “first node” receive an “instruction” transmitted from a “second node” to “avoid using a plurality of frequencies to transmit to the second node.” For this claim element, the Office Action and Mr. Geier rely on both Agee and McFarland in combination. However, they fail to provide sufficient evidence that the proposed Agee-McFarland combination teaches this element or renders it obvious in the context of claim 53. (Psounis Dec. ¶ 42.)

Requester's expert, Mr. Geier, cites ¶¶ 179 and 180 of Agee for this limitation as teaching “feedback,” (*see* Ex. 1003, ¶75; Ex. AA at 4-5), but does not explain how anything in these paragraphs is an “instruction . . . to avoid using a plurality of frequencies.” For example, Mr. Geier does not explain how an “internode channel response,” a “rank,” or a “diversity channel distribution” correspond to the claimed “instruction.” (Psounis Dec. ¶ 43.)

The Office Action appears to agree that Agee does not teach element [53.1]. (OA at 5.) However, it then goes on to state that “McFarland discloses an analogous wireless adaptive communication system (see Abstract) in which a node may adjust the frequency used by that

⁵ USTA only addresses claim 53 for purposes of responding to the non-final office action but is not conceding that any limitations not addressed herein are disclosed by the asserted references and reserves the right to present additional arguments. Likewise, USTA is not proposing any claim constructions in this response but reserves the right to present claim construction arguments in the future in this or in other proceedings and nothing contained herein should be interpreted as adopting a particular construction under the Phillips standard for claim construction.

node (see column 7, lines 37-40 and column 3, lines 7-14) based upon feedback from a base station (see column 4, lines 34-50), which leads to the node sending requests to the base station for channel reallocation, see column 5, lines 40-57).” (OA at 5-6.) (Psounis Dec. ¶ 44.)

McFarland does not teach or suggest an instruction that is sent from the second node to the first node *that is then used by the first node to filter a plurality of frequencies for communication with the second node*, as required by claim element [53.2]. (Psounis Dec. ¶ 45.) For this claim element, Requester cites McFarland at 3:7-14 (“adjusting the frequency used by each node according to closed-loop feedback signals sent by the base station”), 4:34-50 (“When the unit 450 determines that nodes should change channels, it issues appropriate command as a data packet which is included in the transmission of base station 400”), 5:40-57 (“the unit 350’ can cause the laptop 300 to send requests to the base station 400 to change or reallocate channels. Depending on constraints imposed by other nodes, the base station 400 may or may not accept the recommendation and transmit the appropriate command”), and 7:37-40 (“frequency control may be implemented by allowing the base station 400 to feed back information to the node in the form of a command signal, adjusting the transmit frequency in a closed loop system”). (Ex. AA at 5-6.) Mr. Geier cites to column 5:40-57 in his declaration. (Ex. 1003, ¶77.) (Psounis Dec. ¶ 46.)

Requester and Mr. Geier mischaracterize the disclosures of McFarland. First, at col. 3:7-14, McFarland describes the operation of a **base station** in “locking the frequency used by each node . . . and adjusting the frequency used by each node . . .”:

According to a second aspect of the present invention, simple low data rate nodes are allowed to use a small number of sub-channels while the more complicated nodes use the remainder, and additional means are used to ensure that adjacent sub-channels are reliably spaced apart in frequency so that they do not bleed over into one another. This may be done by, e.g., using highly

accurate frequency references (such as quartz crystals) in each node; locking the frequency used by each node to a highly accurate external reference such as a Global Positioning System (GPS) satellite; **locking the frequency used by each node to the transmit frequency of the base station; and adjusting the frequency used by each node according to closed-loop feedback signals sent by the base station.**

(Ex. 1009 at 3:1-14.)⁶ Additionally, at column 4:42-50, McFarland discloses that the base station's channel allocation and coding unit 450 makes channel allocation and coding decisions and may issue commands that are sent in base station transmissions. Therefore, the base station, and not any individual node such as a laptop, determines the frequencies to be used by each node. (Psounis Dec. ¶ 47.)

This context is important with respect to the cited disclosure at column 5:40-57 of McFarland. Specifically, it is in this context (i.e., in which the laptop is not “unilaterally making channel allocation changes”) that McFarland states a laptop may “send requests to the base station 400 to change or reallocate channels”:

Channel allocation and coding unit 350' in the laptop 300 monitors the datadstreams [sic] 310' for bit errors, lost packets and the like much like its counterpart 450 in the base station 400; ***however, rather than unilaterally making channel allocation changes to improve communication like the unit 450, the unit 350' can cause the laptop 300 to send requests to the base station 400 to change or reallocate channels.*** Depending on constraints imposed by other nodes, the ***base station 400 may or may not accept the recommendation and transmit the appropriate command.***

(Ex. 1009 at 5:40-57.) In other words, while the laptop may send a request to the base station, the base station still determines what frequencies are to be used by the laptop. This is consistent with the other disclosures in McFarland in which the base station controls other

⁶ All emphasis is added unless indicated otherwise.

nodes' use of frequency, (column 7:33-40), timing, (column 7:63-8:4), and power, (column 8:16-33). (Psounis Dec. ¶ 48.)

In view of this, McFarland does not disclose an instruction from a node to the base station for the base station to avoid using a plurality of frequencies to transmit to the node. Rather, as explained further in connection with element [53.2], in McFarland, any filtering of transmissions purportedly taught by McFarland is performed *at the node*. (Psounis Dec. ¶ 49.)

This aspect of McFarland's operation is further exemplified by the claims of McFarland, which demonstrate that only a base station is capable of instructing nodes in a communication system as to specific frequencies to be used by those nodes:

10. A communication system comprising:

a base station for transmitting a signal representative of a plurality of non-overlapping sub-channels conveying information, a plurality of groups of sub-channels each corresponding to one of a plurality of nodes;

wherein the nodes are for simultaneously receiving the signal transmitted by the base station and processing it to generate, for each information-conveying sub-channel corresponding to the node, a data stream representative of the information conveyed thereby,

the base station is for using multiple sub-channels simultaneously to transmit to at least one of the nodes,

the base station is for intelligently changing an assignment of nodes to sub-channels used by those nodes for optimal reception of transmitted signals, and *the base station* is for intelligently changing the assignment of nodes to channels to minimize at least one of fading and interference.

6. A communication system comprising:

a base station for transmitting a signal representative of a plurality of non-overlapping sub-channels conveying information, a plurality of groups of sub-channels each corresponding to one of a plurality of nodes, *the base station* including means for generating and transmitting a command signal to the at least one node based on the power of signals from the at least one node as received by the base station;

frequency controlling means for controlling the frequencies of *signals transmitted by the at least one* node; and,

power control means for controlling power of signals sent by the at least one node, the power control means being disposed in the at least one node and being responsive to command signals from the base station transmitted to the at least one node;

wherein the nodes are for simultaneously receiving the signal transmitted by the base station and processing it to generate, for each information-conveying sub-channel corresponding to the node, a data stream representative of the information conveyed thereby.

In summary, neither Requester nor Mr. Geier identify any teachings in Agee, McFarland, or in the proposed Agee-McFarland combination of the claim requirement that a second node transmit an instruction to a first node, which the first node then uses to filter frequencies used to communicate with the second node.⁷ Therefore, Requester and Mr. Geier have failed to make a prima facie case of obviousness as to element [53.1] in the context of claim 53.

With respect to the Office Action, the Examiner appears to agree that Agee does not disclose this limitation. However, the Office Action states:

McFarland discloses an analogous wireless adaptive communication system (see Abstract) in which a node may adjust the frequency used by that node (see column 7, lines 37-40 and column 3, lines 7-14) based upon feedback from a base station (see column 4, lines 34-50), which leads to the node sending requests to the base station for channel reallocation, see column 5, lines 40-57). One skilled in the art would recognize that this implementation because this would allow for more efficiency by allowing nodes to manage frequencies by simply sending instructions (see James T. Grier Declaration at 50).

⁷ While Requester and Mr. Geier do not advance this theory, it is similarly implausible that the base station in McFarland could serve as the claimed “second node” and the “laptop 350” as the claimed “first node.” As demonstrated above, claim 53 specifically recites that the “first node” be capable of simultaneous transmission to a “second node” and a “third node.” There is no teaching or suggestion in McFarland that a laptop could satisfy this requirement.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented the invention of Agee by using McFarland's teachings to allow for instructions to be used to select channels to achieve Agee's use of certain channels for power optimization.

(OA at 5-6.) However, it is not clear from the Office Action what disclosure in McFarland is being relied on as allegedly teaching claim element [53.1] (e.g., feed back from the base station, a request for channel reallocation, a base station command signal, or something else?).

The Office Action cites to Mr. Geier's declaration at paragraph 50, but that does not clarify the basis for the Office Action's assertion that Agee and McFarland render this claim element obvious. In that paragraph, Mr. Geier alleges that "McFarland discloses an embodiment in which both the base station and nodes can send instructions to each other regarding what frequencies to avoid during their transmissions using feedback or 'command' signals." (Ex. 1003, ¶50.) (Psounis Dec. ¶ 50.) However, as noted above, none of the disclosures in McFarland teach claim element [53.1], particularly when viewed in the context of the other claim elements recited in claim 53.⁸

Likewise, it is not clear what the Office Action intended to convey with the following statement: "One skilled in the art would recognize that this implementation because this would allow for more efficiency by allowing nodes to manage frequencies by simply sending instructions." (OA at 6 (citing Ex. 1003, ¶50).) The citation to Mr. Geier's declaration is not helpful because Mr. Geier does not discuss any purported increased efficiency in that paragraph. He also does not discuss any purported increased efficiency in paragraphs 49, 51, 52 or 53 of his declaration. Moreover, his assumption that a POSITA would have concluded that there was a

⁸ In the event the Patent Office later articulates the specific basis for its assertion of obviousness with respect to claim element [53.1], Patent Owner respectfully reserves the right to offer further argument in response.

benefit is unsupported. (Psounis Dec. ¶ 51.) Even Mr. Geier admits that the proposed combination of Agee and McFarland (as best as can be ascertained) “would *not* have affected how the method of Agee would have operated.” (Ex. 1003, ¶52.)

[53.2] filtering a transmission signal to remove power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

Claim element [53.2] requires filtering a transmission signal to remove power at each frequency in the plurality of frequencies to be avoided. The Office Action and Mr. Geier fail to provide sufficient evidence that the proposed Agee-McFarland combination teaches this element. (Psounis Dec. ¶ 52.)

The Office Action asserts that Agee in combination with McFarland renders this claim element obvious. The Office Action’s analysis for this claim element is reproduced below:

Although Agee discloses the use of band pass filters (see paragraph 274 and figure 5, occurs in both directions, see paragraph 280, per node adjustments are independent of one another, see paragraph 478), Agee does not disclose a mechanism for using this to remove power from the transmission signal specifically at each frequency in the plurality of frequencies to be avoided.

McFarland elaborates on this mechanism, in which filtering is performed as required on an individual basis, and channels not to be used are zeroed (see column 2, lines 57-67; column 4, lines 51-61; and column 8, lines 16-22). One skilled in the art would find it advantageous to use McFarland’s teachings to choose where to implement filtering (see Grier at 56-57).

Therefore it would have further been obvious to one of ordinary skill in the art at the time the invention was made to modify Agee by performing channel adjustments on an individual basis, as per McFarland, in order to more easily choose where to implement filtering.

(OA at 6-7.) (Psounis Dec. ¶¶ 53-54.)

As discussed above, Agee's disclosure in paragraph 478 refers to adjusting transmit power using weights in reciprocal channels as is clear from the proceeding paragraphs. (Ex. 1008, ¶¶477-78.) Likewise, as discussed earlier, the general disclosure of band pass filters in Agee, including in paragraphs 220 and 274, does not disclose or suggest the filtering step of claim element 53.2 in the context of claim 53. (Psounis Dec. ¶ 55.) Agee, alone or in combination with McFarland, does not disclose or suggest filtering a transmission signal with respect to the claimed first node to remove power at frequencies specified in a received instruction. Further, while the Office Action cites to Figure 5 of Agee, that appears to be a typographical error. Whether the Examiner meant to refer to Figure 15 or Figure 25, neither of these figures changes the fact that Agee and McFarland in combination fail to disclose or render obvious claim element 53.2 in the context of claim 53. (Psounis Dec. ¶ 56.)

The Office Action at pages 6-7 also cites the same disclosures in McFarland discussed above and for the same reasons these disclosures when considered in combination with Agee do not disclose or render obvious claim element 53.2 in the context of claim 53. (Psounis Dec. ¶ 57.)

The Office Action at pages 6-7 also cites disclosures in McFarland. However, the cited paragraph explains that the filtering (or removal) of frequencies occurs at node 300, not at the base station (i.e., not at the first node alleged by Requester):

As can be seen above, this embodiment of the present invention permits **multiple node devices 100-300 of varying levels of complexity to communicate with a base station 400 over a single OFDM system** by allowing the simpler devices 100 and 200 to communicate on a few sub-channels 315 within the OFDM channel, and ensuring that **these do not interfere with the most complex device 300 using most of the sub-channels 310 by preventing device 300 from using these sub-channels 315 (in this case, by zeroing those sub-channels 315** at the FFT 420 in the main device 300; however, other equivalent methods can of course be used). Further, the sub-channels 315 may be predetermined, or the simpler nodes 100 and 200 can communicate on any subset of channels by changing the tuning of their up-

converting synthesizers, or by doing a numerical frequency offsetting in the digital domain, although a digital-to-analog converter might be needed in that case.

(Ex. 1009 at 4:51-67.) (Psounis Dec. ¶ 57.)

As previously explained, there is no teaching in McFarland that any removal of power at specific frequencies occurs at the base station corresponding to the frequencies identified in an instruction received at the base station. Indeed, in the same paragraph the Examiner relies on, McFarland goes on to clarify that “the sub-channels 315 may be *predetermined*, or the simpler nodes 100 and 200 can communicate on any subset of channels by *changing the tuning of their up-converting synthesizers*, or by doing a numerical frequency offsetting in the digital domain.” (Ex. 1009 at 4:61-67.) Nothing in this paragraph would have suggested to a POSITA that a base station would remove power from any frequencies identified in a received instruction in the context claimed. (Psounis Dec. ¶¶ 59-60.)

The Examiner is similarly mistaken that a POSITA “would find it advantageous to use McFarland’s teachings to choose where to implement filtering” and that it would have been obvious “to modify Agee by performing channel adjustments on an individual basis, as per McFarland, in order to more easily choose where to implement filtering.” (OA at 6-7.) (Psounis Dec. ¶ 59.) As noted above, McFarland discloses zeroing channels at the *nodes, not the base station* that Requester equates with the first node recited in claim 53. Thus, to the extent McFarland discloses options for where to implement the purported filtering, none of those options correspond to the first node recited in claim 53, much less that the filtering of the transmission signal removes power at frequencies identified in an instruction received by the first node where the filtered transmission signal is sent to a second node. When this claim element is also considered with the other elements of claim 53, including [53.8], the deficiencies in the proposed combination of references become even more clear. (Psounis Dec. ¶ 59.)

The Office Action cites to Mr. Geier's declaration at ¶¶56-57 in support of the statement that a POSITA "would find it advantageous to use McFarland's teachings to choose where to implement filtering". (OA at 6.) However, as discussed above, McFarland does not disclose filtering a transmission signal to remove power at frequencies identified in an instruction received by the base station before the filtered transmission signal is sent to a node in the context of claim 53. (Psounis Dec. ¶ 60.)

Additionally, in paragraph 56 of his declaration, Mr. Geier states that:

McFarland explicitly discloses "zeroing" certain sub-channels, through power control, to ensure no interference between nodes of varying complexities. This means McFarland contemplates that nodes can filter signals by removing power from certain channels (i.e., frequencies) that are off. Given this disclosure, a POSITA would have been motivated to look to another reference, such as McFarland, that discloses a way to filter signals to remove power from certain frequencies in a transmission signal.

(Ex. 1003, ¶56.) This argument does not make sense. Mr. Geier refers to an alleged teaching in McFarland and then states "[g]iven this disclosure, a POSITA would have been motivated to look to another reference, such as McFarland" (Ex. 1003, ¶56.) This internally incoherent statement does not provide support for the Office Action's statements. (Psounis Dec. ¶ 61.)

In addition, a POSITA would not have been motivated to combine Agee and McFarland as proposed because Agee and McFarland are directed to different problems and Agee already addresses the issue of interference such that a POSITA would not have looked to McFarland for any improvement as suggested in the Office Action and by Mr. Geier. For example, Agee discloses that the issue of interference is already addressed via the diversity channels which gain the benefits of orthogonality. (Ex. 1008, ¶ 176.) In contrast, McFarland discloses a number of methods to have low rate nodes pick certain sub channels to transmit while higher rate nodes use the rest of

the sub channels simultaneously, and ensures no interference by having sub channels which do not overlap. In other words, not only the two patents solve different problems, but also the problem of no interference between simultaneous transmissions is already addressed by Agee with the “orthogonality” of the spatially separated diversity based channels. (Psounis Dec. ¶ 62.)

Mr. Geier alleges that “a POSITA would have been motivated to look at another reference *such as McFarland*” and that “a POSITA would have been motivated to make such a combination because the disclosure of restricting channels or frequencies of transmissions in Agee *could have caused them to look to McFarland* for how to implement filtering of the signals to remove power from the frequencies to be avoided.” (Ex. 1003, ¶56.) Likewise, in paragraph 57, Mr. Geier states “It is my opinion that a POSITA would have been motivated to make such a combination because the disclosure of using a band pass filter to filter transmission signals in Agee could have caused them to look to McFarland for how to better operate a system that utilizes feedback across nodes in a network to instruct the band pass filtering in Agee accordingly.” (Ex. 1003, ¶57.) Mr. Geier’s statements in paragraphs 56 and 57 of his declaration are insufficient to support a finding that a POSITA would have been motivated to combine Agee and McFarland as proposed. (Psounis Dec. ¶ 61.)

Specifically, Mr. Geier is arguing that a POSITA “could have” considered combining Agee with other references that could include McFarland. As noted below, that is insufficient as a matter of law. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“obviousness concerns whether a skilled artisan *not only could have made but would have been motivated* to make the combinations or modifications of prior art to arrive at the claimed invention.”)

Relatedly, with respect to Mr. Geier’s statement in paragraph 58 of his declaration that the proposed modification of Agee in view of McFarland “would not have affected how the method

of Agee would have operated,” (OA at 6-7), this statement undermines rather than supports there being a motivation to combine, even if Mr. Geier is making the statement in the context of whether a POSITA would have had a reasonable expectation of success in combining the references. (Psounis Dec. ¶ 61.)

The remaining disclosures Mr. Geier cites are even further removed from this element. For example, Mr. Geier cites 8:16-19 (*see* Ex. AA at 8; Ex. 1003, ¶78), which describes that the base station may send signals to each node “which indicate whether each node 100-300 should transmit with more or less *power*.” (Ex. 1009 at 8:16-19.) This paragraph has nothing to do with removing power from specific frequencies identified in an instruction received by the base station using a band pass filter. Instead, McFarland is describing scenarios where nodes transmit a signal to the base station that is too strong or too weak. Accordingly, the *base station instructs each node* as to the optimal power to transmit with:

In a third operational consideration in the invention, all signals transmitted from nodes 100-300 preferably arrive at the base station 400 with similar power levels. This is because a signal that is much too strong would swamp the ADCs in the base station 400, while a signal transmitted from one of nodes 100-300 that is much too weak would be lost in the noise from the other channels and not reliably received by the base station 400.

Similar to the above closed-loop control techniques, the system may use the base station 400 to send signals to nodes 100-300 which indicate whether each node 100-300 should transmit with more or less power. The system may alternatively implement open-loop control by having each node 100-300 adjust its power based on the power level it is receiving from the base station 400.

(Ex. 1009 at 8:8-22.) Similarly, at column 2:57-60, McFarland merely states “It is still another object of the present invention to provide such a system in which node transmission powers can be reliably controlled so that they do not cause communication errors.” (*See* Ex. 1003, ¶78.) In

McFarland, the reference to nodes excludes the base station. This does not disclose or suggest claim element [53.2] in the context claimed. (Psounis Dec. ¶ 58.)

Moreover, Agee does not teach or suggest an instruction sent from the second node to the first node to avoid using a plurality of frequencies to transmit to the second node. The Examiner appears to agree. (OA at 5.) Nevertheless, Mr. Geier appears to rely on Agee as teaching element [53.2]. (Ex. 1003, ¶¶78-81; Ex. AA at 6-8.) But because Agee fails to teach element [53.1], it also does not teach that any “filtering” of a transmission signal to remove power “in the plurality of frequencies to be avoided,” which in turn is specified by the “instruction” of element [53.1]. Each of Mr. Geier’s opinions based on Agee fails for at least this reason.

Mr. Geier also asserts that “[a] POSITA would have understood that one way to achieve the desired result of the band pass filter in Agee is to ‘remove power’ from certain frequencies outside of a defined range of frequencies set by the filter.”⁹ (Ex. 1003 at ¶ 80; Ex. AA at 7; *see also* Ex. 1003, ¶78 (citing Ex. 1008, ¶¶220, 274).) However, a generic description in Agee of a “band pass filter” does not support a finding of obviousness for the specific limitations recited in claim 53 even where band pass filters were known to a POSITA because Agee does not teach, and Mr. Geier does not identify any disclosures, that band pass filtering in Agee is applied to a transmission signal to remove power at frequencies specified in an instruction received by the first node as required by claim 53.

In another paragraph cited by Mr. Geier, Agee is merely discussing the capability to independently adjust power using weights in reciprocal channels that may be substantively nulling as the preceding paragraph makes clear. (*See* Ex. AA at 8, citing Ex. 1008 ¶¶ 477-78 (“this

⁹ It is not clear what Mr. Geier means by “the desired result of the band filter,” (Ex. 1003, ¶80), but it suggests that Mr. Geier is relying on improper hindsight using the claims as a roadmap to pick and choose from the references’ disclosures.

capability *allows nodes to independently adjust transmit power directed to other nodes in the network*, for example, to optimize capacity achievable at that node given the total power [available] to it, or to minimize power emitted into the network by that node given an aggregate power requirement.”.) This general discussion of adjusting transmit power does not refer to filtering a transmission signal to remove power at each frequency of a plurality of frequencies identified in a received instruction in the context of claim 53.

For at least these reasons, Requester and Mr. Geier have failed to make a prima facie case of obviousness as to element [53.2].

[53.3] transmitting the filtered transmission signal to the second node

For the same reasons noted above with respect to claim elements [53.1] and [53.2], and for the reasons set forth below in more detail with respect to [53.4], [53.6] and [53.8], Agee alone or in combination with McFarland and/or Ton fail to disclose claim element [53.3] which refers to “*the* filtered transmission signal” in the context of claim 53. (Psounis Dec. ¶ 63.)

[53.4] receiving a compressed first feedback from the second node that characterizes receipt of a first signal sent from the first node to the second node

Claim element [53.4] requires that the first node additionally receive a compressed first feedback from the second node that characterizes receipt of a first signal sent from the first node to the second node. Requester and Mr. Geier fail to provide sufficient evidence that the proposed Agee-Ton combination¹⁰ teaches this element, for at least four reasons. (Psounis Dec. ¶ 64.)

First, as set forth above in connection with elements [53.1] and [53.2], Agee does not teach the claimed “first node” and “second node,” and therefore does not describe that *the first node* receives a compressed feedback from *the second node* in the context claimed in claim 53. (Psounis

¹⁰ Mr. Geier does not rely on McFarland for this element. (See Ex. 1003, ¶¶84-87; Ex. AA at 11-14.)

Dec. ¶ 65.) The Office Action recognizes that “Agee in view of McFarland does not disclose [sic] that the feedback may be compressed.” (OA at 7.) (Psounis Dec. ¶ 65.)

Mr. Geier makes a sweeping generalization regarding Agee, stating it “teaches feedback across all nodes in the network” in an attempt to overcome these deficiencies:

Agee teaches dynamic feedback across all nodes in the network—in other words, feedback in Agee is not only sent by the base station (*first node*) to SUs (*second node*); it can also be sent from an SU (*second node*) to a base station (*first node*) as well as other nodes in the network. Ex. 1008, ¶ [0172]. The capability of all nodes in the network to send feedback without restriction is a problem Agee attempts to solve over the prior art. *See id.* (“the feedback is neither limited to BSs only, nor effectively independent of the continual, real-world, signal and network environmental adaptation.”).

(Ex. 1003, ¶85; Ex. AA at 11.) However, the “antecedent bases” for the first node and the second node recite the specific functionality performed by each node, and Mr. Geier is not free to disregard these particularized requirements, nor the requirements set forth in the latter claimed steps of claim 53.

However, that is precisely what Mr. Geier has done. (Ex. 1003, ¶¶84-87.) For example, Mr. Geier does not identify any teachings in Agee regarding receiving a compressed feedback from *the same* “second node” that the first node receives an instruction from regarding avoiding a plurality of frequencies as set forth in [53.1] where the compressed feedback from the second node “characterizes receipt of a first signal sent from the first node to the second node” as required by element [53.4].

While Mr. Geier cites ¶172 of Agee to opine that “feedback is [not] limited to BSs only,” (*see* Ex. 1003, ¶85; Ex. AA at 12), nothing in that paragraph corresponds to any receiving of an instruction from “a second node” by “the first node” “to avoid using a plurality of frequencies to transmit to the second node” or receiving “a compressed first feedback from the second node that

characterizes receipt of a first signal sent from the first node to the second node” as also recited in claim 53. Mr. Geier simply assumes that these vague and generalized statements in Agee would have sufficiently informed a POSITA of the “first node” and “second node” elements of the claim; however, he does not provide any evidence of this assumption. Therefore, Requester and Mr. Geier fail to support their assertion that claim 53 would have been obvious.

Second, Mr. Geier does not provide any evidence in the Agee-Ton combination of a “compressed first feedback that characterizes receipt of a first signal sent from the first node to the second node” as required by this claim element in the context of claim 53. Mr. Geier and the Examiner recognize that “Agee in view of McFarland does not disclose [sic] that the feedback may be compressed.” (OA at 7.) Mr. Geier relies on Ton instead, opining that Ton’s “method and system for performing adaptive data compression in a wireless communication network . . . to compress at least a portion of a data packet,” (Ex. 1003, ¶86; Ex. AA at 11) in combination with Agee meets this element. However, these teachings of Ton are irrelevant to whether the proposed Agee-Ton combination discloses or renders obvious the step of receiving a “compressed first feedback that characterizes receipt of a first signal” from the first node in the context of claim 53. (Psounis Dec. ¶ 68.)

As the cited portions of Ton explain, the compression methods in Ton relate to *payload* data, not control data as the claim requires. (Psounis Dec. ¶ 69.)

The present invention is directed in general to **data compression in a mobile telecommunications system**, and in particular to **adapting compression for efficiently transporting data** in a mobile telecommunication network.

Ton (Ex. 1010), 1:9-12.

There is a need, therefore, for a system and method of efficiently and effectively compressing data in a wireless telecommunication network. Preferably, such a system and method would **achieve a substantially optimal balance between**

compression and successful data recovery. In addition, such a system and method would preferably **minimize inefficient uses of processing power and memory.**

Id., 1:44-50.

In another embodiment of the invention, **a mobile telecommunications system includes a compressor for compressing at least a portion of a data packet to be transmitted 65** via an air interface.

Id., 1:63-66; see also 2:7-9 ("The mobile station includes a compressor.")

However, this claim element requires receiving compressed first feedback *that characterizes receipt of a first signal sent from the first node to the second node*, which is understood by a POSITA to describe *control data* transmitted from the second node to the first node. (Psounis Dec. ¶ 69.)

This control data (i.e., the "compressed first feedback" is recited in elements [53.6] and [53.8] to control the transmit power to the second node and a third node. Mr. Geier does not offer any evidence that Ton's teachings of compressing payload data would have motivated a POSITA to compress feedback information from the second node wherein a first filtered transmission signal is sent to the second node using an OFDM-based protocol using a first power based on the compressed feedback information as recited in claim 53. (Psounis Dec. ¶ 67.)

Indeed, data compression was known for decades prior to the inventions of the '720 patent. One of the inventive aspects of claim 53 is the use of compression specifically for feedback from a node receiving payload data (here, the "second node") to the node that sent the payload data (here, the "first node"). (Psounis Dec. ¶ 69.) The compression is applied to the control signal sent back to the node transmitting the data, and not to the payload data sent from the node actually transmitting payload data (such as an HTML web page, email, etc.) The idea of using compression specifically for control data was first described in the IEEE 802.11n-2009 standard, well after the

earliest effective filing date of the '720 patent, and became more widespread in the IEEE 802.11ac-2013 standard for MIMO feedback. Prior IEEE 802.11 WiFi standards did not utilize compression for control data. (Psounis Dec. ¶ 69.) Therefore, a POSITA as of the earliest effective filing date of the '720 patent would not have been aware of, and would not be motivated to, transmit compressed control data. (Psounis Dec. ¶ 69.)

Third, to the extent a POSITA would be motivated to compress control data in view of Ton, the proposed Agee-Ton combination would teach away from the transmission of compressed feedback information from the second node to the first node that specifically characterizes receipt of a first signal sent from the first node to the second node. (Psounis Dec. ¶ 70.) The portions of Agee cited by Mr. Geier explain that Agee teaches the use of incorporated control and feedback information, or internalized feedback information within a node:

A second key to this approach is the minimization of secondary consequences of signaling, and a second is *using internalized feedback, so that the signaling process itself conveys information crucial to the optimization*. Rapid, dynamic, adaptation reactive to the changing environment and communications within and surrounding each node and the entire network is used to promote both local and global efficiency.

Ex. 1008, ¶172.

The incorporation of the control and feedback signal as part of the process rather than as discrete, separate, and particular parts of the signal, *can decrease the complexity of apparatus by removing the need for a separate channel for network control*. .. This integration allows both capacity and power control to cooperatively handle packet acknowledgement... the present form of the invention provides increased capacity and performance through dynamic, and self-moderating signal processing algorithms, with a minimal overhead.

Id., ¶¶249-250.

One major difference in the present embodiment of the invention from prior art is that by *making the control and feedback aspects part of the signal encoding*

process, and thereby eliminating or at least reducing the need for a separate channel(s) for control and feedback, the network content overhead is reduced and an additional range within the Signal dimension is available for Signal content. The LEGO reduction to single, or small, bit sized power management signals can be similarly echoed for other network management, depending on the target objective the network elects.

Id., ¶244.

By using target criteria such as (1) for a cellular network, a max- min capacity criterion Subject to a power constraint, or (2) for a wireless LAN, a max-sum capacity that is subject to a power constraint, and using simple comparative operations in feedback for the network to optimize towards those criteria, this invention enables flexibility and stability for any given hardware and software combination that underlies a wireless electromagnetic communications network and improves, for the entire network and at each particular node thereof, the communication capacity and power requirements. Furthermore, the present form of the invention does not ignore but rather directly addresses and resolves both the overhead vs. content and the power vs. capacity conundrums which otherwise limit present-day state of the art approaches to optimization. ***It does this using the experienced environment as part of the direct feedback, rather than requiring additional control information or signalling that reduces content capacity.***

Id., ¶193.

In contrast, the '720 patent claims and describes receiving a separate compressed feedback signal from the second node. (Ex. 1001 at 22:21-26 (“In a preferred embodiment, node 1400 would ***also*** provide feedback information to neighboring node 1460 to assure that the signal neighboring node 1460 sends back to node 1400 arrives with the same power level as that of every other neighbor, minimizing problems of near-far receiver masking.”).) Mr. Geier does not provide any evidence that the proposed Agee-Ton combination teaches the use of such feedback. Nor does he offer any evidence that any “feedback” described in Agee is used to determine transmit power for subsequent transmissions to the node. (Psounis Dec. ¶ 71.)

Fourth, Mr. Geier does not rely on McFarland for this element. (*See* Ex. 1003, ¶¶ 84-87; Ex. AA at 11-14.) This omission is inconsistent with his theories as to elements [53.1] and [53.2]. (Psounis Dec. ¶ 72.) There, Mr. Geier appears to rely on McFarland as a necessary element for teaching an “instruction” transmitted from the second node to the first node, while also relying on Agee’s disclosure of “feedback.” (*See* Ex. 1003, ¶¶ 74-81; Ex. AA at 3-8.) Mr. Geier then relies on the same “feedback” in Agee as also meeting the “first compressed feedback” of element [53.4]. (Ex. 1003, ¶¶ 84-85; Ex. AA at 11-13.) But in doing so, Mr. Geier fails to acknowledge the relationship between the “instruction” of element [53.1] and the “first compressed feedback” of element [53.4]. Nor does Mr. Geier explain how, without McFarland, the proposed Agee-Ton combination teaches both the “instruction” and the “first compressed feedback” elements of the claim. His omission of McFarland in element [53.4] is therefore fatal to his obviousness theory because he fails to identify **both** an “instruction” and a “first compressed feedback” transmitted from the second node, as the claim requires. (Psounis Dec. ¶ 72.)

The Examiner appears to overlook this discrepancy and states that “it would have been obvious to [a POSITA] to have modified the invention of Agee **and McFarland** by using data compression and decompression, as per Ton, to reduce the amount of bandwidth and power needed for transmitting.” (OA at 7.) However, the Examiner similarly fails to cite any evidence of the presence of **both** an “instruction” and a “first compressed feedback” in this proposed combination (which is different from Mr. Geier’s proposed combination and incorrect for additional reasons as discussed herein). (Psounis Dec. ¶ 73.) Despite these deficiencies, the Office Action also states:

Ton discloses the general compressing of transmissions in any node in wireless data networks and that compressed data packets require less bandwidth to transmit (see column 3, lines 31-43), as well as corresponding decompression (see column 3, line 56 to column 4, line 3). One skilled in the art would also recognize that this would also reduce the amount of power needed to transmit (see Grier at 87).

(OA at 7.)

The Office Action's assertion that a POSITA would have been motivated to modify Agee and McFarland by using data compression and decompression per Ton to reduce the amount of bandwidth and power needed for transmitting does not account for the references other teachings that would discourage a POSITA from pursuing the proposed combination. (Psounis Dec. ¶ 74.)

As Ton discloses:

Implementation of a data compression scheme, however, uses extensive processing resources. If the data compression does not work, then resources are essentially being wasted. For example, when the bit error rate in a wireless telecommunication network increases, it is likely that transmitted data will not be decompressed correctly on the receiving end of the air interface. In such a situation, the decompressor typically detects that the received packets cannot be properly decompressed and requests that the data be resent. In addition, the decompressor begins discarding received packets until the decompressor is able to resynchronize with the compression scheme. In the meantime, however, the compressor makes inefficient use of processing resources and bandwidth by trying to compress the data packets and send them over the air interface link, even though the data packets are simply being discarded by the decompressor.

(Ex. 1010 at 2:38-53.) To address these concerns, and in doing so validating their legitimacy, Ton discloses that the compressor is disabled for a certain amount of time whenever the link quality falls below a certain threshold. (Ex. 1010 at 2:54-64.) (Psounis Dec. ¶ 75.) However, Agee includes repeated statements regarding the desire to minimize complexity and power consumption and reduce overhead and costs associated with its network system, and to conserve

power. (E.g., Ex. 1008, ¶¶15, 20, 48, 69, 96, 99, 249-252, 257, 264, 523.) Agee also discloses concerns about costs associated with additional hardware requirements for example, as illustrated in paragraph 237:

The approaches currently described in the field, . . . require additional hardware at each node comprising one end of a channel per diversity path to exploit that diversity path. This creates a geometric growth in the hardware complexity for each particular node, and a linear growth in cost for each diverse path exploited by a given network, that rapidly renders any network attempting to exploit such diversity uneconomic. Moreover, such an approach 'muddies its own stream' in that it reduces the capacity increase by the power increase needed to power the more complex transceiver. Exploitation of this multipath approach requires both high power (to permit data transport over the relatively weaker additional diversity path) and complex codecs (to permit data transports at high rates on the dominant path by filtering out the diversity path transmissions).

(Ex. 1008, ¶237.) A POSITA would have recognized the same concern with respect to requiring compression and decompression solutions at each node based on the teachings of Ton and Agee as well as McFarland. (Psounis Dec. ¶ 76.)

These concerns are further exacerbated by the fact that Ton's compression and decompression solution does not function below a certain threshold link quality, (Ex. 1010 at 2:54-64), and thus may not function in a host of network environments contemplated by Agee, or with the a variety of simple node types contemplated by McFarland in comparison to the "new wireless data communication systems" contemplated in Ton, (Ex. 1010 at 2:34-36). (Psounis Dec. ¶ 77.) Ton also readily acknowledges that "In the wireless context, however, the use of compression introduces a number of problems. First, *compression schemes require high processing power*, while it is typically desirable to reduce the amount of resources used in a wireless telecommunications system. For example, mobile stations generally have a limited power supply, and it is therefore beneficial to reduce the amount of power used by the processor in the mobile

station.” (Ex. 1010, 1:22-30.) This is directly contrary to the Office Action’s assertion that modifying Agee with Ton’s teachings regarding compression and decompression would have resulted in power savings. (OA at 7.) (Psounis Dec. ¶ 78.) Ton also discloses:

Wireless networks, on the other hand, often have a higher and much more variable hit error rate caused by the combination of mobile station mobility and the use of an air interface as a transmission medium. As a result, when the wireless quality deteriorates (i.e., a high bit error rate exists), some data packets may be lost, thereby causing decompression on the receiving end to fail to regenerate the 40 packet data. Such a situation causes an *inefficient use of processing power* because data packets are being compressed on the transmitting end, even though the data packets cannot be regenerated.

(Ex. 1010 at 1:33-43.) In view of these disclosures, and that the proposed modification to Agee is directed to feedback signals rather than data, a POSITA would not have had a motivation to combine the references as proposed by Requester or the Examiner, nor would they have had a reasonable expectation of success either. (Psounis Dec. ¶ 79.)

[53.5] receiving a compressed second feedback from a third node that characterizes receipt of a second signal sent from the first node to the third node;

Claim element [53.5] additionally requires the step of receiving a compressed second feedback from a third node that characterizes receipt of a second signal sent from the first node to the third node.

For at least the reasons identified for element [53.4] above, Requester and Mr. Geier fail to provide sufficient evidence that the proposed Agee-Ton combination¹¹ teaches this element or would have rendered it obvious. Likewise, the Office Action is incorrect in asserting that this claim element would have been obvious in the context of claim 53 for at least the same reasons. (Psounis Dec. ¶ 80.)

¹¹ Mr. Geier does not rely on McFarland for this element.

[53.6] decompressing the compressed first feedback resulting in a decompressed first feedback

Claim element [53.6] requires the step of decompressing the compressed first feedback resulting in a decompressed first feedback. (Psounis Dec. ¶ 81.)

For the reasons set forth for element [53.4] above, Requester and Mr. Geier fail to provide sufficient evidence that the proposed Agee-Ton combination¹² teaches this element or would have rendered it obvious in the context of claim 53 because at a minimum they fail to show that the combination teaches a “compressed first feedback.” (Psounis Dec. ¶ 82.)

Specifically, Mr. Geier merely cites generalized teachings of “feedback” in Agee and a “decompressor” in Ton as meeting this element. (See Ex. AA at 18-20, citing Ex. 1008 at ¶¶ 214, 163, 172, 249-50, 244, 193; Ex. 1010 at 3:56-59, 3:65-4:3.) However, Mr. Geier does not offer any evidence of decompressing any control information that characterizes receipt of a first signal, as elements [53.6] and [53.4] require. Nor does Mr. Geier offer any evidence that any such “decompressed first feedback” in his proposed combination is the basis for the transmit power for subsequent transmission to the second node, as element [53.8] requires. Therefore, Requester and Mr. Geier have failed to make a prima facie case of obviousness as to element [53.6]. (Psounis Dec. ¶ 82.)

Additionally, for all the same reasons noted above, the Office Action is incorrect.

[53.7] decompressing the compressed second feedback resulting in a decompressed second feedback

Claim element [53.7] requires that the first node decompress the compressed second feedback resulting in a decompressed second feedback. (Psounis Dec. ¶ 83.)

¹² Mr. Geier does not rely on McFarland for this element.

For at least the reasons identified for elements [53.5] and [53.6] above, Requester and Mr. Geier fail to provide sufficient evidence that the proposed Agee-Ton combination¹³ teaches this element or would have rendered it obvious in the context of claim 53. Specifically, Mr. Geier does not offer any evidence of decompressing any control information that characterizes receipt of a second signal, as elements [53.7] and [53.5] require. Nor does Mr. Geier offer any evidence that any such “decompressed second feedback” in his proposed combination is used to determine transmit power for subsequent transmissions to the third node, as element [53.9] requires. Moreover, Mr. Geier specifically offers no evidence in his combination of a *second* signal or a *second* feedback that are different from the first signal and first feedback, respectively, and transmitted from a different (“*third*”) node. (Psounis Dec. ¶ 84.)

Therefore, Requester and Mr. Geier have failed to make a prima facie case of obviousness as to element [53.7].

For the same reasons noted above, the Office Action is incorrect and has not established a prima facie case of obviousness with respect to claim 53 and this claim element.

[53.8] wherein the filtered transmission signal is a filtered first transmission signal that is transmitted to the second node using an 802.11-based orthogonal frequency-division multiplexing (OFDM) protocol via at least one antenna of a plurality of antennas, using a first power that is based on the decompressed first feedback; and further comprising

Claim element [53.8] requires that the filtered transmission signal to the second node (recited in element [53.2] above) is a filtered first transmission signal transmitted using an 802.11-based OFDM protocol via at least one antenna of a plurality of antennas, using a first power that is based on the decompressed first feedback. (Psounis Dec. ¶ 85.)

¹³ Mr. Geier does not rely on McFarland for this element. (See Ex. AA at 20-23.)

For the reasons set forth for elements [53.1]-[53.4] and [53.6] above, Requester and Mr. Geier fail to provide sufficient evidence that the combination of Agee, McFarland and Ton alone or in combination teach this claim element in the context of claim 53 or would have rendered it obvious. (Psounis Dec. ¶ 86.) At a minimum, they fail to show that the combination teaches a “decompressed first feedback.” Moreover, for at least the additional reasons below, Mr. Geier does not provide sufficient evidence that the proposed Agee-McFarland-Ton combination teaches or suggests this element.

First, Mr. Geier wrongly opines that the teaching of Locally-Enabled Network Optimization (LEGO) in Agee meets this element. (Ex. 1003, ¶96; Ex. AA at 25, citing Ex. 1008 at ¶ 499.) LEGO requires a very specific condition called channel reciprocity: the designer must calibrate the hardware at each node such that the channel from node 1 to 2 equals that from node 2 to 1. While the medium itself (such as the air) is the same in either direction, channel reciprocity within the hardware (such as the transmit and receive circuitry at each node) requires special calibration. Such calibration to achieve channel reciprocity is technically difficult and rarely used in practice in WiFi, due to the low cost of hardware components. However, the description of LEGO in Agee assumes that channel reciprocity is satisfied. (Ex. 1008 at ¶¶ 187-89.) Mr. Geier does not offer any evidence of channel reciprocity in his proposed Agee-McFarland-Ton combination. (Psounis Dec. ¶ 87.)

Moreover, Agee teaches a very specific method to compute transmit power using “receive and transmit weights employed by all nodes in the network during uplink and downlink operations”:

LEGO is enabled by exploiting substantive reciprocity of the internode channel responses, together with appropriate normalization of transmit power measures, to design uplink and downlink network quality metrics $D_{21}(W_2, G_1)$ and $D_{12}(W_1, G_2)$ that satisfy network reciprocity property:

$$D_{12}(W,G)=D_{21}(G^*,W^*) \quad (\text{EQ. 2})$$

where (W_2, G_1) and (W_1, G_2) represent the receive and transmit weights employed by all nodes in the network during uplink and downlink operations, respectively. If equation 1 holds, then equal network quality can be achieved in each link direction by setting $G_1=W_1^*$ and $G_2=W_2^*$, such that each node use the receive combiner weights as transmit distribution weights during subsequent transmission operations, i.e., the network is preferentially designed and constrained such that each link is substantially reciprocal, such that the ad hoc network capacity measure can be made equal in both link directions by setting at both ends of the link.

(Ex. 1008 at ¶ 188-89.) (Psounis Dec. ¶ 88.)

Mr. Geier does not provide any evidence that this method of computing transmit power using “weights” meet the claim requirement of using a “decompressed first feedback” to determine the transmit power for the transmission of the filtered transmission to the second node. (Psounis Dec. ¶ 89.)

Agee teaches implicit beamforming, where the base station relies on channel reciprocity rather than feedback from a receiving node to estimate the channel. The method of channel reciprocity described in Agee relies on channel calibration, not feedback. Therefore, the “weights” that Agee uses for adjusting transmit power are internally computed and not based on feedback received from a second node. (Psounis Dec. ¶ 89.)

As Mr. Geier recognizes, Agee explains that its nodes are capable of “*independently* adjust[ing] transmit power, for example, to optimize capacity achievable at that node given the total power [available] to it, or to minimize power emitted into the network by that node given an aggregate power requirement.” (Ex. 1008 ¶ 478; see Ex. AA at 26.) Indeed, “most of the quantities required for the optimization only require local information.” (Ex. 1008 ¶ 515.) Mr. Geier does not attempt to reconcile any of these teachings with the claim requirement that the transmit power is based on the decompressed first feedback, or otherwise explain how Agee teaches

computing transmit power based on feedback. Rather, Agee suggests that the transmit power is determined by the “aggregate power requirement,” not any specific type of feedback. (Ex. 1008 ¶ 478; see also ¶ 192 (“minimize the total transmit power in the entire network subject to a network quality constraint”).) Mr. Geier does not attempt to tie such “aggregate” or “total” power requirements to any feedback received by a node. (Psounis Dec. ¶ 89.)

Mr. Geier’s reliance on McFarland is similarly misplaced. (Psounis Dec. ¶ 90.) Mr. Geier cites the same portions of McFarland he previously cites for elements [53.2] and [53.3]. (*Compare* Ex. AA at 8 and 10 with 27.) Those paragraphs, reproduced below in full, explain that a base station autonomously instructs each node as to how much power to use:

In a third operational consideration in the invention, ***all signals transmitted from nodes 100-300 preferably arrive at the base station 400 with similar power levels.*** This is because a signal that is much too strong would swamp the ADCs in the base station 400, while a signal transmitted from one of nodes 100-300 that is much too weak would be lost in the noise from the other channels and not reliably received by the base station 400.

Similar to the above closed-loop control techniques, ***the system may use the base station 400 to send signals to nodes 100-300 which indicate whether each node 100-300 should transmit with more or less power.*** The system may alternatively implement open-loop control by having each node 100-300 ***adjust its power based on the power level it is receiving from the base station 400.***

It should be noted that the above difficulties do not typically occur when a single base station transmits to all other nodes simultaneously. Because all signals are emanating from the same source, it is easy to insure that frequency sub-channels do not overlap, that all signals have their symbol transitions at the same time, and that the power level of all sub-channels is the same as transmitted and therefore as received. However, ***it is possible for the base station to vary its allocation of transmit power amongst the various nodes to enhance efficiency.***

(Ex. 1009 at 8:8-32; Ex. AA at 27-28.)

To the extent Mr. Geier contends that the same portions of McFarland teach an “instruction” used to determine specific frequencies for subsequent transmissions as well as feedback used to determine the power of the transmitted signal, his theories fail because he does not separately identify an “instruction” and a “compressed feedback.” As set forth above, McFarland does not teach the “instruction” as claimed in element [53.1] and utilized in element [53.2]. (Psounis Dec. ¶¶ 90-91.)

Moreover, Mr. Geier previously fails to cite anything in McFarland as teaching the compressed or decompressed feedback of elements [53.4]-[53.7] and therefore cannot rely on McFarland for element [53.8]. But even if a POSITA would have considered McFarland in the overall combination, the portions that Mr. Geier cites are inapposite. Specifically, as shown above, McFarland teaches that ***the base station instructs nodes*** as to the optimal transmit power, ***not*** that the first node (here, the base station) determines its transmit power based on feedback received from a second node (here, “nodes 100-300”), as element [53.8] requires. In teaching only one-way instructions and feedback (i.e., from the base station to nodes 100-300), McFarland teaches away from element [53.8] altogether, because a POSITA would be steered away from arriving at the inventions claimed in the ’720 patent. (Psounis Dec. ¶ 92.)

This one-way feedback mechanism of McFarland is further exemplified by the following disclosures cited by Mr. Geier:

According to a fourth aspect of the invention, the sub-channels are shared between low data rate nodes and high data rate nodes as described above, and means are provided to ensure that signals from the various nodes arrive at the base station with similar power levels. This may be done by implementing ***a closed-loop power control scheme in which the strength of each signal is adjusted at the node according to feedback signals sent to it by the base station***, or by implementing an open-loop power control scheme in which the strength of each signal is adjusted at the node according to the power level of the base station signal it receives.

(Ex. 1009 at 3:28-38; Ex. AA at 28.) (Psounis Dec. ¶ 92.)

Therefore, all of the portions of Agee and McFarland that Mr. Geier relies on teach that nodes either adjust their transmit “independently” of any received feedback (as in Agee, see Ex. 1008 ¶ 478) or are instructed by the base station to adjust their transmit power via open or closed-loop feedback from the base station (as in McFarland, see Ex. 1009 at 8:8-32, 3:28-38). Mr. Geier does not identify any disclosures in the asserted references where the first node (such as an access point or base station) transmits to a second node using a transmit power based on feedback received from the second node. (Psounis Dec. ¶ 93.)

Therefore, Requester and Mr. Geier have failed to make a prima facie case of obviousness as to element [53.8].

For the same reasons noted above for this claim element and the other related claim elements of claim 53, the Office Action also fails to establish a prima facie case of obviousness.

[53.9] transmitting, using the 802.11-based OFDM protocol, a filtered second transmission signal, simultaneously with the filtered first transmission signal, to the third node using a second power that is based on the decompressed second feedback.

Claim element [53.9] requires transmitting, simultaneously with the filtered first transmission signal to the second node, a filtered second transmission signal to the third node using a second power that is based on the decompressed second feedback. (Psounis Dec. ¶ 94.)

For the reasons set forth for element [53.8] above, Requester and Mr. Geier fail to provide sufficient evidence that the combination of Agee, McFarland, and Ton teaches this element or would have rendered it obvious in the context of claim 53. At a minimum, they fail to show that the combination teaches transmitting a filtered transmission signal using a power that is based on a decompressed feedback. Specifically, for the reasons set forth in the preceding claim elements

of claim 53, Mr. Geier does not provide sufficient evidence that the proposed combination teaches this limitation in the context of claim 53. (Psounis Dec. ¶ 95.)

For this element, Mr. Geier relies on additional disclosures from Agee as purportedly teaching simultaneous MIMO transmissions. (See Ex. 1003, ¶98; Ex. AA at 28-29.) However, these disclosures do not remedy the deficiencies identified above. (Psounis Dec. ¶ 96.) For example, Agee teaches that “a subset of its nodes are MIMO-capable nodes, and that each such node can simultaneously communicate with up to as many nodes in its field of view as it has antennae.” (Ex. 1008 ¶ 177.) But the mere ability of the first node to simultaneously communicate with multiple nodes says nothing about whether the first node transmits to each such node *using a power that is based on a decompressed feedback from each respective node*. Mr. Geier does not provide any evidence of this aspect of element [53.9] in Agee or his proposed combination. (Psounis Dec. ¶ 96.)

Rather, Mr. Geier’s reliance on “Locally-Enabled Network Optimization (LEGO) to manage the transmit power for each node (BS and SU) operating, dynamically,” (Ex. AA at 30, citing Ex. 1008 ¶ 499), undermines his obviousness theory. As described above in connection with element [53.8], Mr. Geier does not provide any evidence that Agee’s method of computing transmit power for LEGO using “weights” meets the claim requirement of transmitting a filtered second transmission signal simultaneously with the transmission of the filtered first transmission signal using a second power that is based on the “decompressed second feedback.” Indeed, as Mr. Geier again recognizes, Agee explains that its nodes are capable of “*independently* adjust[ing] transmit power, for example, to optimize capacity achievable at that node given the total power [available] to it, or to minimize power emitted into the network by that node given an aggregate power requirement.” (Ex. 1008 ¶ 478; see Ex. AA at 31.) (Psounis Dec. ¶ 97.)

Mr. Geier does not rely on any additional portions of McFarland for this element beyond what he previously relies on for element [53.8]. As set forth there, McFarland does not teach or suggest this element alone or in combination with Agee and/or Ton.

Therefore, Requester and Mr. Geier have failed to make a prima facie case of obviousness as to element [53.9].

For the same reasons noted above for this claim element and the other related claim elements of claim 53, the Office Action also fails to establish a prima facie case of obviousness.

Claims 54-56, 64-66, 70, 76, 81-84 and 87-94

Claims 54-56, 64-66, 70, 76, 81-84 and 87-94 all depend on claim 53 and thus are patentable over the proposed combination for the same reasons discussed above with respect to claim 53. (Psounis Dec. ¶ 98.)

No Motivation to Combine

As discussed above, the proposed combination of Agee, McFarland and Ton fails to disclose or render obvious the method claimed in claim 53. In addition, the proposed combination is based on improper hindsight and is legally and factually erroneous.

A. Mr. Geier's Purported Rationale for Combining the References Is Insufficient as a Matter of Law

Requester's and its expert, Mr. Geier's, arguments concerning the purported motivations to combine the asserted references fail as a matter of law. For starters, they argue numerous times that based on Agee, a POSITA "*could have*" looked to other references such as McFarland and Ton for additional teachings. But the Federal Circuit has expressly rejected that rationale and held that a motivation to combine requires more than the mere fact that a POSITA "could have" combined references, stating "obviousness concerns whether a skilled artisan *not only could have made but would have been motivated* to make the combinations or modifications of prior art to

arrive at the claimed invention.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphasis added). This fatal flaw affects the entire request for reexamination, as evidenced by the numerous, repeated arguments made by requester, which are reproduced below in relevant part:

“A POSITA would have been motivated to make such a combination because the disclosure of restricting the channels or frequencies of transmissions in Agee could have caused them to look to McFarland for how to better operate a system that utilizes feedback across nodes in a network to instruct the adjustment of channels or frequencies of transmissions accordingly.” (Request at 13 (citing Ex. 1003, ¶50) (emphasis added)).

“A POSITA would have been motivated to make such a combination because the disclosure of restricting the channels or frequencies of transmissions in Agee could have caused them to look to McFarland for how to implement filtering of the signals to remove power from the frequencies to be avoided.” (Request at 14 (citing Ex. 1003, ¶ 56) (emphasis added)).

“A POSITA would have been motivated to make such a combination because the disclosure of using a band pass filter to filter transmission signals in Agee could have caused them to look to McFarland for how to better operate a system that utilizes feedback across nodes in a network to instruct the band pass filtering in Agee accordingly.” (Request at 14-15 (citing Ex. 1003, ¶57)(emphasis added)).

“A POSITA would have been motivated to make such a combination because the disclosure of the desire to minimize capacity and power of the network-so to minimize interference-in Agee could have caused them to look to Ton for how to implement compression and decompression of signals.” (Request at 16 (citing Ex. 1003, ¶62) (emphasis added)).

“A POSITA would have been motivated to make such a combination because the disclosure of reducing strain and increasing efficiency in the network through control and feedback mechanisms in Agee could have caused them to look to Ton for how to more efficiently operate a wireless communication network.” (Request at 16 (citing Ex. 1003, ¶ 63) (emphasis added)).

“POSITA would have been motivated to make such a combination because the disclosure of OFDM in Agee could have caused them to look to McFarland for a standard, well-known protocol (i.e., IEEE 802.11).” (Request at 17 (citing Ex. 1003, ¶68) (emphasis added)).

“A POSITA would have been motivated to make such a combination because the disclosure of using OFDM in Agee could have caused them to look to McFarland

for a well-known standard for OFDM in wireless communication networks (i.e., IEEE 802.11).” (Request at 17 (citing Ex. 1003, ¶69) (emphasis added)).

Requester’s expert, Mr. Geier, also relies on the same legally deficient rationale as demonstrated by the statements reproduced below:

“In my opinion, a POSITA would have been motivated to make such a combination because the disclosure of restricting the channels or frequencies of transmissions in Agee could have caused them to look to McFarland for how to better operate a system that utilizes feedback across nodes in a network to instruct the adjustment of channels or frequencies of transmissions accordingly.” (Ex. 1003 at ¶51) (emphasis added).

“In my opinion a POSITA would have been motivated to make such a combination because the disclosure of restricting the channels or frequencies of transmissions in Agee could have caused them to look to McFarland for how to implement filtering of the signals to remove power from the frequencies to be avoided.” (Ex. 1003, ¶56)(emphasis added)).

“It is my opinion that a POSITA would have been motivated to make such a combination because the disclosure of using a band pass filter to filter transmission signals in Agee could have caused them to look to McFarland for how to better operate a system that utilizes feedback across nodes in a network to instruct the band pass filtering in Agee accordingly.” (Ex. 1003, ¶57) (emphasis added)).

“In my opinion, a POSITA would have been motivated to make such a combination because the disclosure of the desire to minimize capacity and power of the network-so to minimize interference-in Agee could have caused them to look to Ton for how to implement compression and decompression of signals.” (Ex. 1003, ¶62 (emphasis added)).

“It is my opinion that a POSITA would have been motivated to make such a combination because the disclosure of reducing strain and increasing efficiency in the network through control and feedback mechanisms in Agee could have caused them to look to Ton for how to more efficiently operate a wireless communication network.” (Ex. 1003, ¶63 (emphasis added)).

“In my opinion, a POSITA would have been motivated to make such a combination because the disclosure of OFDM in Agee could have caused them to look to McFarland for a standard, well-known protocol (i.e., IEEE 802.11).” (Ex. 1003, ¶68 (emphasis added)).

“It is my opinion that a POSITA would have been motivated to make such a combination because the disclosure of using OFDM in Agee could have caused them to look to McFarland for a well-known standard for OFDM in wireless communication networks (i.e., IEEE 802.11).” (Ex. 1003, ¶69 (emphasis added)).

This is precisely the type of rationale that the Federal Circuit has repeatedly rejected. In *PersonalWeb*, the Federal Circuit held:

The Board's reasoning is also deficient in its finding that a relevant skilled artisan would have had a motivation to combine Woodhill and Stefik in the way claimed in the '310 patent claims at issue and would have had a reasonable expectation of success in doing so. The Board's most substantial discussion of this issue merely agrees with Apple's contention that "a person of ordinary skill in the art reading Woodhill and Stefik would have understood that the combination of Woodhill and Stefik would have allowed for the selective access features of Stefik to be used with Woodhill's content-dependent identifiers feature." ***But that reasoning seems to say no more than that a skilled artisan, once presented with the two references, would have understood that they could be combined. And that is not enough: it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention.***

PersonalWeb Techs., LLC v. Apple, Inc., 848 F.3d 987, 993-94 (Fed. Cir. 2017) (emphasis added).

Likewise, in *NPF Ltd. v. Smart Parts, Inc.*, the Federal Circuit rejected precisely this type of expert testimony, finding it "irrelevant to the motivation to combine analysis":

NPF provides several arguments as to why Smart Parts did not prove a motivation to combine. First, NPF argues that Smart Parts' expert did not provide any [*979] evidence on this issue. Smart Parts' expert stated: "It's my opinion that by the end of 1997 certainly microcontrollers could have been designed into paintball guns or were described in paintball gun prior art references. Also microprocessors that could have been designed into paintball guns could be reprogrammed either remotely or externally to update their program instructions." (J.A. 541.) ***We agree with NPF that such testimony is irrelevant to the motivation to combine analysis. What "could have been" merely employs hindsight to determine whether the claimed invention was technically feasible at the time of the invention. Such testimony does not address the central question in the motivation to combine inquiry—"whether a person of ordinary skill in the art . . . would have been led to make the combination recited in the claims."*** Merely knowing, years later, that someone could have successfully made the combination does not aid in determining whether at the time of the invention, one of skill in the art would have been motivated to do so. NPF is therefore correct that Smart Parts' expert did not provide the requisite evidence of motivation to combine.

NPF Ltd. v. Smart Parts, Inc., 187 F. App'x 973, 978-79 (Fed. Cir. 2006) (quoting *Kahn*, 441 F.3d at 988) (emphasis added).

The Federal Circuit also rejected Requestor's rationale in a recent opinion in *Virtek Vision*, where it held:

We conclude that the Board erred as a matter of law with regard to the motivation to combine. It does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements such as an angular direction system using a single camera and a 3D coordinate system using two cameras were both known in the art. Briggs discloses a laser projector system with different embodiments of laser tracker systems—one that uses two cameras to determine the 3D coordinates of a target, and another that uses one camera to determine angular measurements of a target, Briggs discloses these two measurement options "may be applied to any computer controlled aiming system." These disclosures, however, do not provide any reason why a skilled artisan would use 3D coordinates instead of angular directions in a system. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("[O]bviousness concerns whether a skilled artisan not only could have made but would have been motivated to make the combinations or modifications of prior art to arrive at the claimed invention.").

The mere fact that these possible arrangements existed in the prior art does not provide a reason that a skilled artisan would have substituted the one-camera angular direction system in Keitler and Bridges with the two-camera 3D coordinate system disclosed in Briggs. There was no argument in the petition regarding why a skilled artisan would make this substitution—other than that the two different coordinate systems were "known to be used." The petition does not argue Briggs articulates any reason to substitute one for another or any advantages that would flow from doing so. Nor does Dr. Mohazzab, Aligned Vision's expert, articulate any reason why a skilled artisan would combine these references. In his declaration, he testified "it would have been obvious" to use the 3D coordinates instead of angular measurements because "both such measurement systems were known."

Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc., 97 F.4th 882, 886-87 (Fed. Cir. 2024) (internal citations omitted) (emphasis added).

Indeed, the Federal Circuit has consistently held that arguments such as those made by Requester and Mr. Geier, and adopted by the Office Action, are insufficient to establish the requisite motivation to combine necessary for a finding of obviousness. *See, e.g., InTouch Techs., Inc. v. VGo Communs., Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) ("Go's expert also succumbed to hindsight bias in her obviousness analysis. Dr. Yanco's testimony primarily consisted of

conclusory references to her belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so.”); *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (“[T]he expert's testimony on obviousness was essentially a conclusory statement that a person of ordinary skill in the art would have known, based on the 'modular' nature of the claimed components, how to combine any of a number of references to achieve the claimed inventions. This is not sufficient and is fraught with hindsight bias.”); *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (“This passage of Stopler provides no express discussion of, nor any connection to, the PAR of a multicarrier transmitter. Instead, Stopler explains that the phase scrambling sequence is applied in order to randomize the overhead channel symbols, and is only applied to the other symbols in order to simplify implementation. Dr. Tellado fails to identify any other evidence that provides this necessary link. Dr. Tellado instead offers only unsupported and conclusory statements asserting that an ordinarily skilled artisan at the time of the invention would have been motivated to apply the randomization disclosed in Stopler as a means to reduce PAR in Shively . . . Dr. Tellado's *ipse dixit* declaration fails to provide any meaningful explanation for why one of ordinary skill in the art would be motivated to combine these references **at the time of this invention**. It also fails to explain why a person of ordinary skill in the art would have combined elements from specific references **in the way the claimed invention does.**”)(internal quotations and citations omitted)(emphasis in original).

The Patent Office has rejected the same arguments as well, including in two informative opinions. First, in *Johns Manville v. Knaufl*, the Board held that “[o]bviousness, however, requires ‘a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.’” IPR2018-00827, Paper 10 at 13 (PTAB

Oct. 16, 2018) (informative) (quoting *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)). The Board emphasized that “[d]emonstrating that a reference is analogous art or relevant to the field of endeavor of the challenged patent is not sufficient to establish that one of ordinary skill would have had reason to combine its teachings with other prior art in the manner set forth in the claim” “and “[m]ere compatibility of the references is likewise not sufficient.” *Id.* at 10, 17. Likewise, in *Hulu LLC v. Sound View Innovations, LLC*, the Board again rejected a similar argument concerning a purported motivation to combine, stating “[w]e are also mindful that ‘obviousness concerns whether a skilled artisan not only ***could have made*** but ***would have been motivated to make*** the combinations or modifications of prior art to arrive at the claimed invention.’” IPR2018-00582, Paper 34 at 21 (PTAB Aug. 5, 2019) (quoting *Belden*, 805 F.3d at 1073)(informative); *see also id.* at 22 (“Just as in *Belden*, the fact that the combination might have been successful does not mean that an ordinarily skilled artisan would have been motivated to make the combination.”). Moreover, in rejecting the petitioner’s motivation to combine rationale, the Board found the lack of any purported benefit in the proposed combination to be a significant, if not dispositive, factor, stating “***it is unclear why an ordinarily skilled artisan would have taken that path when there is no perceptible benefit*** from using main memory in the first place, as discussed above.” *Id.* at 21(emphasis added).

The Board’s holding in *Hulu* is directly applicable in this proceeding, where Requester and its expert ***admit*** that proposed combinations “***would not have affected how the method of Agee would have operated.***” (Request at 15 (citing Ex. 1003, ¶58) (emphasis added); *id.* at 16 (citing Ex. 1003, ¶64), 17 (citing Ex. 1003, ¶70); *see also* Ex. 1003, ¶¶52, 58, 64, 70)). Their admission that the combinations do not affect Agee’s method of operation demonstrates that their purported rationales for combining the asserted references is based on pure hindsight.

B. The Office Action Has Not Articulated a Sufficient Motivation to Combine

With respect to claim 53, the Office Action has not articulated a sufficient motivation to combine as it relies on Mr. Geier's flawed declaration. In addition, the Office Action's purported motivations to combine are insufficient for additional reasons. For example, regarding claim limitation 53[1], the Office Action states:

McFarland discloses an analogous wireless adaptive communication system (see Abstract) in which a node may adjust the frequency used by that node (see column 7, lines 37-40 and column 3, lines 7-14) based upon feedback from a base station (see column 4, lines 34-50), which leads to the node sending requests to the base station for channel reallocation, see column 5, lines 40-57). *One skilled in the art would recognize that this implementation because this would allow for more efficiency by allowing nodes to manage frequencies by simply sending instructions (see James T. Grier Declaration at 50).*

(OA at 5-6 (emphasis added).) Respectfully, it is not clear what rationale is being relied on as the purported motivation to combine the disclosures of McFarland and Agee, nor what the Office Action is relying on as the claimed instruction (e.g., is it McFarland's reference to "allowing the base station 400 to feed back information to the node", "requests to the base station 400 to change or reallocate channels," the "appropriate command," or something else?).

Additionally, as noted above, a POSITA would not have been motivated to combine the teachings of Agee and McFarland. (Psounis Dec., ¶62.) Agee and McFarland are directed to different problems and Agee already addresses the issue of interference such that a POSITA would not have looked to McFarland for any improvement as suggested in the Office Action and by Mr. Geier. (Psounis Dec., ¶62.) Indeed, Agee discloses that the issue of interference is already addressed via the diversity channels which gain the benefits of orthogonality. (*Id.*) In contrast, McFarland discloses a number of methods to have low rate nodes pick certain sub channels to transmit while higher rate nodes use the rest of the sub channels simultaneously, and ensures no interference by having sub channels which do not overlap. In other words, not only the two patents

solve different problems, but also the problem of no interference between simultaneous transmissions is already addressed by Agee with the “orthogonality” of the spatially separated diversity based channels. (Psounis Dec., ¶¶62; Ex. 1008 ¶ 176.)

Similarly, the Office Action’s assertion that a POSITA would have been motivated to modify Agee and McFarland by using data compression and decompression per Ton to reduce the amount of bandwidth and power needed for transmitting does not account for the references other teachings that would discourage a POSITA from pursuing the proposed combination. (Psounis Dec., ¶¶74-79) As Ton discloses:

Implementation of a data compression scheme, however, uses extensive processing resources. If the data compression does not work, then resources are essentially being wasted. For example, when the bit error rate in a wireless telecommunication network increases, it is likely that transmitted data will not be decompressed correctly on the receiving end of the air interface. In such a situation, the decompressor typically detects that the received packets cannot be properly decompressed and requests that the data be resent. In addition, the decompressor begins discarding received packets until the decompressor is able to resynchronize with the compression scheme. In the meantime, however, the compressor makes inefficient use of processing resources and bandwidth by trying to compress the data packets and send them over the air interface link, even though the data packets are simply being discarded by the decompressor.

(Ex. 1010 at 2:38-53.) To address these concerns, and in doing so validating their legitimacy, Ton discloses that the compressor is disabled for a certain amount of time whenever the link quality falls below a certain threshold. (Ex. 1010 at 2:54-64; Psounis Dec., ¶¶74-79.) However, Agee includes repeated statements regarding the desire to minimize complexity and power consumption and reduce overhead and costs associated with its network system, and to conserve power. (*E.g.*, Ex. 1008, ¶¶15, 20, 48, 69, 96, 99, 249-252, 257, 264, 523.) Agee also discloses concerns about costs associated with additional hardware requirements for example, as illustrated in paragraph 237:

The approaches currently described in the field, . . . require additional hardware at each node comprising one end of a channel per diversity path to exploit that diversity path. This creates a geometric growth in the hardware complexity for each particular node, and a linear growth in cost for each diverse path exploited by a given network, that rapidly renders any network attempting to exploit such diversity uneconomic. Moreover, such an approach 'muddies its own stream' in that it reduces the capacity increase by the power increase needed to power the more complex transceiver. Exploitation of this multipath approach requires both high power (to permit data transport over the relatively weaker additional diversity path) and complex codecs (to permit data transports at high rates on the dominant path by filtering out the diversity path transmissions).

(Ex. 1008, ¶237.) A POSITA would have recognized the same concern with respect to requiring compression and decompression solutions at each node based on the teachings of Ton and Agee as well as McFarland. (Psounis Dec., ¶¶74-79.)

These concerns are further exacerbated by the fact that Ton's compression and decompression solution does not function below a certain threshold link quality, (Ex. 1010 at 2:54-64), and thus may not function in a host of network environments contemplated by Agee, or with the a variety of simple node types contemplated by McFarland in comparison to the "new wireless data communication systems" contemplated in Ton, (Ex. 1010 at 2:34-36.) (Psounis Dec. ¶ 77.) Ton also readily acknowledges that "In the wireless context, however, the use of compression introduces a number of problems. First, *compression schemes require high processing power*, while it is typically desirable to reduce the amount of resources used in a wireless telecommunications system. For example, mobile stations generally have a limited power supply, and it is therefore beneficial to reduce the amount of power used by the processor in the mobile station." (Ex. 1010, 1:22-30.) This is directly contrary to the Office Action's assertion that modifying Agee with Ton's teachings regarding compression and decompression would have resulted in power savings. Ton also discloses:

Wireless networks, on the other hand, often have a higher and much more variable bit error rate caused by the combination of mobile station mobility and the use of an air interface as a transmission medium. As a result, when the wireless quality deteriorates (i.e., a high bit error rate exists), some data packets may be lost, thereby causing decompression on the receiving end to fail to regenerate the 40 packet data. Such a situation causes an *inefficient use of processing power* because data packets are being compressed on the transmitting end, even though the data packets cannot be regenerated.

(Ex. 1010 at 1:33-43.) In view of these disclosures, and that the proposed modification to Agee is directed to feedback signals rather than data, a POSITA would not have had a motivation to combine the references as proposed by Requester or the Examiner, nor would they have had a reasonable expectation of success either. (Psounis Dec., ¶¶74-79.)

Conclusion

Pursuant to 37 C.F.R. 1.550(f), the attached Certificate of Service indicates that copies of this Response to Office Action have been served in their entirety on the third party requester by first class mail at the address of record for the third party requester, in accordance with 37 C.F.R. 1.248.

The Commissioner is hereby authorized to charge any deficiency of fees submitted herewith, or credit any overpayment, to Deposit Account No. 601918. If the Examiner believes that a phone interview would be helpful, the Examiner is kindly requested to contact Patent Owner's undersigned attorney.

Date: June 2, 2025

Respectfully submitted,

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LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims:

1. A method for managing interference in a radio communications network, comprising the steps of:
 - receiving an aggregated radio signal at a first node in the radio communications network on a plurality of frequencies;
 - determining a power level for the aggregated radio signal for each frequency in the plurality frequencies;
 - subtracting the power level for each the frequency from a power limit to produce a power differential for the each frequency; and
 - instructing a second node in the radio communications network to avoid using a transmission frequency corresponding to a non-positive power differential in the plurality of power differentials to transmit to the first node.
2. The method of claim 1, further comprising the steps of: receiving a transmission from the second node in the radio communications network; and discarding any portion of the transmission carried on the transmission frequency.
3. The method of claim 2, wherein the discarding step comprises applying a filter to the transmission.
4. The method of claim 1, wherein the step of determining a power level is carried out by:
 - acquiring a plurality of instantaneous power level measurements for each the frequency;
 - and
 - calculating an average power level based on the plurality of instantaneous power level measurements.
5. The method of claim 1, wherein the step of determining a power level is carried out by:

acquiring a plurality of instantaneous power level measurements for the each frequency;
and

calculating a median power level based on the plurality of instantaneous power level measurements.

6. The method of claim 1, further comprising the step of: sending to the second node a request to adjust a transmission power level on a frequency corresponding to a positive power differential in the plurality of power differentials.

7. The method of claim 1, further comprising the step of: instructing a plurality of other nodes in the radio communications network to avoid using the transmission frequency to transmit information to the first node.

8. The method of claim 7, further comprising the steps of:
receiving a transmission from one of the plurality of other nodes; and
discarding any portion of the second transmission carried on a frequency corresponding to a non-positive power differential in the plurality of power differentials.

9. The method of claim 8, further comprising the step of: sending to the one of the plurality of other nodes a request to adjust a transmit power level on a frequency corresponding to a positive power differential in the plurality of power differentials.

10. The method of claim 1, further comprising the steps of:
determining an updated power level for the aggregated radio signal for each frequency in the plurality frequencies;
subtracting the updated power level for each the frequency from the power limit to produce a plurality of updated power differentials; and
instructing the second node to avoid transmitting to the first node on a frequency corresponding to a non-positive updated power differential in the plurality of updated power differentials.

11. The method of claim 1, further comprising the steps of:

generating an optimal waveform profile based on the plurality of power differentials; and reporting the optimal waveform profile to the second node.

12. The method of claim 11, wherein the reporting step is carried out using a common network configuration channel.

13. The method of claim 11, further comprising the step of compressing the optimal waveform profile prior to performing the reporting step.

14. The method of claim 11, wherein the optimal waveform profile specifies a waveform pattern.

15. The method of claim 14, wherein the waveform pattern defines a transmission signal having a power spectral density that varies over time.

16. The method of claim 14, further comprising the steps of:
generating a second optimal waveform profile based on the plurality of power differentials; and
reporting the second optimal waveform profile to a third node in the radio communications network; wherein the second optimal waveform profile specifies a second waveform pattern that is orthogonal to the waveform pattern.

17. The method of claim 1, wherein the plurality of frequencies comprises all of the frequencies in a radio frequency band.

18. The method of claim 1, further comprising the steps of: associating a unique pattern with the second node; and determining whether the transmission contains the unique pattern.

19. A method for managing interference in a radio communications network, comprising the steps of:

receiving at a first node in the radio communications network an instruction transmitted from a second node in the radio communications network to avoid using a plurality of frequencies to transmit to the second node;

filtering a transmission signal to remove power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

transmitting the filtered transmission signal to the second node;

separately from the receipt of the instruction, receiving a compressed first feedback from the second node that is based on a received power and one or more frequencies of a first signal transmitted from the first node to the second node;

separately from the receipt of the instruction, receiving a compressed second feedback from a third node that is based on a received power and one or more frequencies of a second signal transmitted from the first node to the third node;

decompressing the compressed first feedback resulting in a decompressed first feedback;

decompressing the compressed second feedback resulting in a decompressed second feedback;

generating one or more data structures based on the decompressed first feedback and the decompressed second feedback;

wherein the filtered transmission signal is a filtered first transmission signal that is transmitted using a first frequency and an 802.11-based orthogonal frequency-division multiplexing (OFDM) protocol via at least one antenna of a plurality of antennas, using a first power that is based on at least one of the one or more data structures; and further comprising:

transmitting, using a second frequency and the 802.11-based OFDM protocol, a filtered second transmission signal, simultaneously with the filtered first transmission signal, to the third node, using a second power that is based on at least one of the one or more data structures.

20. A method for managing interference in a radio communications network, comprising the steps of:

receiving at a first node in the radio communications network an instruction transmitted from a second node in the radio communications network to avoid using a plurality of frequencies to transmit to the second node;

filtering a transmission signal to remove power from the transmission signal at each frequency in the plurality of frequencies to be avoided;
transmitting the filtered transmission signal to the second node;
receiving an optimal waveform profile from the second node, the optimal waveform profile being based on a plurality of power measurements for the plurality of frequencies and a power limit; and
conforming the transmission signal to the optimal waveform profile prior to performing the transmitting step.

21. The method of claim 20, further comprising the step of decompressing the optimal waveform profile prior to performing the conforming step.

22. The method of claim 19, wherein the instruction includes a first instruction, and further comprising:

receiving at the first node in the radio communications network a second instruction transmitted from the third node to avoid using a different plurality of frequencies to transmit to the third node; and

filtering a second transmission signal to remove power from the second transmission signal at each frequency in the different plurality of frequencies to be avoided, resulting in the filtered second transmission signal.

23. The method of claim 19, wherein the first power and the second power are the same.

24. The method of claim 19, wherein the first power and the second power are different.

25. The method of claim 19, wherein an update of the compressed first feedback is repeatedly received at time periods of less than one second, and the first power is repeatedly updated based on an updated decompressed first feedback at time periods of less than one second; and an update of the compressed second feedback is repeatedly received at time periods of less than one second, and the second power is repeatedly updated based on an updated decompressed second feedback at time periods of less than one second.

26. The method of claim 19, wherein the filtered first transmission signal and the filtered second transmission signal are transmitted via the same transceiver.
27. The method of claim 19, wherein the filtered first transmission signal and the filtered second transmission signal are transmitted via different transceivers.
28. The method of claim 19, wherein the instruction is received utilizing a dedicated channel.
29. The method of claim 19, wherein the instruction is received via an antenna configured for omnidirectional communication.
30. The method of claim 19, wherein the compressed first feedback and the compressed second feedback are received utilizing a dedicated channel.
31. The method of claim 19, wherein the compressed first feedback and the compressed second feedback are received via an antenna configured for omnidirectional communication.
32. The method of claim 19, wherein the decompressed first feedback and the decompressed second feedback are used to increase spatial separation among transmissions.
33. The method of claim 19, wherein the decompressed first feedback and the decompressed second feedback are used to increase spatial separation among transmissions at the same frequency.
34. The method of claim 19, and further comprising:
receiving a compressed third feedback from a fourth node that characterizes receipt of a third signal sent from the first node to the fourth node, the fourth node being a legacy node;
decompressing the compressed third feedback resulting in a decompressed third feedback;
transmitting, using a third frequency and another 802.11-based OFDM protocol, the third transmission signal to the fourth node using a transceiver separate from one or more other

transceivers used to transmit the filtered first transmission signal and the filtered second transmission signal, and further using a third power that is based on the decompressed third feedback.

35. The method of claim 34, wherein the third transmission signal is transmitted simultaneously with the filtered first transmission signal and the filtered second transmission signal via at least one different antenna of the plurality of antennas.

36. The method of claim 19, wherein the compressed first feedback is based on a received power at a plurality of frequencies via which the first signal is received.

37. The method of claim 19, wherein the instruction is received prior to the receipt of the compressed first feedback.

38. The method of claim 19, wherein the filtered second transmission signal is transmitted simultaneously with the filtered first transmission signal via the same plurality of antennas.

39. The method of claim 19, wherein the first frequency is selected as a function of the compressed first feedback, and the second frequency is selected as a function of the compressed second feedback.

40. The method of claim 19, wherein the instruction includes a 802.11 clear to send (CTS) instruction.

41. The method of claim 19, wherein the instruction includes a 802.11 request to send (RTS) instruction.

42. The method of claim 19, wherein the filtered second transmission signal is transmitted simultaneously with the filtered first transmission signal via at least one different antenna of the plurality of antennas.

43. The method of claim 19, wherein the filtered second transmission signal is transmitted simultaneously with the filtered first transmission signal using the at least one antenna of the plurality of antennas.

44. The method of claim 19, wherein at least one of:

the first signal includes a data signal; the first signal includes an aggregate signal;

the compressed first feedback is configured to ensure that transmissions from all neighbors of the first node are received at a same power level;

the compressed first feedback is configured to at least one of: minimize a transmit power on reliable links, maximize an ability to achieve spatial separation among transmissions on a same frequency, minimize network self-interference, improve low probability of intercept (LPI), or lower probability of detection (LPD);

the compressed first feedback and the compressed second feedback are received simultaneously;

at least one of the compressed first feedback or the compressed second feedback is received separately from the receipt of the instruction, by being received before the instruction is received;

at least one of the compressed first feedback or the compressed second feedback is received separately from the receipt of the instruction, by being received after the instruction is received;

the one or more frequencies of the first signal includes a frequency band;

the one or more frequencies of the second signal includes a frequency band;

the one or more frequencies of the first signal includes a first frequency band, and the one or more frequencies of the second signal includes a second frequency band;

a single data structure is generated based on the decompressed first feedback and the decompressed second feedback;

a first data structure is generated based on the decompressed first feedback, and a second data structure is generated based on the decompressed second feedback;

a first data structure is generated based on the decompressed first feedback, where the first power is based on the first data structure, and a second data structure is generated based on

the decompressed second feedback, where the second power is based on the second data structure;

the first power and the second power differ in terms of power level;

the steps are performed in the order listed;

the radio communications network includes an 802.11 network;

the radio communications network includes an 802.11a network; the radio communications network includes an 802.11g network;

the at least one antenna includes multiple antennas;

the at least one antenna includes at least one omnidirectional antenna;

the at least one antenna includes at least one directional antenna;

the first frequency includes a first frequency band;

the second frequency includes a second frequency band;

the first frequency is part of a first frequency band;

the second frequency is part of a second frequency band;

the first frequency includes a first frequency band, and the second frequency includes a second frequency band, where the first frequency band and the second frequency band do not overlap;

interference in the radio communications network is managed;

the first node is a mobile node and the second node is a non-mobile node;

the second node is a mobile node and the first node is a non-mobile node; the instruction sets forth the plurality of frequencies to avoid using;

the instruction specifies the plurality of frequencies to avoid using;

a purpose of the instruction is to avoid using the plurality of frequencies;

a purpose of the instruction is to avoid using the plurality of frequencies, where the purpose is accomplished by specifying the plurality of frequencies to avoid using;

a purpose of the instruction is to avoid using the plurality of frequencies, where the purpose is accomplished by specifying one or more frequencies to use;

a purpose of the instruction is to avoid using the plurality of frequencies, where the purpose is accomplished by specifying one or more frequencies to use, the one or more frequencies not including the plurality of frequencies;

the instruction to avoid the plurality of frequencies sets forth one or more frequencies to use;

the instruction to avoid the plurality of frequencies specifies one or more frequencies to use;

the instruction to avoid the plurality of frequencies assigns one or more frequencies to use;

the instruction to avoid the plurality of frequencies does not specify the plurality of frequencies;

the instruction to avoid the plurality of frequencies sets forth one or more frequencies to use, thereby resulting in the avoidance of using the plurality of frequencies;

a purpose of the filtering is to remove the power from the transmission signal at each frequency in the plurality of frequencies to be avoided, where the purpose is accomplished by specifying one or more frequencies to which the power is to be applied;

a purpose of the filtering is to remove the power from the transmission signal at each frequency in the plurality of frequencies to be avoided, where the purpose is accomplished by specifying the plurality of frequencies to be avoided;

the filtering suppresses or otherwise minimizes waves or oscillations at each frequency in the plurality of frequencies to be avoided;

the filtering suppresses or otherwise minimizes waves or oscillations at each frequency in the plurality of frequencies to be avoided, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the filtering removes all power from the transmission signal;

the filtering removes some power from the transmission signal;

the filtering discards one or more portions of the transmission signal at each of the plurality of frequencies;

the filtering utilizes transmit excision;

the filtering utilizes compression;

the filtering identifies certain one or more frequencies in connection with which power is applied, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by an adjustment in relation to power previously used in connection with the transmission signal;

the removal of power from the transmission signal at each frequency in the plurality of frequencies is accomplished by adjusting a processing of the transmission signal so that power that was previously used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided, is no longer used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by setting a waveform profile that results in no power being applied in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by pre-processing the transmission signal, before any power is applied, so that power, which would otherwise be applied in connection with the transmission signal at each frequency in the plurality of frequencies, is not applied in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by pre-processing the transmission signal, before any power is applied, so that no power is applied in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the transmission signal is generated so as to not include power at each frequency in the plurality of frequencies to be avoided;

the transmission signal is generated so as to not include power at each frequency in the plurality of frequencies to be avoided, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the transmission signal is pre-processed so as to not include power at each frequency in the plurality of frequencies to be avoided, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the filtering is performed using an output filter;

the filtering is performed using an optimal matched filter;
the filtering is performed using a band selection filter; the filtering is performed using a median filter; or
the filtering is performed using a nonlinear filter.

45. The method of claim 19, wherein the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by adjusting a processing of the transmission signal so that certain power that was previously used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided before the instruction is received, is no longer used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided in accordance with the instruction.

46. The method of claim 19, wherein the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by adjusting a processing of the transmission signal so that certain power that was previously used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided before the instruction is received, is no longer used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided in accordance with the instruction, which specifies at least one frequency to use so as to avoid using the plurality of frequencies to be avoided in order to transmit to the second node.

47. The method of claim 19, wherein network forwarding decisions are guided using instantaneous information from a media access control (MAC) layer.

48. The method of claim 47, wherein the network forwarding decisions are guided to eliminate a dominant end-to-end latency effect of channel access delay at at least one hop.

49. The method of claim 19, wherein frequency channels are reused in order to increase spatial reuse across multiple basic service sets.

50. The method of claim 19, wherein RTS/CTS signaling is extended such that frequency channels are reused in order to increase spatial reuse across multiple basic service sets.

51. The method of claim 19, wherein RTS/CTS signaling is extended such that frequency channels are reused in order to increase spatial reuse across multiple basic service sets, to accommodate legacy access points.

52. A method for managing interference in a radio communications network, comprising the steps of:

- receiving at a first node in the radio communications network an instruction transmitted from a second node in the radio communications network to avoid using a plurality of frequencies to transmit to the second node;

- filtering a transmission signal to remove power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

- transmitting the filtered transmission signal to the second node;

- wherein the instruction includes a first instruction and the filtered transmission signal includes a filtered first transmission signal that is transmitted to the second node using a first power via an 802.11-based orthogonal frequency-division multiplexing (OFDM) protocol, and further comprising:

- receiving at the first node in the radio communications network a second instruction transmitted from a third node in the radio communications network to avoid using a different plurality of frequencies to transmit to the third node;

- filtering a second transmission signal to remove power from the second transmission signal at each frequency in the different plurality of frequencies to be avoided; and

- transmitting, using a second power via the 802.11-based OFDM protocol and simultaneously with the filtered first transmission signal, the filtered second transmission signal to the third node.

53. A method for managing interference in a radio communications network, comprising the steps of:

receiving at a first node in the radio communications network an instruction transmitted from a second node in the radio communications network to avoid using a plurality of frequencies to transmit to the second node;

filtering a transmission signal to remove power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

transmitting the filtered transmission signal to the second node;

receiving a compressed first feedback from the second node that characterizes receipt of a first signal sent from the first node to the second node;

receiving a compressed second feedback from a third node that characterizes receipt of a second signal sent from the first node to the third node;

decompressing the compressed first feedback resulting in a decompressed first feedback; and

decompressing the compressed second feedback resulting in a decompressed second feedback;

wherein the filtered transmission signal is a filtered first transmission signal that is transmitted to the second node using an 802.11-based orthogonal frequency-division multiplexing (OFDM) protocol via at least one antenna of a plurality of antennas, using a first power that is based on the decompressed first feedback; and further comprising:

transmitting, using the 802.11-based OFDM protocol, a filtered second transmission signal, simultaneously with the filtered first transmission signal, to the third node using a second power that is based on the decompressed second feedback.

54. The method of claim 53, wherein the instruction includes a first instruction, and further comprising:

receiving at the first node in the radio communications network a second instruction transmitted from the third node to avoid using a different plurality of frequencies to transmit to the third node; and

filtering a second transmission signal to remove power from the second transmission signal at each frequency in the different plurality of frequencies to be avoided, resulting in the filtered second transmission signal.

55. The method of claim 53, wherein the first power and the second power are the same.
56. The method of claim 53, wherein the first power and the second power are different.
57. The method of claim 53, and further comprising:
generating a first data structure based on the decompressed first feedback, where the first power is based on the first data structure; and
generating a second data structure based on the decompressed second feedback, where the second power is based on the second data structure.
58. The method of claim 57, wherein the first data structure and the second data structure are different.
59. The method of claim 57, wherein the first data structure and the second data structure are orthogonal.
60. The method of claim 57, wherein the first data structure is unique to the second node, and the second data structure is unique to the third node.
61. The method of claim 57, wherein the first data structure is a first profile, and the second data structure is a second profile.
62. The method of claim 57, wherein the first data structure is a first optimal waveform profile.
63. The method of claim 53, and further comprising:
generating a single data structure based on the decompressed first feedback and the decompressed second feedback, where both the first power and the second power are based on the single data structure.
64. The method of claim 53, wherein the filtered second transmission signal is transmitted

simultaneously with the filtered first transmission signal via the same plurality of antennas.

65. The method of claim 53, wherein the filtered second transmission signal is transmitted simultaneously with the filtered first transmission signal via at least one different antenna of the plurality of antennas.

66. The method of claim 53, wherein the filtered second transmission signal is transmitted simultaneously with the filtered first transmission signal via the at least one antenna of the plurality of antennas.

67. The method of claim 53, wherein an update of the compressed first feedback is repeatedly received, and the first power is repeatedly updated based on an updated decompressed first feedback; and an update of the compressed second feedback is repeatedly received, and the second power is repeatedly updated based on an updated decompressed second feedback.

68. The method of claim 53, wherein an update of the compressed first feedback is repeatedly received in real-time, and the first power is repeatedly updated in real-time based on an updated decompressed first feedback; and an update of the compressed second feedback is repeatedly received in real-time, and the second power is repeatedly updated in real-time based on an updated decompressed second feedback.

69. The method of claim 53, wherein an update of the compressed first feedback is repeatedly received at time periods of less than one second, and the first power is repeatedly updated based on an updated decompressed first feedback at time periods of less than one second; and an update of the compressed second feedback is repeatedly received at time periods of less than one second, and the second power is repeatedly updated based on an updated decompressed second feedback at time periods of less than one second.

70. The method of claim 53, wherein the filtered first transmission signal and the filtered second transmission signal are sent via the same transceiver.

71. The method of claim 53, wherein the filtered first transmission signal and the filtered second transmission signal are sent via different transceivers.
72. The method of claim 53, wherein the compressed first feedback and the compressed second feedback are received utilizing a dedicated channel.
73. The method of claim 53, wherein the compressed first feedback and the compressed second feedback are received via an antenna configured for omnidirectional communication.
74. The method of claim 53, wherein the decompressed first feedback and the decompressed second feedback are used to increase spatial separation among transmissions.
75. The method of claim 53, wherein the decompressed first feedback and the decompressed second feedback are used to increase spatial separation among transmissions at the same frequency.
76. The method of claim 53, and further comprising:
receiving a compressed third feedback from a fourth node that characterizes receipt of a third signal sent from the first node to the fourth node, the fourth node being a legacy node;
decompressing the compressed third feedback resulting in a decompressed third feedback;
transmitting, using a third frequency and another 802.11-based OFDM protocol, the third transmission signal to the fourth node using a third power that is based on the decompressed third feedback.
77. The method of claim 53, wherein the compressed first feedback is based on a received power and one or more frequencies via which the first signal is communicated.
78. The method of claim 53, wherein the compressed first feedback is based on a received power at a plurality of frequencies via which the first signal is communicated.

79. The method of claim 53, wherein the compressed first feedback is based on a series of power values as a function of frequency.
80. The method of claim 53, wherein the compressed first feedback includes a data structure that is based on a series of power values as a function of frequency.
81. The method of claim 53, wherein the instruction is received prior to the receipt of the compressed first feedback.
82. The method of claim 53, wherein the instruction is received separately with respect to the receipt of the compressed first feedback.
83. The method of claim 53, wherein at least three transmission signals are capable of being simultaneously transmitted to at least three different devices, using the same multiple antennas.
84. The method of claim 53, wherein at least three transmission signals are capable of being simultaneously transmitted to at least three different devices, using at least one different antenna.
85. The method of claim 53, wherein the instruction includes a request to send (RTS) instruction.
86. The method of claim 53, wherein the instruction includes a 802.11 clear to send (CTS) instruction.
87. The method of claim 53, wherein the filtered first transmission signal is transmitted using a frequency band that is selected based on the instruction and the filtered second transmission signal is transmitted using the frequency band that is selected based on another instruction received from the third node, where the filtered first transmission signal is transmitted using a first frequency in the frequency band and the filtered second transmission signal is transmitted

using a second frequency in the frequency band.

88. The method of claim 53, wherein the filtered first transmission signal is transmitted using a first frequency and the filtered second transmission signal is transmitted using a second frequency.

89. The method of claim 53, wherein the filtered first transmission signal and the filtered second transmission signal are transmitted using the same one or more frequencies.

90. The method of claim 53, wherein the filtered first transmission signal and the filtered second transmission signal are transmitted using the same frequency band.

91. The method of claim 53, wherein the filtered first transmission signal is transmitted using a first frequency that is based on the instruction and the filtered second transmission signal is transmitted using a second frequency that is based on another instruction received from the third node.

92. The method of claim 53, wherein the filtered first transmission signal is transmitted using a frequency that is based on the instruction and the filtered second transmission signal is transmitted using the frequency that is based on another instruction received from the third node.

93. The method of claim 53, wherein the filtered first transmission signal is transmitted using a frequency band that is selected based on the instruction and the filtered second transmission signal is transmitted using the frequency band that is selected based on another instruction received from the third node.

94. The method of claim 53, wherein at least one of:
the first signal includes a data signal;
the first signal includes an aggregate signal;
the first signal includes a first data signal, and the second signal includes a second data signal;

the first and second signals are reflected in an aggregate signal;
the compressed first feedback is combined with the instruction;
the compressed first feedback is received with the instruction;
the compressed first feedback is configured to ensure that transmissions from all neighbors of the first node are received at a same power level;
the compressed first feedback is configured to at least one of: minimize a transmit power on reliable links, maximize an ability to achieve spatial separation among transmissions on a same frequency, minimize network self-interference, improve low probability of intercept (LPI), or lower probability of detection (LPD);
the compressed first feedback and the compressed second feedback are received simultaneously;
at least one of the compressed first feedback or the compressed second feedback is received before the instruction is received;
at least one of the compressed first feedback or the compressed second feedback is received after the instruction is received;
the steps are performed in the order listed;
the radio communications network includes an 802.11 network;
the radio communications network includes an 802.11a network;
the radio communications network includes an 802.11g network;
the at least one antenna includes multiple antennas; the at least one antenna includes at least one omnidirectional antenna;
the at least one antenna includes at least one directional antenna;
interference in the radio communications network is managed;
the first node is a mobile node and the second node is a non-mobile node;
the second node is a mobile node and the first node is a non-mobile node;
the instruction sets forth the plurality of frequencies to avoid using;
the instruction specifies the plurality of frequencies to avoid using;
a purpose of the instruction is to avoid using the plurality of frequencies;
a purpose of the instruction is to avoid using the plurality of frequencies, where the purpose is accomplished by specifying the plurality of frequencies to avoid using;

a purpose of the instruction is to avoid using the plurality of frequencies, where the purpose is accomplished by specifying one or more frequencies to use;

a purpose of the instruction is to avoid using the plurality of frequencies, where the purpose is accomplished by specifying one or more frequencies to use, the one or more frequencies not including the plurality of frequencies;

the instruction to avoid the plurality of frequencies sets forth one or more frequencies to use;

the instruction to avoid the plurality of frequencies specifies one or more frequencies to use;

the instruction to avoid the plurality of frequencies assigns one or more frequencies to use;

the instruction to avoid the plurality of frequencies does not specify the plurality of frequencies;

the instruction to avoid the plurality of frequencies sets forth one or more frequencies to use, thereby resulting in the avoidance of using the plurality of frequencies;

a purpose of the filtering is to remove the power from the transmission signal at each frequency in the plurality of frequencies to be avoided, where the purpose is accomplished by specifying one or more frequencies to which the power is to be applied;

a purpose of the filtering is to remove the power from the transmission signal at each frequency in the plurality of frequencies to be avoided, where the purpose is accomplished by specifying the plurality of frequencies to be avoided;

the filtering suppresses or otherwise minimizes waves or oscillations at each frequency in the plurality of frequencies to be avoided;

the filtering suppresses or otherwise minimizes waves or oscillations at each frequency in the plurality of frequencies to be avoided, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the filtering removes all power from the transmission signal;

the filtering removes some power from the transmission signal;

the filtering discards one or more portions of the transmission signal at each of the plurality of frequencies;

the filtering utilizes transmit excision;

the filtering utilizes compression;

the filtering identifies certain one or more frequencies in connection with which power is applied, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by an adjustment in relation to power previously used in connection with the transmission signal;

the removal of power from the transmission signal at each frequency in the plurality of frequencies is accomplished by adjusting a processing of the transmission signal so that power that was previously used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided, is no longer used in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by setting a waveform profile that results in no power being applied in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by pre-processing the transmission signal, before any power is applied, so that power, which would otherwise be applied in connection with the transmission signal at each frequency in the plurality of frequencies, is not applied in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the removal of power from the transmission signal at each frequency in the plurality of frequencies to be avoided is accomplished by pre-processing the transmission signal, before any power is applied, so that no power is applied in connection with the transmission signal at each frequency in the plurality of frequencies to be avoided;

the transmission signal includes a plurality of packets;

the transmission signal includes a plurality of different transmissions;

the transmission signal includes a plurality of transmissions to the second node;

the transmission signal includes a plurality of differently-timed transmissions to the second node;

the transmission signal includes a plurality of transmission components to the second node, each with different power levels;

the transmission signal includes a plurality of transmission components to the second node, each with different power levels as a result of different instances of the filtering;

the transmission signal is generated so as to not include power at each frequency in the plurality of frequencies to be avoided;

the transmission signal is generated so as to not include power at each frequency in the plurality of frequencies to be avoided, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the transmission signal is pre-processed so as to not include power at each frequency in the plurality of frequencies to be avoided, thereby resulting in the removal of the power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

the filtering is performed using an output filter;

the filtering is performed using an optimal matched filter;

the filtering is performed using a band selection filter;

the filtering is performed using a median filter; or

the filtering is performed using a nonlinear filter.

95. A method for managing interference in a radio communications network, comprising the steps of:

receiving at a first node in the radio communications network an instruction transmitted from a second node in the radio communications network to avoid using a plurality of frequencies to transmit to the second node;

filtering a transmission signal to remove power from the transmission signal at each frequency in the plurality of frequencies to be avoided;

transmitting the filtered transmission signal to the second node;

separately from the receipt of the instruction, receiving a particular signal at the first node that is transmitted from the second node;

generating a feedback based on a received power and one or more frequencies via which the particular signal is received;

compressing the feedback; and

transmitting the compressed feedback from the first node to the second node, for use by the second node in determining a transmit power with which the second node transmits to the first node via at least one antenna of a plurality of antennas, while simultaneously transmitting to one or more other nodes;

wherein the filtered transmission signal is transmitted to the second node using an 802.11-based orthogonal frequency-division multiplexing (OFDM) protocol;

wherein an update of the compressed feedback is repeatedly generated, compressed, and transmitted at time periods of less than one second; so that the transmit power is repeatedly updated based thereupon at time periods of less than one second.

96. The method of claim 95, wherein the instruction includes a first instruction and the filtered transmission signal includes a filtered first transmission signal, and further comprising:

receiving at the first node in the radio communications network a second instruction transmitted from a third node in the radio communications network to avoid using a different plurality of frequencies to transmit to the third node;

filtering a second transmission signal to remove power from the second transmission signal at each frequency in the different plurality of frequencies to be avoided; and

transmitting the filtered second transmission signal to the third node.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. 1.550(f), the undersigned certifies that on June 3, 2025, copies of:

- (1) Response to Office Action;
- (2) Exhibit 2001;
- (3) Exhibit 2002;
- (4) Information Disclosure Statement; and
- (3) Certificate of Service

were served in their entirety by first class mail on the third party requester, Unified Patents, LLC, at the following address of record:

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