

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC.
Petitioner,

v.

MASSIVELY BROADBAND, LLC,
Patent Owner.

CASE: IPR2025-01565
Patent 8,350,763

PATENT OWNER'S PRELIMINARY RESPONSE

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I. INTRODUCTION

MASSIVELY BROADBAND LLC (“Patent Owner”) submits this Patent Owner Preliminary Response pursuant to 37 C.F.R. § 42.107(a) to the *Inter Partes* Review petition (“Petition” or “Pet.”) filed by Samsung Electronics Co., Ltd. and Samsung Electronics America, LLC (“Petitioner”) for all seventeen (17) claims (the “Challenged Claims”) of Patent 8,350,763 (“’763 Patent”). The Board should deny institution because the Petition fails, on every asserted ground, to establish a reasonable likelihood that any Challenged Claim is unpatentable.

First, Petitioner’s case rests on a series of fundamental mischaracterizations of the claimed invention and the cited prior art, which does not disclose all of the elements of the Challenged Claims. Petitioner repeatedly relies on static, fixed-geometry antenna structures with frequency behavior determined by physical layout and feed-point placement. These fixed-geometry structures differ fundamentally from the electronically tunable antenna systems claimed in the ’763 Patent, which teaches run-time adjustments to enable a single antenna to be used by multiple radios (e.g., transmitters, receivers or transceivers) and/or frequency bands, including simultaneously, through tuner and controller circuitry. The Petition also treats single-band radios as “multiband” devices without support in the references.

Second, the Petition substitutes conclusory assertions of “simple

substitution” or “known techniques” for the reasoned, reference-specific analysis that is required under controlling law.

Third, across all asserted grounds, the Petition fails to show that the cited references—either individually or in combination—disclose or suggest the core architectural features of the Challenged Claims, including tunable antennas under electronic control, tuners associated with multiband transmitters, receivers, or transceivers, and, for certain claims, simultaneous multiband operation at the component level. The proposed combinations also suffer from unexplained technical incompatibilities and are supported only by hindsight reconstruction, with the expert declaration largely tracking the Petitioner’s argument rather than supplying independent technical analysis.

Petitioner has not met its burden under 35 U.S.C. § 314(a) to establish a reasonable likelihood of success as to any claim on any asserted ground. The Board should deny institution.

II. STATEMENT OF THE PRECISE RELIEF REQUESTED

Patent Owner requests that the Board deny institution of the Petition with respect to all the Challenged Claims (claims 1-17) and all asserted grounds.

III. BACKGROUND

A. Summary of the ’763 Patent

The ’763 patent addresses a fundamental challenge in the design of compact wireless devices—supporting an increasing number of wireless frequency bands

without requiring an impractical number of discrete antennas. The '763 Patent explains that then-contemporary wireless devices such as laptops, cellphones, and other portable equipment typically require multiple separate antennas, each designed to operate at a specific frequency band such as cellular, Bluetooth, and Wi-Fi. EX1001, 1:23-28. This need for numerous band-specific antennas creates significant mechanical and design challenges, as manufacturers must route feedlines and connections between various transmitter, receiver, and transceiver circuits and the antennas that must be mounted or housed within increasingly compact device enclosures. *Id.*, 1:28-38, 4:60-5:2. As the number of wireless standards proliferates, the patent recognizes that portable devices may need to support ten or more distinct frequency bands, exacerbating the need for multiple antennas and compounding mechanical, spatial, and performance challenges. *Id.*, 1:44-46.

The '763 Patent provides a different and more flexible approach: a tunable antenna system whose operating band can be electronically adjusted—either actively or passively—under control of onboard circuitry. Rather than dedicating separate antennas to separate bands, the invention allows a single antenna structure to be tuned—actively or passively—and shared among multiple transmitters, receivers, or transceivers that operate in different frequency bands. *Id.*, 3:61-67, 5:14-30. In certain embodiments, the system even supports simultaneous

multiband operation, enabling concurrent transmission or reception across multiple bands without switching between them. *Id.*, 4:12-20, 6:34-36, 10:9-14.

The patent discloses several embodiments illustrating this architecture. In one group of embodiments (Figs. 2–3), multiple single-band transceivers are each connected to a respective tuner whose characteristics can be electronically adjusted; a controller coordinates the tuning so that the multiband antenna can operate at the desired band for a particular transceiver. Depending on the configuration and level of isolation, the system can support either time-multiplexed or simultaneous operation across multiple bands. In another embodiment (Fig. 4), a combined multiband transceiver communicates through a multiband tuner to the multiband antenna, enabling flexible multiband operation. As shown in Fig. 5, the multiband transceiver can communicate through a multiband tuner that matches the multiband antenna to different frequency bands, including the ability to handle multiple bands concurrently.

The '763 Patent contains seventeen claims, including independent claims 1, 6, 10, 13, and 17. Claims 1, 6, and 17 are closely related, as each recites a wireless device or component in which at least one antenna is used across a plurality of different frequency bands, with the antenna being either actively tuned or tuned by one or more passive elements that are selected or interconnected using electronic control. Claim 6 builds on claim 1 by further requiring a multiband transmitter,

receiver, or transceiver, as well as a tuner and a controller for controlling the tuning of the tuner to operate in multiple bands. Claim 17, while similar, is directed to a wireless device component comprising a tuner or set of tuners, or a controller or other circuitry, that is configurable to be coupled to at least one antenna and a plurality of transmitters, receivers, or transceivers operating at one or more frequency bands, with the antenna being actively or passively tuned under electronic control.

Independent claims 10 and 13 add a requirement of simultaneous operation in multiple bands. Claim 10 recites a wireless device with at least one multiband antenna, at least one multiband transmitter, receiver, or transceiver, and a tuner that matches the antenna to the transceiver or transceivers in a plurality of different bands simultaneously. Claim 13 similarly requires that at least one component transmits or receives electromagnetic energy simultaneously at two or more of the supported bands. The dependent claims provide further details and limitations regarding the types of devices, the nature of the tuning elements, and the configuration of the tuners and controllers.

B. Priority

The '763 Patent application was filed August 14, 2009 and claims priority to a provisional application (Ser. No. 61/088,829) filed August 14, 2008.

C. Level of Ordinary Skill

For purposes of this Preliminary Response, Patent Owner accepts the skill level proposed by Petitioner for a person of ordinary skill in the art (“POSITA”). Petitioner’s proposed POSITA is a person having a “at least a Bachelor’s degree in electrical engineering, computer engineering, physics, or a related field, and at least two years of experience working with design and integration of RF circuits and antennas for wireless communication devices,” where “[m]ore education can substitute for practical experience and vice versa.” Pet., 5-6. Patent Owner reserves the right to address or refine the level of ordinary skill at a later stage of this proceeding or in any parallel litigation, should the POSITA’s skill level become relevant.

D. Claim Construction

Patent Owner agrees with Petitioner that, for purposes of this Preliminary Response, all claim terms should be given their plain and ordinary meaning as understood by a POSITA. However, as discussed below (*see* Section IV.3.b regarding “multiband antenna”), Petitioner does not apply the plain and ordinary meaning of certain claim terms, nor does Petitioner explain what the ordinary meaning should be.

To the extent any dispute exists regarding the meaning of a claim term, such dispute does not provide a basis for institution. The Petition fails under the claim

terms' plain and ordinary meanings, and Patent Owner reserves the right to address claim construction post-institution if necessary.

E. The Petitioner's Asserted Ground

1. Grounds Asserted in the Petition

Petitioner asserts that the Challenged Claims are unpatentable under the following asserted grounds:

Ground	Basis	Reference(s)	Claims
I	§102/§103	Wen	1-3, 5
II	§103	Wen in view of Ella	4, 17
III	§103	Wen in view of Ella and Govind	6-15
IV	§103	Wen in view of Ella, Govind, and Vlahos	16
V	§103	Rubinshteyn in view of Wen	1-3, 5
VI	§103	Rubinshteyn in view of Wen and Ella	4, 17
VII	§103	Rubinshteyn in view of Ella	6-15
VIII	§103	Rubinshteyn in view of Ella and Vlahos	16

2. Prior Art Relied Upon for Asserted Grounds

a. Wen (EX1004)

Wen discloses a single, fixed-geometry, multi-feed antenna that supports operation at multiple frequencies by providing multiple spatially separated feed

points, each associated with a different operating band. EX1004, ¶[0027]. The antenna can be “substantially linear” or, as shown in Wen’s Fig. 2, can be a patch antenna. *Id.*, ¶[0033]. Multiple single-band RF transceivers, each hardwired to its own feed point, may share this antenna and, in some embodiments, may even operate “at the same time.” *Id.*, ¶[0027], Fig. 1. Each operating band is achieved not through any type of electrical tuning, but through the static physical layout of the antenna, including slots, leg lengths, and feed-point placement. *Id.*, ¶¶[0027]-[0035], Fig. 2. Wen does not disclose any tuner, tunable element, impedance-matching network, or controller-adjusted mechanism capable of run-time adjustments to enable a single antenna to be used by multiple radios and/or frequency bands. Rather, the resonant behavior of the antenna is fixed by its physical structure at fabrication. Wen’s “controller” merely selects which transceivers are active; Wen’s system does not perform antenna tuning. *Id.*, ¶[0039].

b. Rubinshteyn (EX1006)

Rubinshteyn discloses a planar inverted-F antenna (PIFA) incorporating a low-band element and a high-band element that are simultaneously resonant at two different frequencies. EX1006, ¶¶[0016], [0022]–[0023]. This enables a wireless device (e.g., a cellular handset) to operate simultaneously at two frequencies set by the geometry of the PIFA. *Id.*, ¶[0016]. To provide additional tuning within the

two operating bands, Rubinshteyn connects tuning circuits—implemented with PIN-diode-switched capacitors or similar reactances—to the low-band and high-band antenna elements, allowing their respective center frequencies to be electronically shifted. *Id.*, ¶¶[0026]–[0036]; Fig. 4. A processor or controller adjusts the tuning circuits to select new frequency pairs. *Id.*, ¶[0028]. Rubinshteyn focuses on the antenna structure and its tuning circuits and is silent regarding the transmitter and receiver architectures, offering no description of whether the associated transmitter, receiver, or transceiver circuitry is single-band or multiband. The RF front end is shown generically as a “transmitter,” “receiver,” and “duplexer” (Fig. 1) without any teaching that Rubinshteyn’s “transmitter,” “receiver,” and “duplexer” operate across multiple frequency bands or are capable of multiband or concurrent multiband operation. Although Rubinshteyn teaches an antenna that may resonate simultaneously at two frequencies, Rubinshteyn does not disclose or suggest a “multiband transmitter,” “multiband receiver,” or “multiband transceiver,” nor any circuitry capable of concurrent multi-frequency operation. Further, Rubinshteyn does not teach tuning circuits that are coupled to feedlines for multiple radios.

Moreover, Rubinshteyn’s tuning is directed to matching networks coupled to antenna elements, not to tuning the antenna system itself. The disclosed PIN-diode-switched capacitors selectively adjust matching conditions associated with

fixed antenna elements to shift their center frequencies. *Id.*, ¶¶[0026]–[0036].

Rubinshteyn does not describe altering the radiating structure of the antenna or dynamically changing the natural resonant characteristics of the antenna. By contrast, the '763 Patent, through tuner and controller circuitry, provides run-time adjustments to enable a single antenna to be used by multiple radios and/or frequency bands. EX1001, 6:9-17, 8:10-26, 9:17-26. At most, Rubinshteyn teaches a particular form of discrete matching-network tuning, not the tunable-antenna architectures claimed in the '763 Patent.

c. Ella (EX1005)

Ella discloses an adaptive impedance-matching apparatus for a single antenna element that operates in two resonant frequency bands. The system employs a matching circuit, two variable reactance components such as tunable capacitors, a detector for measuring an impedance-related parameter such as Voltage Standing Wave Ratio (“VSWR”), and a controller that selects reactance ratios that optimize performance in either the first or second band. EX1005, Abstract, 1:39-56, Figs. 2–3. Ella focuses exclusively on antenna-side impedance matching in response to detuning effects caused by user interaction or environmental changes. Ella uses electronically adjustable reactance components, but does not disclose any tunable antenna in the sense of altering the operating band of the antenna or describe any plurality of transmitters, receivers, or

transceivers, any multiband transceiver, or any architecture supporting simultaneous multiband operation.

d. Govind (EX1008)

Govind describes semiconductor-integrated RF components, including on-chip inductors, capacitors, filters, and matching networks intended to improve RF performance and reduce size in integrated circuits. EX1008, 2:8-20. In certain embodiments, Govind discusses antenna coupling concepts, including single-band and multiband antennas, and architectures that can support multiband and even simultaneous multiband operation through reuse and routing of RF front-end components. *Id.*, 17:18–62, Fig. 15. Govind, however, focuses on RF system integration, signal routing, and reuse of passive components, not on tuning the antenna itself. Govind contemplates selecting among fixed frequency bands or switching between antenna paths to access different bands, but does not disclose run-time adjustments to enable a single antenna to be used by multiple radios and/or frequency bands through tuner and controller circuitry. At most, Govind describes multiband operation through architectural selection or switching among fixed bands, which is fundamentally different from the tunable-antenna systems claimed in the '763 Patent.

e. Vlahos (EX1013)

Vlahos concerns receiver architecture for multiband radiotelephones and

teaches techniques for reducing the number of mixers used in multiband receivers. EX1013, Abstract, 1:47-66. Vlahos describes antenna circuitry and fixed matching networks designed to accommodate specific, predefined frequency bands such as GSM 900, DCS 1800, and PCS 1900. *Id.* Vlahos focuses on receiver-side signal routing, combination filters, mixer design, and impedance matching tailored to the above-identified bands. Vlahos addresses multiband operation, but does so by providing separate, fixed matching paths for each band rather than by tuning. *Id.*, 4:10-45. Instead, the antenna matching in Vlahos is predetermined and static, selected for specific bands at design time.

IV. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD OF SUCCESS ON A SINGLE CLAIM

The Board should deny institution of the IPR because Petitioner has failed to establish a likelihood that Petitioner will succeed in showing that any Challenged Claim is unpatentable under any asserted ground. 35 U.S.C. § 314(a).

A. The Asserted Grounds Fail to Teach or Suggest All Elements of the Challenged Claims

The IPR should not be instituted because Petitioner's asserted grounds fail to teach or suggest all the elements of the Challenged Claims. 37 C.F.R.

§ 42.104(b)(4) ("The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon").

1. Independent Claim 1 of '763 Patent

a. Ground I: Anticipation or Obviousness (Wen)

Petitioner's anticipation and obviousness challenges to claim 1 based on Wen fail for a fundamental reason—Wen does not disclose a tunable antenna. Claim 1 of the '763 Patent requires that the antenna itself be tunable, either through active tuning or through passive tuning elements that are electronically selected or interconnected. EX1001, 10:23–30. Wen satisfies neither alternative. Wen's common-antenna architecture does not meet any of the tunability requirements of claim 1 because Wen's operating bands are fixed by design-time physical geometry, not adjusted through electronic control at run time.

Wen describes “a common antenna . . . having a plurality of spaced apart signal feed points thereon” shared by multiple single-band transceivers, and a controller that “selectively operat[es] at least some of the wireless RF transceivers to use the common antenna at a same time.” EX1004, ¶[0027]. Each supported frequency band arises from the static physical layout of the antenna—its slots, leg widths and lengths, and the positions of its feed points—which “may be . . . selected to tune the desired operating frequencies” only at fabrication. *Id.*, ¶¶[0035]–[0036]. Wen's figures likewise depict feed ports pre-assigned to specific bands (*e.g.*, 900 MHz/1800 MHz/5 GHz for one feed; 2.45 GHz for another; 2.1/5.2/5.8 GHz for a third; 1.54 GHz for a fourth). *Id.*, ¶¶[0039]–[0040], Figs. 2-

18.

Wen does not disclose a tuner, any tunable reactance, any active or passive matching network under electronic control, or any circuitry configured to alter the resonant behavior of the antenna at run time. Wen's controller merely determines which radios—and thus which fixed feed points—are active. Wen's controller does not control any antenna-side components to change frequency response. *Id.*, ¶[0031]. Although Wen's background references prior work involving MEMS-switch-based reconfiguration (*id.*, ¶[0005]), Wen itself does not implement any electronically adjustable elements. Wen simply discloses concurrent shared use of a static, multi-feed patch antenna, not a tunable antenna.

The fact that Wen does not disclose a tunable antenna is fatal to both of Petitioner's asserted theories. Petitioner first asserts anticipation based on the passive-tuning prong of claim 1, arguing that Wen discloses passive elements for tuning its antenna. Pet., 12. But Petitioner itself acknowledges that Wen may “not disclose using electronic control to select passive elements for tuning,” *id.*, 16—even though claim 1 expressly requires that any passive tuning elements “are selected or interconnected using electronic control.” EX1001, 10:28. Because Wen's frequency bands are fixed by physical structure and not electronically adjustable at run time, Wen cannot satisfy the passive-tuning alternative of claim 1.

Petitioner therefore pivots to an obviousness theory based on the actively

tuned antenna prong of claim 1. Pet., 16. That theory also fails. In the context of the '763 Patent, “active tuning” refers to electronic adjustment that enables an antenna for use by multiple radios and/or frequency bands at run time under the direction of a controller. The transformation can include dynamically controlling characteristics such as resonant frequency of different radios, isolation between radios, or impedance seen by different radios. EX1001, 4:40–45, 5:22–30, 6:34–36, 8:8–13. Wen contains no active tuning elements. The only “selection” Wen’s controller performs is selection among transceivers feeding fixed, pre-assigned antenna ports. Selection of the transceiver, however, does not tune the antenna, nor does it alter the electrical characteristics so that the antenna can operate with multiple radios and/or frequency bands.

Finally, although Petitioner and Dr. Mahon invoke “plain and ordinary meaning” for all claim terms (Pet., 6; EX1003, ¶54), neither identifies the plain and ordinary meaning of “actively tuned antenna” in the context of claim 1, where a “plurality” of radios (transmitters, receivers, or transceivers) use a single antenna. Nor does Petitioner or its expert cite any intrinsic or extrinsic evidence supporting the unstated interpretation on which their analysis relies. The intrinsic evidence of the '763 Patent makes clear that an “actively tuned antenna” requires electronic adjustment that transforms the electrical properties of an antenna for use by multiple radios at run time through tunable elements—not mere selection among

fixed feed points. EX1001, 4:40–45, 5:22–30, 6:34–36, 8:8–13. Petitioner’s attempt to equate Wen’s transceiver selection with antenna tuning is unsupported and contrary to the claim language and specification.

Accordingly, Petitioner has not shown that claim 1 is anticipated or would have been obvious over Wen.

b. Ground V: Obviousness (Rubinshteyn and Wen)

Claim 1 requires “a plurality of transmitters, receivers, or transceivers that operate in one or more frequency bands.” Under ordinary English grammar and Federal Circuit precedent, “a plurality of X” means more than one X of the same type. *SIMO Holdings Inc. v. Hong Kong uCloudlink Network Tech. Ltd.*, 983 F.3d 1367, 1376-78 (Fed. Cir. 2021) (interpreting “a plurality” of items in a conjunctive list as a plurality of each item in the conjunctive list). The wording of claim 1 does not mean a mixture of single, different types of components chosen from a set. Thus, contrary to Petitioner’s assertions (Pet. 53-54; EX1003, ¶175), Rubinshteyn’s single transmitter and single transceiver do not constitute “a plurality of transmitters, receivers, or transceivers,” as recited in claim 1.

Petitioner alternatively asserts that it would have been obvious to modify Rubinshteyn based on Wen to use a plurality of transceivers. Pet. 54. Petitioner, however, never explains how Wen’s plurality of single-band transceivers could be used to “modify” Rubinshteyn’s radio architecture. Rubinshteyn is built around a

single multiband transmitter and a single multiband receiver feeding a single shared RF port through a duplexer. EX1006, ¶[0022], Fig. 1. Wen, contrarily, requires multiple physically distinct feed points, each driven by its own single-band transceiver hard-wired to a fixed frequency. EX1004, ¶[0027], Fig. 1. Petitioner fails to explain how a POSITA would integrate, substitute, or retrofit Wen’s single-band, multi-feed architecture into Rubinshteyn without discarding the multiband RF chain and redesigning the device around multiple independent single-band radios. That omission is fatal. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380-81 (Fed. Cir. 2016) (petitioner bears burden of proof and Board must base its decision on argument advanced by party).

Rubinshteyn and Wen solve different problems with fundamentally incompatible architectures: Rubinshteyn enables multiband operation through a single RF chain and shared feed, while Wen uses multiple single-band radios tied to multiple feed points. Petitioner has not shown how Wen’s multiple-single-band radio architecture can be applied to Rubinshteyn’s single-RF-chain/shared-feed architecture.

2. Independent Claim 6 of ’763 Patent

a. Ground III: Obviousness (Wen, Ella and Govind)

Claim 6 recites (i) “at least one multiband transmitter, receiver or transceiver” **and** (ii) a “tuner associated with said at least one multiband

transmitter, receiver, or transceiver.” EX1001, 10:51-53. Petitioner’s Ground III combination fails to disclose or suggest both elements.

i. Combination Fails to Disclose or Suggest the
“Tuner” of Claim 6

Neither Wen nor the proposed combination of Wen with Ella and Govind discloses or suggests the “tuner” of claim 6. Wen’s architecture is fundamentally incompatible with the presence of a tuner. Wen relies on a fixed-geometry, multi-feed antenna, in which each feed point is hardwired to a corresponding transceiver and each supported frequency band is determined at design time by the physical layout of the antenna. EX1004, ¶¶[0035]–[0040]. Wen’s controller merely selects which transceiver is active and does not transform the frequency response or impedance of the antenna for use by one or more radios at run time. *Id.*, ¶[0031]. Wen discloses no structure or circuitry—active or passive—that could function as a tuner, nor any mechanism for electronically controlled tuning of the antenna.

Petitioner, however, argues that Wen discloses tuning the operating frequencies of Wen’s common antenna by selectively connecting transceivers to corresponding feed points, and that it would have been obvious to add a tuner between Wen’s antenna and transceivers as taught by Ella. Pet., 33–34. That argument fails because selecting among fixed feed points is not tuning, and Wen’s architecture provides no place for a tuner to operate. Adding a tuner to Wen’s

system would require fundamentally altering Wen’s design, which is expressly premised on static, pre-assigned frequency bands and hardwired feed points.

Petitioner’s reliance on Ella does not cure this deficiency. Ella discloses a single-band adaptive impedance matching network, designed to optimize performance in one of two bands, not a multiband tuner associated with a multiband transceiver. EX1005, 5:64–6:24. Ella does not disclose or suggest a tuner capable of coordinating tuning across multiple bands. Nor does Ella address how a multiband tuner would operate in a system like Wen’s that lacks any mechanism for run-time, electronically controlled antenna tuning.

Petitioner’s assertion that Ella’s tuner “serves the same purpose” as the claimed tuner—impedance matching—does not satisfy claim 6. The claim requires a tuner “associated with” a multiband transmitter, receiver, or transceiver and controlled to tune the antenna across multiple bands. Neither Wen nor Ella discloses or suggests tuning the antenna across multiple bands, individually or in combination.

ii. Prior Art Fails to Disclose or Suggest the
“Multiband” Transmitter, Receiver, or Transceiver

Neither Wen nor the proposed combination of Wen, Ella, and Govind discloses or suggests “at least one multiband transmitter, receiver or transceiver” as recited in claim 6. Wen’s system is expressly built around multiple single-band

transceivers, each hardwired to a separate feed point on a fixed-geometry, multi-feed antenna. Wen repeatedly describes each transceiver as having a “respective different operating frequency,” with each feed point pre-assigned to a particular band by the physical design of the antenna. EX1004, ¶¶[0031], [0039]. Wen supports multiple frequency bands only by providing multiple single-band transceivers, not by using any transmitter, receiver, or transceiver that itself operates across multiple bands. Nothing in Wen discloses or suggests a multiband transmitter, receiver, or transceiver.

Govind discloses “multiband, multimode integrated RF transceiver topologies.” EX1008, 2:8–13, 2:21–31. But Govind does not disclose or suggest integrating a multiband transceiver into an architecture like Wen’s, which relies on multiple single-band transceivers, each hardwired to a distinct feed point and selected by a controller. The Petition does not explain how a Govind-style multiband transceiver would operate within Wen’s controller-driven transceiver-selection scheme, or how the substitution of Govind’s multiband transceiver could be made into Wen without discarding Wen’s disclosed operating principle. Additionally, Govind provides no guidance on how Govind’s transceiver could be integrated into a system like Wen’s.

Moreover, Govind does not disclose or suggest a multiband tuner associated with a multiband transceiver as required by claim 6. Govind also does not disclose

any mechanism for controlling antenna tuning across multiple bands in conjunction with a multiband transceiver. Petitioner does not explain how Wen's architecture would be modified to accommodate a multiband transceiver, how the transceiver would interact with the antenna, or how the claimed multiband tuning functionality would be achieved.

Accordingly, the proposed combination relies on the existence of multiband transceivers in the abstract, rather than on any teaching or suggestion in the cited references explaining how Wen would be modified to incorporate such a transceiver. That is insufficient to disclose or suggest the claimed "multiband transmitter, receiver, or transceiver."

iii. Failure to Teach Both Elements Is Dispositive

The failure of the prior art to teach or suggest even one element is dispositive. Here, the prior art fails to teach or suggest both a tuner and a multiband transmitter, receiver, or transceiver. Wen lacks both a tuner and a multiband transceiver; Ella's tuner is not a multiband tuner and is not integrated with a multiband transceiver; and Govind's multiband transceiver is not integrated with a multiband tuner or with Wen's architecture. Petitioner, therefore, fails to show that claim 6 would have been obvious over Wen, Ella, and Govind.

- b. Ground VII: Obviousness (Rubinshteyn and Ella)
- i. Rubinshteyn does not disclose “at least one multiband transmitter, receiver or transceiver,” nor the claimed association of a tuner with a multiband device.

Claim 6 requires “at least one multiband transmitter, receiver or transceiver,” a “tuner associated with said at least one multiband transmitter, receiver or transceiver,” and “a controller for controlling tuning of the tuner to a plurality of different bands.” Rubinshteyn does not disclose, suggest, or support the claimed architecture.

Rubinshteyn describes a wireless device having a single transmitter and a single receiver connected through a duplexer to a single RF input point of a tunable PIFA antenna. EX1006, ¶¶[0018], [0022], Fig. 1. Rubinshteyn’s disclosed innovation lies in antenna-side tuning circuits implemented using PIN diodes, capacitors, and a controller that electronically alter the resonant center frequency of the antenna, allowing the antenna to be resonant at two different frequencies. *Id.*, Abstract, ¶¶[0016], [0022], [0028]–[0036], Fig. 1.

Critically, Rubinshteyn’s RF chain remains single-band. Antenna frequency agility does not transform the transmitter, receiver or transceiver into a “multiband” device. The tuning circuits disclosed in Rubinshteyn are connected to the antenna elements and are not within the transmitter. Nor are Rubinshteyn’s tuning circuits placed in an antenna tuner that is coupled between an antenna and a

multiband transmitter, receiver, or transceiver. Rubinshteyn's tuning circuits adjust the resonance of the antenna coupled to a single RF feed—not to enable a multiband transmitter, receiver, or transceiver to operate across multiple bands, as required by claim 6. *Id.*, ¶¶[0026]–[0034].

Because Rubinshteyn employs only a single transmitter and a single receiver and places its tuning circuitry on the antenna rather than in association with a multiband RF device, Rubinshteyn does not satisfy the requirement of claim 6 for “at least one multiband transmitter, receiver or transceiver.” Rubinshteyn also does not satisfy the requirement of claim 6 that the tuner be “associated with” a multiband device. Claim 6 requires an architectural relationship in which the tuner is associated with a multiband transmitter, receiver, or transceiver and controlled to tune the antenna for that multiband device across multiple bands—an arrangement wholly absent from Rubinshteyn.

- ii. Ella does not cure the missing multiband device or the claimed “association” and control relationships.

Because, as discussed above, Rubinshteyn does not disclose a multiband transmitter, receiver, or transceiver, the proposed Rubinshteyn–Ella combination necessarily fails unless Ella supplies that missing architectural element. Ella does not.

Ella discloses an adaptive impedance-matching or tuning apparatus for an

antenna, including variable reactance components, a matching circuit, a detector, and a controller, designed to optimize antenna performance across two resonant bands. EX1005, 3:65–4:50, 5:29–56, 7:29–32. But Ella **does not** disclose a multiband transmitter, receiver, or transceiver, so incorporating Ella’s antenna-matching network into Rubinshteyn would not transform Rubinshteyn’s single-band transmitter or receiver into a multiband device, nor would it supply the missing multiband capability required by claim 6.

Absent a multiband transmitter, receiver, or transceiver, the additional structural and functional requirements of claim 6 cannot be met. There is nothing with which the tuner could be “associated” as a multiband device, and the requirement of claim 6 that “at least one antenna . . . is used by said at least one multiband transmitter, receiver or transceiver in a plurality of different bands” likewise is not satisfied.

Petitioner likewise identifies no disclosure in Rubinshteyn or Ella of a controller that controls tuning of a tuner associated with a multiband transmitter, receiver, or transceiver across multiple bands, as claim 6 requires. Rubinshteyn’s controller controls antenna-side tuning circuits, not a tuner associated with a multiband RF device. EX1006, ¶¶[0028]–[0036]. Ella’s controller similarly controls an antenna-matching apparatus, not a tuner associated with a multiband transceiver. EX1005, 4:40–44, Fig. 2, 7:30–37, 7:59–8:50.

Accordingly, Ella does not cure the absence of a multiband transmitter, receiver, or transceiver in Rubinshteyn, and the proposed combination fails to disclose or suggest the claimed association and control relationships claim 6 requires.

- iii. Petitioner provides no “rational underpinning” to modify Rubinshteyn with Ella to supply the missing multiband device and the claim-specific association/control linkages.

To establish obviousness, Petitioner must articulate why a POSITA would combine the references in the manner claimed, with a rational underpinning for the specific selection and integration of components and relationships. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Here, Petitioner does not identify (i) any prior-art teaching in Rubinshteyn or Ella that would prompt a POSITA to replace Rubinshteyn’s single transmitter/receiver with a multiband device (as required by claim 6); (ii) any reasoned explanation for reconfiguring Rubinshteyn’s antenna-side tuning into a tuner associated with that hypothetical multiband device, or (iii) any reasoned explanation for implementing a controller to “control tuning of the tuner to a plurality of different bands” in that association, as recited in claim 6. Neither reference suggests abandoning Rubinshteyn’s antenna-side tuning architecture in favor of a tuner “associated with” a multiband device, and Petitioner fails to identify any rationale for departing from both references’ design premises.

Further, Petitioner's reliance on Ella's antenna tuning does not supply the missing multiband element or the claim-specific association/control linkages.

iv. Conclusion.

Rubinshteyn lacks a multiband transmitter, receiver, or transceiver and places its tuning circuits on the antenna, not "associated with" a multiband device. EX1006, ¶[0022], Figs. 1, 4–5. Ella discloses an antenna-matching/tuning apparatus, but does not disclose a multiband transmitter/receiver/transceiver and does not provide the claimed association and controller-controlled tuning to a plurality of different bands in relation to a multiband device. EX1005, 4:19–57, 7:30–37, 7:59–8:50. Petitioner, therefore, fails to show that claim 6 would have been obvious over Rubinshteyn and Ella.

3. Independent Claim 10 of the '763 Patent

a. Ground III: Obviousness (Wen, Ella and Govind)

Claim 10 requires "a tuner associated with said at least one multiband transmitter, receiver, or transceiver, said tuner matching said at least one multiband antenna to the said at least one multiband transmitter, receiver, or transceiver in a plurality of different bands simultaneously." Petitioner's Ground III fails to teach or suggest the claimed tuner.

Neither Wen nor Govind discloses a tuner, and Petitioner does not assert that they do. For the "tuner" element, Petitioner relies on Ella. Pet. 22-25, 36, 34.

Ella's tuner, however, does not satisfy claim 10 because Ella's tuner is not "associated with" the multiband transmitter, receiver, or transceiver. Ella discloses an adaptive impedance-matching network connected between an antenna and a conventional transceiver, but Ella does not disclose any multiband transmitter, receiver, or transceiver. Ella also does not suggest associating its tuner with any multiband transmitter, receiver, or transceiver. Ella's tuner is associated with—and controlled to tune—the antenna, not a multiband RF chain. EX1005, 4:24-26, 5:36-39, Fig. 1 (apparatus 14 located between antenna 12 and transceiver 16). Thus, even if Ella discloses a tuner, Ella's tuner is not the tuner that claim 10 requires.

Nor can Petitioner cure this deficiency by appealing to Wen or Govind. Wen does not disclose any multiband transmitter, receiver, or transceiver; its architecture consists of multiple single-band transceivers, each hard-wired to a different feed point on a multi-feed antenna. EX1004, ¶¶[0031], [0039]. There is nothing in Wen for Ella's tuner to be "associated with" as a multiband device. While Govind discusses multiband RFIC topologies (EX1008, 2:9-20), Govind does not disclose any tuner at all, much less a tuner associated with a multiband transceiver and configured to tune a multiband antenna across multiple bands. Therefore, no reference provides **both** the claimed multiband RF device **and** a tuner associated with the multiband RF device, as claim 10 expressly requires.

Petitioner's theory that a POSITA would "substitute multiband transceivers for Wen's transceivers" (Pet. 37) and then "use a tuner" from Ella (*id.*, 22-25, limitation 4[a]) fails for an additional reason: inserting a single multiband transceiver into Wen would dismantle Wen's fundamental architecture, which depends on multiple single-band transceivers tied to spatially separated feed points. Replacing Wen's single-band transceiver array with a single multiband RF device would eliminate the very structure Wen teaches. The further addition of Ella's antenna-side tuner only compounds the incompatibility; nothing in Wen, Govind, or Ella suggests integrating a multiband RF chain with a tuner to perform simultaneous multi-band matching as required by claim 10.

Finally, Petitioner mischaracterizes Ella as matching "in a plurality of different bands simultaneously." Pet. 37. Ella's algorithm measures a parameter (*e.g.*, VSWR) at a single frequency in the first band and selects one ratio of reactance values depending on whether the second band is higher or lower. EX1005, 5:64-6:32, 6:54-7:8. Ella does not disclose concurrent or simultaneous multi-band matching, nor any tuning performed for a multiband transceiver. Ella, therefore, does not teach—and cannot be combined with Wen and Govind to yield—the required tuner "matching said at least one multiband antenna to the said at least one multiband transmitter, receiver, or transceiver in a plurality of different bands simultaneously."

b. Ground VII: Obviousness (Rubinshteyn and Ella)

- i. The cited references do not teach or suggest “at least one multiband transmitter, receiver or transceiver[.]”

Rubinshteyn describes only a single transmitter and a single receiver, each connected to the antenna through a duplexer. EX1006, ¶[0022]. Neither is disclosed or described as a “*multiband*” device—*i.e.*, designed to operate in several distinct frequency bands. Instead, the transmitter and receiver are single-band components. There is no tuning of any off-antenna circuitry for multiband operation in Rubinshteyn. Ella does not disclose any transmitter, receiver, or transceiver, let alone a multiband device. Thus, neither reference teaches or suggests “at least one multiband transmitter, receiver or transceiver” as claim 10 requires.

- ii. The cited references do not teach or suggest a “tuner associated with” the multiband component.

Rubinshteyn’s tuning circuits are located on the antenna side and are not “associated with” any transmitter, receiver, or transceiver—much less a multiband device. The controller in Rubinshteyn operates antenna-side tuning elements, not a tuner linked to a multiband transmitter, receiver, or transceiver. EX1006, ¶¶[0028]–[0036]. Ella’s tuner is connected between the antenna and a transceiver, but is not associated with a multiband device as claim 10 requires. The claimed architectural relationship—a tuner associated with a multiband transmitter,

receiver, or transceiver—is absent from both references.

- iii. The cited references do not teach or suggest a Tuner “matching . . . in a plurality of different bands simultaneously[.]”

Claim 10 requires that the tuner matches the multiband antenna to the multiband transmitter, receiver, or transceiver “in a plurality of different bands simultaneously.” Rubinshteyn’s antenna is frequency-agile, but only operates in a selected band at a time; its tuning circuits do not provide simultaneous matching across multiple bands. Ella’s tuner can optimize a dual-band antenna, but does not match a multiband antenna to a multiband device in multiple bands at once. EX1005, 7:30–37. Neither reference, alone or in combination, teaches or suggests simultaneous matching as claim 10 requires.

4. **Independent Claim 13 of the ’763 Patent**

a. Ground III: Obviousness (Wen, Ella, and Govind)

Claim 13 recites a wireless portable device in which at least one component (transmitter, receiver, or transceiver) “transmits or receives electromagnetic energy *simultaneously* at two or more of said plurality of particular frequency bands,” or two or more components do so *simultaneously*. EX1001, 12:3-9 (emphasis added). Petitioner’s Ground III fails to establish that the prior art teaches or renders obvious this expressly simultaneous operation—individually or in combination.

- i. Wen does not disclose simultaneous multiband operation.

Wen does not disclose or suggest the simultaneous multiband operation claim 13 requires. Petitioner solely relies on Wen for this element (Pet., 39-40), yet Wen's architecture is fundamentally sequential, not concurrent. Wen employs multiple single-band transceivers, each hardwired to a specific feed point and designed to operate in only one frequency band. EX1004, ¶¶[0031], [0039]. Wen's controller "selectively operates" transceivers, activating one transceiver at a time to use the common antenna. *Id.*, ¶[0031]. This selection mechanism is expressly intended to manage which single-band transceiver is active, not to enable simultaneous multiband transmission or reception. Nothing in Wen discloses or suggests that any transmitter, receiver, or transceiver transmits or receives in two or more frequency bands simultaneously, as claim 13 requires. Wen's transceivers remain single-band and feed-point-specific, and Wen contains no disclosure of concurrent operation across multiple bands.

Petitioner's reliance on Wen's description of feed points capable of resonating at multiple frequencies is misplaced. Pet., 34; EX1004, ¶¶[0039]–[0040]. The physical ability of a feed point to support multiple resonant frequencies does not convert a single-band transceiver into a component capable of simultaneous multiband transmission or reception. Claim 13 requires simultaneous

RF operation, not merely antenna structures that can be used at different frequencies.

Petitioner further attempts to equate Wen's use of the phrase "at the same time" with simultaneous multiband RF operation. But Wen expressly explains that "at the same time" does "not mean start and/or stop time are synchronized," but rather "merely that there is some overlap in time." *Id.*, ¶[0031]. That definition encompasses staggered or switched operation rather than true simultaneous multiband transmission or reception.

Accordingly, Wen discloses a switched, single-band architecture, not the simultaneous multiband operation claim 13 requires.

- ii. Neither Wen nor Govind supplies simultaneous multiband operation.

Petitioner cites no disclosure in Wen, Govind, or any other reference (*e.g.*, Ella) of any transmitter, receiver, or transceiver that operates simultaneously in two or more frequency bands. Wen is fundamentally switched as described above. Ella is not relevant to simultaneity and Petitioner does not rely on Ella as disclosing simultaneity (*see* Pet., 39-40). Govind's multiband RFIC topologies are never described as supporting concurrent multi-band transmission or reception.

Petitioner nevertheless argues that a POSITA would substitute a multiband transceiver from Govind into Wen. Pet., 39-40; EX1003, ¶¶141-142. But Wen's

architecture is built around multiple single-band transceivers, each tied to a distinct feed point. EX1004, ¶¶[0031], [0039]. Nothing in Wen permits a single transceiver to operate across multiple feeds or multiple frequency bands at once, and nothing in Govind discloses a transceiver capable of simultaneous multi-band operation. Govind teaches that a transceiver may support operation in multiple frequency bands, but Govind does not disclose or suggest simultaneous transmission or reception in more than one band. Petitioner’s theory implicitly treats Govind’s “multiband” capability as if multiband capability enabled concurrent multiband operation, because only simultaneous operation could satisfy the asserted claim requirements when combined with Wen’s fixed, feed-point architecture. Nothing in Govind or Wen supports that interpretation. Substituting a multiband transceiver into Wen would require discarding Wen’s entire operating principle.

- iii. Petitioner’s attempt to rely on POSITA substitution is circular and legally insufficient.

Petitioner’s allusion to substituting a “multiband transceiver” from Govind into Wen (Pet., 40; EX1003 ¶142) suffers from circular reasoning and cannot supply the simultaneity claim 13 requires. Neither Wen nor Govind discloses any transceiver—single-band or multiband—that transmits or receives in two or more frequency bands simultaneously. Govind teaches only selectable multiband

capability, not concurrent multi-band operation. Substituting a non-simultaneous “multiband” transceiver into Wen necessarily cannot yield a simultaneous multi-band architecture absent hindsight reconstruction. Petitioner assumes the very feature that is missing from both references and offers no teaching, suggestion, or rationale that would lead a POSITA to create a system fundamentally different from Wen’s switched, single-band-per-feed-point design.

iv. Conclusion.

Claim 13 requires simultaneous operation by at least one component across two or more frequency bands. Wen’s architecture is fundamentally switching, not concurrent, and neither Ella nor Govind supplies the missing element or teaches how to achieve simultaneous operation. The Petition’s proposed combination is unsupported by the references, lacks technical motivation, and would not function coherently. Accordingly, Petitioner fails to show that claim 13 would have been obvious under Ground III.

b. Ground VII: Obviousness (Rubinshteyn and Ella)

Claim 13 requires that at least one component (receiver, transmitter, or transceiver) transmits or receives electromagnetic energy simultaneously at two or more of the claimed frequency bands, or that two or more components do so simultaneously. This is a functional requirement at the component level, not merely an antenna capability.

Rubinshteyn discloses a dual-band PIFA antenna that can resonate at two frequencies and includes tuning circuits to select bands. EX1006, ¶¶[0016], [0022], [0028]. While Rubinshteyn's antenna may support two bands, Rubinshteyn's transmitter and receiver paths are each single-band at a time. The duplexer splits signals into separate paths for different bands. *Id.*, ¶[0022]. No disclosure in Rubinshteyn suggests that any single component processes multiple bands concurrently, nor that multiple components each operate simultaneously across two or more bands.

Ella addresses adaptive impedance matching for efficiency across bands. EX1005, 1:46-56. Ella optimizes antenna performance (*id.*, 7:30-37), but does not teach or suggest a receiver, transmitter, or transceiver capable of simultaneous multiband operation. Combining Ella's tuning with Rubinshteyn's antenna still yields single-band components, not the claimed simultaneous multiband functionality.

Petitioner conflates antenna-level dual-band capability with component-level simultaneity by referring to limitations in other claims that do not contain the simultaneity of claim 13. Pet. 72-73 (limitation 13[c] *citing* limitation 6[b] which does not require simultaneous operation), 68 (limitation 6[b] *citing* limitation 4[a] which does not mention “simultaneous” operation), 64 (limitation 4[a]). Thus, the “whereby” clause in claim 13 cannot be satisfied by an antenna resonant in two

bands. The clause requires that the functional operation of the components themselves be simultaneous across multiple bands. Neither reference teaches this, and the Petition offers no reasoned motivation to modify the prior art to achieve simultaneous operation across multiple bands.

Therefore, the combination of Rubinshteyn and Ella fails to disclose or render obvious the “whereby” limitation of claim 13.

5. Independent Claim 17 of the '763 Patent

a. Ground II: Obviousness (Wen and Ella)

Claim 17 is similar to claim 1, but is recited as a component claim requiring “a tuner or a set of tuners or controller or other circuitry configurable to be coupled to at least one antenna and a plurality of transmitters, receivers, or transceivers that operate at one or more frequency bands,” where the antenna is used by the plurality of transmitters, receivers or transceivers in a plurality of different bands and where the antenna is either (a) an actively tuned antenna, or (b) tuned by one or more passive elements which are selected or interconnected using electronic control. EX1001, 12:22-32.

For the reasons set forth above with respect to claim 1, Petitioner has not shown that Wen, alone or in combination with Ella, discloses or renders obvious a tunable antenna as required by claim 17. Section IV.A.1. As explained, Wen’s antenna is a static, multi-feed patch antenna whose operating bands are set by

fixed, design-time geometry, not by any run-time, electronically controlled tuning or matching. EX1004, ¶¶[0034]–[0036], [0039]–[0040]. Wen’s controller merely selects which single-band transceiver is active. Wen’s controller does not control any antenna-side components to change frequency response. *Id.*, ¶[0031]. Nothing in Wen discloses a tuner, any tunable reactance, any active or passive matching network under electronic control, or any circuitry configured to alter the impedance matching behavior of the antenna at run time.

Petitioner’s alternative theory relying on Ella’s single-band adaptive matching network does not cure this fundamental defect. Pet., 22-25 (limitation 4[a] *citing* EX1005 (Ella) at 4:19-29, 4:40-44, 5:54–56, 7:30–33). Ella does not teach or suggest a tunable antenna as claim 17 requires, nor does Ella provide any mechanism for run-time, electronically controlled tuning in the context of Wen’s fixed, multi-feed architecture. *See* Section IV.A.1 *supra*.

Accordingly, for the same reasons stated above for claim 1, Petitioner fails to show that claim 17 would have been obvious over Wen and Ella.

b. Ground VI: Obviousness (Rubinshteyn, Wen, and Ella)

Claim 17 requires “a plurality of transmitters, receivers, or transceivers that operate at one or more frequency bands,” making claim 17 similar to claim 1. The combination of Rubinshteyn and Wen does not teach or suggest this limitation of claim 17, as described above in connection with claim 1. Section IV.A.1.

6. Dependent Claims of the '763 Patent

Petitioner premises its grounds for the dependent claims of the '763 Patent on Petitioner's theories for its independent claims of the '763 Patent. Because Petitioner fails to show that the independent claims of the '763 Patent are invalid under any asserted theory, Petitioner necessarily fails to show that the dependent claims of the '763 Patent are invalid. *Hartness Int'l Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108 (Fed. Cir. 1987) (if an independent claim is nonobvious, a dependent claim is necessarily nonobvious and novel).

B. The Petition Fails to Articulate Well-Reasoned Rational Underpinnings for Motivating the Combinations of the Independent Claims under Grounds II, III, V, VI, and VII

1. Applicable Legal Standard

To institute on an obviousness ground based on a combination of references, Petitioner must demonstrate a reasonable likelihood that Petitioner would prevail by articulating a reasoned rationale underpinning the proposed combination.

Kahn, 441 F.3d at 988; *Dish Network L.L.C. v. TQ Beta, LLC*, IPR2015-01791, Paper 30, 19 (PTAB Jan. 30, 2017). A petition must do more than identify prior art elements and assert that they could be combined. A petition must explain why a POSITA would have been motivated to combine the references in the manner proposed. *In re Magnum*, 829 F.3d at 1378-81. Conclusory assertions, general design goals, or labels such as "simple substitution" or "obvious to try" do not

suffice. *See, e.g., TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d 1352, 1358-59 (Fed. Cir. 2019) (“Conclusory expert testimony does not qualify as substantial evidence.”); *Arendi S.A.R.L. v. Apple, Inc.*, 832 F.3d 1355, 1362 (Fed. Cir. 2016) (“[R]eferences to ‘common sense’ . . . cannot be used as a wholesale substitute for reasoned analysis and evidentiary support[.]”); *In re Nuvasive*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (conclusory statements alone are insufficient articulations of motivation to combine); *Hunting Titan, Inc. v. DynaEnergetics Europe GmbH*, PGR2020-00080, Paper 7, 11 (PTAB Feb. 12, 2021) (petitioner’s reliance “on generalized statements that such [obviousness] combinations would, for instances, be ‘predictable,’ ‘simple substitution,’ application of ‘known techniques,’ and ‘obvious to try’” insufficient to meet burden to justify institution). Petitioner must explain why and how a POSITA would have combined the references in the manner asserted, with a reasonable expectation of success. *Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 994 (Fed. Cir. 2009). Expert testimony may support such a showing, but only if the expert testimony provides independent technical reasoning and does more than merely repeat the Petitioner’s conclusions. *See InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1349-52 (Fed. Cir. 2014).

2. Independent Claim 1

Petitioner’s Grounds I and V fail to teach or suggest all the elements of

claim 1 as described above. Petitioner also fails to show a likelihood that claim 1 would have been obvious under Ground V because Petitioner's asserted motivations for combining Rubinshteyn and Wen lack a reasoned explanation required under 35 U.S.C. § 103.¹

a. Petitioner Asserts Three Purported Motivations for Ground V, None of Which Supplies a Rational Underpinning

Petitioner advances three purported motivations for combining Rubinshteyn and Wen. None supplies a rational underpinning sufficient to support institution.²

i. Petitioner's "simple substitution of known elements" theory is conclusory.

Petitioner's first rationale—that the combination would amount to a "simple substitution of known elements with predictable results" (Pet., 47)—is conclusory and unsupported. Petitioner argues that because single-band and multiband transmitters, receivers, and transceivers were known, a POSITA would have simply replaced Rubinshteyn's single transmitter and receiver with a plurality of

¹ Ground I relies on a single reference—Wen—for claim 1. Pet., 5.

² A fourth argument merely addresses a POSITA's likelihood of success, Pet., 49, which is distinct from, and not a substitute for, a motivation to combine. *See Eli Lilly & Co. v. Teva Pharm. Int'l GMBH*, 8 F.4th 1331, 1344 (Fed. Cir. 2021).

transceivers as disclosed in Wen. *Id.* This characterization, however, glosses over fundamental architectural differences between the references. Rubinshteyn discloses a single-RF-chain architecture comprising a single transmitter, a single receiver, and a duplexer coupled to a tunable antenna. Wen, by contrast, discloses a system in which multiple RF transceivers are coupled to a common antenna through multiple feed points and are selectively operated, including simultaneously.

Petitioner does not explain (i) how Rubinshteyn's single-RF-chain architecture in which a single transmitter and a single receiver are coupled through a duplexer to a single antenna feed would be modified to accommodate multiple RF chains or transceivers as in Wen; (ii) how Rubinshteyn's duplexer or RF signal path would be reconfigured; or (iii) how the control, isolation, and signal-routing issues inherent in Wen's multi-RF-chain architecture would be addressed. Wen's disclosure contemplates multiple RF transceivers coupled to different feed points of a common antenna and, in some embodiments, capable of concurrent operation—an architectural premise absent from Rubinshteyn. Petitioner never explains why modifying Rubinshteyn to adopt the multi-RF-chain, multi-feed architecture in Wen would be a predictable, routine change rather than a system-level redesign. Replacing Rubinshteyn's single-RF-chain architecture with Wen's multi-transceiver architecture is not a like-for-like substitution of known elements.

Instead, replacing Rubinshteyn's single-RF-chain architecture with Wen's multi-transceiver architecture constitutes a fundamental re-architecture of the RF system. Merely labeling that re-architecture as a "simple substitution" does not provide the reasoned analysis required to establish a motivation to combine.

- ii. Petitioner's "obvious-to-try finite options" assertion is unsupported.

Petitioner next contends that single-band and multiband transmitters, receivers, and transceivers were known alternatives and that a POSITA would have been motivated to try a finite number of options. Pet., 47-48. This assertion is unsupported.

First, Petitioner does not identify a finite set of concrete, implementable modifications to Rubinshteyn's disclosed architecture. Petitioner does not explain how many transceivers would be added, how they would be coupled to the antenna, how RF interference or isolation would be addressed, or how simultaneous operation would be achieved.

Second, Petitioner does not explain why a POSITA would have selected the particular configuration asserted in Ground V, as opposed to other possible architectures or design approaches.

Third, Petitioner, for similar reasons, does not explain why a POSITA, starting from Rubinshteyn and guided by Wen, would have reasonably expected

success in arriving at the specific configuration asserted in Ground V. Where a petition does not identify concrete implementation details or explain why the cited references would guide a POSITA toward the particular architecture claimed, a reasonable expectation of success cannot simply be presumed. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). Merely asserting that various design alternatives were known in the abstract does not supply the required rational underpinning, especially where Petitioner fails to provide analysis grounded in the disclosures of Rubinshteyn or Wen explaining why the asserted modification would be expected to succeed.

- iii. Petitioner’s reliance on “analogous art” is not a motivation to combine.

Finally, Petitioner asserts that because Rubinshteyn, Wen, and the ’763 Patent are analogous art, there is a motivation to combine Rubinshteyn and Wen. Pet. 48-49. This bare assertion, however, does not supply a motivation to combine. Whether references are analogous art is a threshold inquiry that determines whether a reference may be considered at all under § 103. *LKQ Corp. v. GM Global Tech. Operations LLC*, 102 F.4th 1280, 1303 (Fed. Cir. 2024) (Lourie, J. concurring) (“[T]he analogous art test is not a test for obviousness. It is a gateway. Determining whether art is analogous is determining what may properly be considered in an obviousness inquiry, not part of the test for what would have been

considered obvious. It is a threshold for qualifying art, not an indicator or obviousness.”). The fact that a reference is analogous art does not provide the required explanation for why a POSITA would combine references, nor does that fact provide a rational underpinning for modifying one reference in view of another.

Petitioner does not explain how the alleged analogousness of Rubinshteyn and Wen would lead a POSITA to redesign Rubinshteyn’s single-transceiver architecture to support multiple simultaneously operating transceivers, nor how analogousness informs any specific design choice relevant to the Challenged Claims. Accordingly, this assertion fails to support Petitioner’s obviousness argument.

b. Petitioner’s Expert Does Not Cure Petition’s Deficiencies

Petitioner’s expert’s declaration (EX1003) does not remedy the failure of the Petition to articulate a reasoned motivation to combine Rubinshteyn and Wen. Rather than supplying additional technical analysis, Dr. Mahon largely repeats the same conclusory assertions set forth in the Petition, using the same legal labels without explaining how a POSITA would have arrived at the asserted combination or why doing so would have been predictable.

With respect to Petitioner’s “simple substitution” rationale, Dr. Mahon asserts—without analysis—that a POSITA could have modified Rubinshteyn to

include a plurality of transmitters, receivers, or transceivers “through a simple substitution of known components” and would have “reasonably expected the combination to succeed.” EX1003 ¶¶162–63, 165. Dr. Mahon’s statements do not address the architectural differences between the references or explain how Rubinshteyn’s disclosed single-RF-chain arrangement (including a transmitter, receiver, and duplexer coupled to a single antenna feed) would be reworked to accommodate Wen’s multi-RF-chain, multi-feed architecture. Nor does Dr. Mahon explain how Rubinshteyn’s RF signal paths, duplexer configuration, control logic, or isolation considerations would be modified to use a multi-RF-chain, multi-feed architecture as in Wen. Dr. Mahon also does not explain why changing Rubinshteyn to use a multi-RF-chain, multi-feed architecture as in Wen would yield predictable results. Simply asserting that redesigning Rubinshteyn to use a multi-RF-chain, multi-feed architecture as in Wen would be “routine” or “trivial” does not supply the missing rationale.

Dr. Mahon’s discussion of an “obvious-to-try” theory likewise parrots the Petition without providing any independent analysis. He asserts that single-band and multiband transmitters, receivers, and transceivers were known alternatives and that a POSITA would have been motivated to choose among a finite number of options. *Id.*, ¶164. But he does not identify a finite set of concrete design choices relevant to Rubinshteyn’s architecture, explain why the particular configuration

asserted in Ground V would have been selected, or analyze why a POSITA would have reasonably expected success in implementing Petitioner's proposed modifications starting from Rubinshteyn and guided by Wen. General statements about the existence of alternatives or design tradeoffs do not establish an obvious-to-try rationale grounded in the cited disclosures.

Finally, Dr. Mahon's assertion that Rubinshteyn, Wen, and the '763 Patent are all directed to multiband wireless devices does not supply a motivation to combine. *Id.*, ¶166. Dr. Mahon does not articulate how the alleged analogousness of the references would lead a POSITA to redesign Rubinshteyn's RF architecture in the manner Petitioner proposes.

Dr. Mahon fundamentally fails to tie his conclusions to the knowledge or skill of the defined POSITA and is effectively indifferent to the level of ordinary skill. Although Dr. Mahon adopts Petitioner's proposed level of ordinary skill (EX1003, ¶53), he does not explain how a POSITA with that education and experience would have known how to implement the asserted "simple substitution," how to redesign Rubinshteyn's RF architecture to incorporate Wen's multi-RF-chain system, or how to select among the purported "finite number" of options. His declaration does not identify any technical principles, standard engineering practices, or foundational training that would guide a POSITA in making the specific modifications Petitioner proposes.

Instead, Dr. Mahon simply asserts—without analysis—that the required changes to Rubinshteyn would have been “simple,” “routine,” or “trivial.” EX1003 ¶¶162–65. But the existence of known components or alternative design approaches does not, by itself, establish how or why a POSITA would have combined them in the particular manner asserted. By failing to explain what knowledge the POSITA would apply, or how that knowledge would lead to the proposed combination, Dr. Mahon’s testimony does not provide the reasoned, POSITA-grounded analysis required to support a motivation to combine. *See In re Rouffet*, 149 F.3d 1350, 1357-58 (Fed. Cir. 1998).

In short, Dr. Mahon’s declaration does not add any substantive reasoning to bridge the gaps in Petitioner’s motivation-to-combine analysis. Dr. Mahon merely parrots Petitioner’s conclusory allegations as Dr. Mahon’s own opinions. That *ipse dixit* testimony does not cure Petitioner’s failure to provide a reasoned explanation for combining Rubinshteyn and Wen and cannot support institution. *See, e.g., TQ Delta*, 942 F.3d at 1358-59.

c. The Only Apparent Rationale Is Impermissible Hindsight

Because Petitioner does not articulate a motivation to combine grounded in the prior art or the knowledge of a POSITA, and because the expert testimony does not supply the missing analysis, the only apparent reason for combining Rubinshteyn and Wen is knowledge of the Challenged Claims themselves.

Obviousness, however, may not be established by reasoning backward from the claimed invention. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

Reliance on hindsight does not satisfy Petitioner's burden to demonstrate a reasonable likelihood of prevailing.

Ground V fails because Petitioner does not articulate a well-reasoned, supported rationale underpinning the proposed combination of Rubinshteyn and Wen. The asserted motivations are conclusory, unsupported by analysis, and reinforced only by expert testimony that merely repeats the Petition's assertions. Petitioner, therefore, fails carry its burden to establish a reasonable likelihood of success, and institution should be denied.

3. Independent Claims 6, 10 and 13

Grounds III and VII fail because Petitioner has not articulated a well-reasoned rationale underpinning the proposed obviousness combinations for independent claims 6, 10 and 13.

a. Ground III: Wen in view of Ella and Govind

In Ground III, the Petition asserts that independent claims 6, 10, and 13 would have been obvious based on a combination of Wen, Ella, and Govind. Pet., 5. To sustain that ground, Petitioner must articulate a reasoned rationale explaining why a POSITA would have modified Wen's disclosed architecture to (i) replace Wen's plurality of single-band transceivers with one or more multiband

transmitters, receivers, or transceivers; (ii) associate a tuner with one or more multiband transmitters, receivers, or transceivers, and control that tuner across multiple bands; and (iii) for claims 10 and 13, achieve simultaneous multiband transmission or reception. Petitioner fails to do so and instead offers a series of high-level, conclusory assertions insufficient to supply the required rational underpinning.

- i. Petitioner's "simple substitution" theory is conclusory and untethered to Wen's architecture.

Petitioner first asserts that multiband transceivers were well known and commercially available prior to the priority date and that replacing Wen's plurality of single-band transceivers with one or more multiband transceivers would have been a "simple substitution of known elements with predictable results." Pet., 30-31; EX1003 ¶111. That conclusory assertion, lacking any analysis or explanation, is insufficient.

Wen's system is not a generic collection of interchangeable RF components. Wen's system is an architecture expressly built around multiple single-band transceivers, each hardwired to a specific feed point of a fixed-geometry, multi-feed antenna, with controller logic premised on selection among Wen's discrete RF chains. EX1004, ¶[0027]. The Petition fails to explain (i) how a multiband transceiver operating across multiple bands would interface with Wen's multi-feed

antenna; (ii) how Wen’s controller would be modified to control a multiband transceiver; and (iii) how the claimed tuner would become “associated with” the multiband device rather than remaining antenna-side. Simply invoking the availability of multiband transceivers does not explain why a POSITA would discard Wen’s chosen architecture or how the proposed substitution would be implemented.

Dr. Mahon’s declaration does not cure this deficiency. Dr. Mahon’s opinion that the substitution would have been “simple” merely restates Petitioner’s conclusion and provides no technical analysis of how Wen’s architecture would be modified, rewired, or re-controlled to accommodate a multiband RF device and associated tuner. EX1003, ¶111. Conclusory substitution language, without explanation, does not constitute a reasoned motivation to combine. *Nuvasive*, 842 F.3d at 1383.

- ii. Wen’s general discussion of device size does not supply a claim-specific motivation.

Petitioner’s next contention, that Wen itself supplies an “express motivation” to combine because Wen discusses market demand for smaller devices and limited antenna space (Pet., 31; EX1003 ¶112), likewise fails. “[K]nowledge of a problem and motivation to solve it are entirely different from motivation to combine particular references.” *Innogenetics, N.V. v. Abbott Lab ’ys*, 512 F.3d

1363, 1373 (Fed. Cir. 2008). Likewise, design goals such as reduced size and convenience do not, without more, provide a motivation to adopt a particular architectural modification. Wen addresses the size problem by using a common antenna shared among multiple single-band transceivers. Petitioner does not explain why a POSITA, having adopted Wen's solution, would abandon that architecture in favor of a fundamentally different one involving multiband RF devices and associated tuners.

Critically, even if size reduction were assumed to motivate some change, Petitioner never explains how that concern would motivate the specific claim requirements at issue—namely, associating a tuner with a multiband transmitter, receiver, or transceiver and controlling that tuner across multiple bands, or achieving simultaneous multiband operation as claims 10 and 13 require. The asserted motivation is untethered from the claim language and therefore insufficient.

Again, Dr. Mahon's testimony adds nothing beyond repeating Wen's general background discussion. He does not connect Wen's size considerations to the particular architectural changes claims 6, 10, and 13 require. EX1003, ¶112.

- iii. Govind's disclosures of multiband transceivers do not supply a rationale to modify Wen.

Petitioner's assertion that Govind provides a motivation to combine because

Govind discloses multiband transceivers offering advantages such as reduced component count, power savings, and cost reductions (Pet., 30-31; EX1003 ¶113) also fails. That Govind discloses multiband transceivers, and that multiband transceivers may offer generic advantages, does not explain why or how a POSITA would integrate Govind's transceivers into Wen's fixed multi-feed architecture. Govind does not address Wen's use of multiple hardwired feed points, Wen's controller logic for selecting among discrete RF chains, or the claimed requirement that a tuner be associated with and controlled for a multiband RF device. Petitioner never explains how Govind's RF components would replace Wen's transceivers, how Ella's antenna-side tuning would be repositioned or re-architected to satisfy the association requirement of the claim, or how the resulting system would achieve the claimed functionality.

Petitioner's reliance on Govind's stated advantages amounts to hindsight reasoning—identifying desirable features after the fact and asserting that a POSITA would have combined the references to obtain them. Absent an explanation grounded in the teachings of the prior art and the contemporaneous understanding of a POSITA, *post hoc* advantages do not supply a reasoned motivation to combine. *Halliburton Energy Servs., Inc. v. U.S. Well Servs., LLC*, IPR2023-00558, Paper 27, 59-60 (PTAB Aug. 12, 2024).

- iv. Petitioner’s “analogous art” discussion does not supply a motivation to combine.

Petitioner additionally asserts that Wen, Ella, Govind, and the ’763 Patent are analogous art. Pet., 32; EX1003, ¶114. Even if true, that assertion does not articulate a sufficient motivation to combine. Whether references are analogous art addresses what references may be considered, not why a POSITA would have combined them in the particular manner required by the claims. *LKQ Corp.*, 102 F.4th at 1303. Petitioner improperly treats the mere fact that Wen, Ella, Govind, and the ’763 Patent might be classified as analogous as a substitute for a sufficient motivation to combine.

- v. Dr. Mahon does not supply missing rationales.

Petitioner relies heavily on Dr. Mahon to support all three asserted motivations to combine. Pet., 30-33. Dr. Mahon, however, does not provide independent technical reasoning. EX1003, ¶¶109-15. He does not explain (i) how Wen’s architecture would be modified to incorporate multiband RF devices; (ii) how a tuner would become associated with multiband RF devices; or (iii) how simultaneous multiband operation would be achieved. Instead, Dr. Mahon’s opinions parrot Petitioner’s assertions nearly verbatim, which does not cure the Petitioner’s failure to articulate a reasoned rationale underpinning the proposed combination. 37 C.F.R. § 42.65; *TQ Delta*, 942 F.3d at 1358.

- vi. The only apparent motivation is impermissible hindsight.

In sum, Petitioner offers as rational motivations to combine only (i) generic assertions about the availability of multiband components; (ii) abstract design goals such as size reduction; and (iii) *post hoc* advantages identified in Govind. None explains why a POSITA would have modified Wen in the specific ways claims 6, 10, and 13 require. Because the Petition fails to articulate a well-reasoned motivation to combine Wen, Ella, and Govind, the only apparent reason for the proposed combination is impermissible hindsight reconstruction. *KSR*, 550 U.S. at 421 (hindsight is improper).

b. Ground VII: Rubinshteyn in view of Ella

As with Ground V, Ground VII fails because Petitioner does not articulate a well-reasoned, supported motivation to combine the cited references. Petitioner merely incorporates the motivations asserted for Ground VI and asserts—without analysis—that the motivations of Ground VI apply equally to Ground VII, Pet. 68, which does not satisfy Petitioner’s burden under § 103.

- i. Petitioner asserts no independent motivation for Ground VII.

Petitioner’s motivation to combine for Ground VII consists of *a single sentence* asserting that a POSITA would have been motivated to add a tuner and controller, as taught by Ella, to Rubinshteyn’s device, with a citation directing the

reader to Section XIII.A (Ground VI). Pet., 68. Petitioner does not identify any motivation specific to combining Rubinshteyn and Ella alone, nor does Petitioner explain how the asserted motivations for a different three-reference combination in Ground VI (Rubinshteyn, Wen, and Ella) translate to Ground VII. Petitioner must articulate a motivation to combine or the particular combination asserted, not import a motivation wholesale from a different ground involving different references and different architectural premises. Petitioner's failure to articulate a Ground VII-specific rationale alone counsels denying institution. *See* 35 U.S.C. § 312(a)(3).

- ii. Petitioner's reliance on "known tuners" is conclusory and architecturally untethered.

Even if the motivations asserted for Ground VI are considered, they do not supply a rational underpinning for Ground VII. Petitioner first asserts that tuners were well known and commercially available, and that adding a tuner to Rubinshteyn would have entailed nothing more than the use of a known technique to improve similar devices. Pet. 60-61; EX1003, ¶191. As described above for Ground V, this type of assertion is conclusory and insufficient.

Rubinshteyn discloses a single-RF-chain architecture comprising a single transmitter, a single receiver, and a duplexer coupled to a tunable antenna, with tuning circuits located on the antenna side. Petitioner does not explain why a

POSITA would have added an additional tuner “associated with” Rubinshteyn’s transmitter, receiver, or transceiver—much less how doing so would yield the specific tuner-association and control relationships claims 6, 10, and 13 require. Simply noting that tuners exist and are used for impedance matching does not explain why the antenna-side tuning architecture disclosed in Rubinshteyn would be modified, duplicated, or relocated in the manner the claims require.

Dr. Mahon does not fill this gap. Dr. Mahon’s assertion that adding a tuner would have involved “routine engineering” (EX1003, ¶194) merely restates Petitioner’s conclusion and does not analyze how Rubinshteyn’s RF signal path, duplexer configuration, or control scheme would be modified. Dr. Mahon’s simplistic analysis also fails to address why the required changes to Rubinshteyn would be predictable rather than a system-level redesign.

- iii. Ella’s disclosed advantages do not supply a motivation to modify Rubinshteyn.

Petitioner asserts that Ella provides “express motivations” to combine, because Ella discloses advantages associated with adaptive antenna tuning, including improved efficiency and optimization across two resonant bands. Pet., 62-63; EX1003, ¶192. As explained above for Ground V, reliance on generalized advantages does not supply a reasoned motivation to combine.

Ella’s tuning apparatus is an antenna-side impedance-matching solution.

Petitioner does not explain why a POSITA would have integrated Ella's tuning apparatus into Rubinshteyn's already-tuned antenna architecture, nor how doing so would result in a tuner "associated with" a transmitter, receiver, or transceiver as claims 6, 10, and 13 require. Nor does Petitioner explain how Ella's apparatus would be adapted to support the claimed multiband and simultaneous-operation requirements (claims 10 and 13) when Rubinshteyn itself employs only a single transmitter and receiver.

Absent an explanation grounded in the teachings of the prior art or the contemporaneous understanding of a POSITA, Petitioner's asserted advantages merely reflect the benefits of the Challenged Claims themselves and do not constitute a motivation to combine.

- iv. Petitioner's "analogous art" assertion is not a motivation to combine.

Petitioner makes another misplaced "analogous art" argument for Ground VI and, by incorporation, Ground VII. Pet., 63. As described above, whether references are analogous art is a threshold inquiry that determines what references may be considered and does not provide a sufficient motivation for why a POSITA would have combined them in a particular manner. *LKQ Corp.*, 102 F.4th at 1303. Petitioner does not explain how the alleged analogousness of Rubinshteyn and Ella would lead a POSITA to modify Rubinshteyn's architecture to satisfy the specific

requirements of claims 6, 10, and 13.

- v. Dr. Mahon does not cure the deficiencies of the Petition.

As with the other grounds, Dr. Mahon does not remedy Petitioner's failure to articulate a reasoned motivation to combine. Dr. Mahon's testimony mirrors Petitioner's assertions regarding known tuners, generalized advantages, and routine engineering without analyzing how a POSITA would have implemented the proposed modifications starting from Rubinshteyn's disclosed architecture. EX1003, ¶¶191-94. He does not address the architectural incompatibilities, the required tuner-association relationships, or the simultaneous multiband operation that claims 10 and 13 require.

- vi. The only apparent rationale is impermissible hindsight.

Because Petitioner fails to articulate a Ground VII-specific motivation to combine, and because the motivations imported from Ground VI are conclusory and untethered to Rubinshteyn's architecture, the only apparent reason for combining Rubinshteyn and Ella in the manner asserted is knowledge of the Challenged Claims themselves. Hindsight reasoning does not satisfy Petitioner's burden to demonstrate a reasonable likelihood of prevailing and the Board should deny institution as to Ground VII. *KSR*, 550 U.S. at 421 (hindsight is improper).

4. Independent Claim 17

Claim 17 requires a wireless device component comprising “a tuner or a set of tuners or controller or other circuitry” configurable to be coupled to at least one antenna and a plurality of transmitters, receivers, or transceivers that operate in one or more frequency bands, where the antenna is used by that plurality of transmitters, receivers, or transceivers in a plurality of different bands, and where the antenna is either actively tuned or tuned by passive elements that are electronically selected or interconnected. EX1001, 12:22-32. Petitioner fails to articulate a motivation explaining why a POSITA would have modified the references for both Ground II (Wen in view of Ella) and Ground VI (Rubinshteyn in view of Wen and Ella) to arrive at the invention of claim 17.

a. Ground II: Wen in view of Ella

Petitioner fails to articulate under Ground II a well-reasoned motivation, with a rational underpinning, for combining Wen and Ella to arrive at the invention of claim 17.

i. Petitioner’s reliance on the general availability of tuners is conclusory.

Petitioner first asserts that tuners were well known and commercially available, and that adding a tuner to Wen’s device would have entailed nothing more than applying a known impedance-matching technique to improve a similar device. Pet., 20-21; EX1003, ¶87. As explained above in connection with Ground

III, the mere existence or availability of a component does not supply a motivation to integrate that component into a particular prior art architecture in a manner that satisfies the claim.

Wen's disclosed system is architected around a fixed-geometry, multi-feed antenna used by a plurality of single-band transceivers, each operating at a respective frequency band determined by the physical design of the antenna. EX1004, ¶¶[0027], [0038]. Wen's controller selects among transceivers, and does not control any antenna-side or transceiver-side tuning circuitry. *Id.* Petitioner fails to explain (i) why a POSITA would have added a tuner to Wen's system; (ii) where that tuner would be placed; (iii) how the tuner would interact with Wen's controller and transceivers; and (iv) how the tuner would result in an antenna being "used by" the plurality of transmitters, receivers, or transceivers in a plurality of different bands in the manner claim 17 requires.

Dr. Mahon adds no analysis beyond repeating that tuners were known and used for impedance matching. EX1003 ¶87. Dr. Mahon fails to explain why a POSITA would have modified Wen's particular architecture and how modifying Wen's architecture to include a tuner would satisfy the specific structural and functional relationships claim 17 recites.

- ii. Ella's disclosed advantages do not supply a claim-specific motivation.

Petitioner next asserts that Ella provides “express motivations” to combine because Ella discloses advantages associated with adaptive antenna tuning, including improved efficiency and optimization across two resonant frequency bands. Pet., 21; EX1003 ¶88. This argument suffers from the same defect identified above with respect to Ground III. Petitioner's argument relies on *post hoc* advantages rather than a reasoned explanation grounded in the teachings of the prior art or the contemporaneous understanding of a POSITA.

Ella discloses an antenna-side impedance-matching apparatus designed to reactively compensate for changes in antenna impedance. EX1005, 7:20-28. Petitioner, however, fails to explain why a POSITA would have integrated Ella's tuning apparatus into Wen's fixed multi-feed architecture, which already addresses multiband operation through static antenna geometry and discrete single-band transceivers. Nor does Petitioner explain how Ella's antenna-side tuning apparatus would be configured so that Wen's antenna is “used by” a plurality of transmitters, receivers, or transceivers in a plurality of different bands, as claim 17 requires.

Importantly, Petitioner's argument merely identifies potential benefits—efficiency, signal strength, and optimization—and never explains why Wen's disclosed solution would be modified in favor of Ella's, or how that modification

would be implemented within Wen’s architecture. Absent an explanation, the asserted advantages merely describe the benefits of the claimed invention itself and do not supply a reasoned motivation to combine.

- iii. Petitioner’s “analogous art” discussion does not supply a motivation to combine.

Petitioner further asserts that Wen, Ella, and the ’763 Patent are analogous art. Pet., 21-22. As explained above, whether references are analogous art addresses only whether they may be considered together, not why a POSITA would have combined them in the specific manner claim 17 requires, and does not cure the absence of a reasoned rationale. *LKQ Corp.*, 102 F.4th at 1303.

- iv. Petitioner’s reliance on a reasonable expectation of success does not cure the defect.

Finally, Petitioner asserts that a POSITA would have reasonably expected the Wen–Ella combination to succeed, because tuners were well known and could be added using routine engineering. Pet., 22; EX1003 ¶90. As explained above, a reasonable expectation of success cannot substitute for a missing motivation to combine. Petitioner never articulates how Wen’s architecture would be modified to incorporate Ella’s tuning apparatus in a way that satisfies the requirements of claim 17, and conclusory assertions of “routine engineering” do not supply the missing rationale. *Nuvasive*, 842 F.3d at 1383

- v. The only apparent motivation is impermissible hindsight.

In sum, Petitioner relies on the general availability of tuners, abstract performance benefits identified in Ella, and conclusory expert testimony.

Petitioner does not articulate a reasoned explanation grounded in the teachings of the prior art or the contemporaneous understanding of a POSITA for why the architecture disclosed in Wen would have been modified to include the specific tuner-antenna-plurality relationship recited in claim 17. Absent such an explanation, the proposed combination rests on impermissible hindsight reconstruction.

b. Ground VI: Rubinshteyn in view of Wen and Ella

Petitioner asserts in Ground VI that claim 17 would have been obvious based on a combination of Rubinshteyn, Wen, and Ella. Pet., 5. Petitioner, however, does not articulate for Ground VI any motivation to combine that is materially different from the motivations already asserted—and rejected—above for Grounds V and VII. Instead, Ground VI simply repackages the same conclusory rationales previously advanced for combining Rubinshteyn with Wen and Ella.

As explained above in connection with claim 1 under Ground V and claims 6, 10, and 13 under Ground VII, Petitioner fails to articulate a reasoned rationale explaining: (i) why a POSITA would have modified Rubinshteyn's disclosed

single-RF-chain architecture to incorporate Wen's plurality of transmitters, receivers, or transceivers; (ii) why a POSITA would have further modified Rubinshteyn's single-RF-chain architecture to associate a tuner and controller with Rubinshteyn RF components as asserted; (iii) how the modifications to Rubinshteyn would be implemented; (iv) why the modifications would be predictable rather than a system-level redesign; and (v) how the modifications would yield the specific architectural relationships required by the Challenged Claims.

Claim 17 does not alter or add to this analysis. Like the other challenged independent claims, claim 17 requires a wireless device component comprising tuner or controller circuitry configured to be coupled to at least one antenna and a plurality of transmitters, receivers, or transceivers operating in multiple frequency bands, with the antenna used by that plurality across a plurality of different bands, and with tuning accomplished through active tuning or electronically controlled passive elements. The requirements of claim 17 rest on the same architectural premises discussed above with respect to the other independent claims—premises that Petitioner never justifies with reference-specific analysis. Petitioner fails to explain why a POSITA would have been motivated to combine Rubinshteyn, Wen, and Ella to arrive at the configuration of claim 17 and why a POSITA would have reasonably expected success in making the proposed combination.

Petitioner's reliance on generalized assertions regarding known components, abstract performance benefits, and analogous art (Pet., 61-64) does not cure this defect, for the reasons explained above. Nor does Dr. Mahon add substantive analysis to bridge the gaps in Petitioner's motivation-to-combine theory. EX1003, ¶¶189-94. Instead, Dr. Mahon's testimony repeats the same conclusory assertions already addressed and rejected.

Accordingly, for the same reasons set forth above with respect to Grounds V and VII, Petitioner fails to articulate a well-reasoned, supported motivation to combine Rubinshteyn, Wen, and Ella for claim 17. The only apparent rationale for the proposed combination is impermissible hindsight reconstruction.

5. Dependent Claims

Because Petitioner has not established a motivation to combine sufficient to render any independent claim obvious, Petitioner also has not met its burden to show that claims depending from the independent claims of the '763 Patent would have been obvious. *Hartness*, 819 F.2d at 1108.

V. CONCLUSION

For the foregoing reasons, the Board should not institute *inter partes* review.

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME
LIMITATION, TYPEFACE REQUIREMENTS, AND TYPE STYLE
REQUIREMENTS**

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising **13,344** words, as counted using the Microsoft Word software that was used to prepare this paper, excluding the parts exempted by 37 C.F.R. § 42.24(a), (b).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft Word 2016 in 14-point Times New Roman.

Date: January 7, 2026

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CERTIFICATION OF SERVICE

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