

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

UNILOC 2017 LLC,
Patent Owner.

IPR2020-00396
Patent 6,980,522 B2

Before KRISTEN L. DROESCH, DAVID C. McKONE, and
SHEILA F. McSHANE, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Terminating Proceeding as to Claim 6
Determining All Remaining Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background

We have authority to hear this *inter partes* review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner establishes by the preponderance of the evidence that claims 7 and 8 (“remaining challenged claims”) of U.S. Patent No. 6,980,522 B2 (Ex. 1001, “’522 Patent”) are unpatentable.

B. Related Matters

The parties indicate that claims 1–9 of the ’522 Patent were the subject of two petitions filed by Samsung Electronics America, Inc., (“Samsung”) in IPR2020-00045 and IPR2020-00046. *See* Pet. 48; PO Resp. 9. *Inter partes* review was instituted in IPR2020-00045 challenging claims 6–8, but the proceeding was terminated following settlement. *See* IPR2020-00045, Papers 6, 10. Institution of review was denied in IPR2020-00046 challenging claims 1–5 and 9. *See* IPR2020-00046, Paper 6. Claims 1–5 and 9 of the ’522 Patent were also the subject of a petition filed by Petitioner in IPR2020-00397 (*see* Pet. 3, 49; PO Resp. 9–10), however, institution of review was denied (*see* IPR2020-00397, Paper 11).

The parties indicate the ’522 Patent has been the subject of litigation in multiple cases. *See* Pet. 47; PO Resp. 9–10; Paper 3, 2. The parties indicate that the district court in *Cisco Sys. Inc. v. Uniloc USA Inc.*, Civil Action No. 3:18-cv-04991 (N.D. Cal.) ruled that claim 6 is invalid under 35 U.S.C. § 101. *See* Pet. 48 (citing Ex. 1013); PO Resp. 10. The judgment was affirmed by the Federal Circuit on appeal in *Cisco Sys., Inc. v. Uniloc*

2017 LLC, 813 F. App'x 495 (Fed Cir. 2020), and all appeals are exhausted. PO Resp. 10; Paper 30, 1; Paper 31, 1; Ex. 3001.

C. Procedural History

Google LLC (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 6–8 of the ’522 Patent. Paper 1 (“Pet.”). Petitioner relies on a Declaration of Stuart Lippoff (Ex. 1004) to support its Petition. Pursuant to 35 U.S.C. § 314, we instituted trial on August 3, 2020, as to all of the challenged claims of the ’522 Patent (Paper 11, “Institution Decision” or “Dec.”). After institution of trial, Patent Owner filed a Response (Paper 16, “PO Resp.”), to which Petitioner filed a Reply (Paper 19, “Reply”), to which Patent Owner filed a Sur-reply (Paper 20, “Sur-reply”).

Oral argument was held on May 3, 2021. A transcript of the oral argument is included in the record. Paper 29 (“Tr.”).

Following oral argument, we issued an Order (Paper 28) requesting the parties brief whether the Board may or must terminate or dismiss in-part trial with respect to claim 6 without rendering a final written decision regarding the patentability of that claim because claim 6 was ruled invalid under 35 U.S.C. § 101, with all remaining appeals exhausted. In response to the Order, Patent Owner “requests that the Board terminate this IPR as to claim 6 without rendering a final written decision” as to that claim. Paper 31, 3. Petitioner does not oppose the termination and dismissal as to claim 6, so long as a final written decision is issued with respect to claims 7 and 8. Paper 30, 1, 5.

Accordingly, the Petition as to claim 6 is *dismissed* as moot¹ and trial as to claim 6 is *terminated*.

D. The '522 Patent (Ex. 1001)

The '522 Patent relates to a plurality of stations capable of forming an ad-hoc radio communications network, for example, a network using Bluetooth. *See* Ex. 1001, 1:4–6. A station includes an antenna for transmitting and receiving radio signals on a communication channel, a digital controller unit comprising a link baseband controller, a microprocessor, and an interface unit. *See id.* at 2:42–48, Fig. 2. The interface unit comprises hardware and software for interfacing the station to a host device. *See id.* at 2:57–59.

To overcome a problem encountered in an ad-hoc network when a station having an inefficient antenna operates as a master, the '522 Patent discloses ranking each station in terms of its antenna performance, with the station having the best antenna ranking becoming the master. *See* Ex. 1001, 2:63–3:14. “The antenna ranking can be determined under static conditions, or it may be adjusted dynamically depending on the local environment of a station [], for example based on measured VSWR [voltage standing wave ratio] or some other signal quality measure.” *Id.* at 3:15–18. Other factors may be taken into account in the ranking instead of, or in addition to, antenna performance. *Id.* at 4:34–37. For example, a station having access

¹ Although we dismiss the Petition as to claim 6, we still consider the substance of the Petition addressing the limitations of claim 6 because the remaining challenged claims 7 and 8 depend from claim 6 and therefore incorporate the limitations of that claim.

to electricity instead of a battery might be more suitable as a master due to the extra power requirements for the master role. *See id.* at 4:38–42.

The stations in an ad-hoc network may determine their antenna rankings relative to one another to choose the optimum master station. *See* Ex. 1001, 3:20–23. To compare rankings, the master station requests each of the other stations to provide their rankings using standard Bluetooth communication protocols. *See id.* at 3:25–28. If the master station determines that its ranking is lower than one of the slave stations, the master station hands over its master role to that station using Bluetooth standard methods. *See id.* at 3:28–32, 3:67–4:3. Because of the nature of an ad-hoc network, handover of the master function from one station to another needs to be possible as new stations join the network. *See id.* at 3:33–35, 3:57–4:3, Fig. 3. It is also desirable to enable handoff of the master function to mitigate effects of position dependent fading. *See id.* at 3:35–37.

E. Illustrative Claims

Dependent claims 7 and 8 are the only claims remaining in the trial. Claims 7 and 8, along with independent claim 6 from which each claim depends, are reproduced below:

6. A method of operating an ad-hoc radio communication system having a plurality of stations formed into at least one network, the method comprising the step of:
 - determining a master/slave rank of each station in the network representative of the station's suitability for acting as master in the network using antenna performance characteristics of each station in view of the antenna's local environment; and enabling a station with the highest rank to be master.

7. The method as claimed in claim 6, characterised by determining the performance of the antenna means dynamically.

8. The method as claimed in claim 6, characterised by determining the rank of a station depending on its access to mains power.

Ex. 1001, 6:4–20.

F. Asserted Ground of Unpatentability and Asserted Prior Art

Petitioner challenges the patentability of claims 7 and 8 on the following ground:

Claims Challenged	35 U.S.C. §	Reference(s)
7, 8	103(a)	Morris ² , Hulyalkar ³ , and Sugaya ⁴ .

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art at the time of the invention “would have held a Bachelor’s degree in Computer Engineering, Electrical Engineering, Computer Science, or equivalent training, and would have roughly five years of experience working with ad-hoc communication networks.” Pet. 13 (citing Ex. 1004 ¶ 48). Patent Owner does not dispute Petitioner’s definition of a person of ordinary skill in the art. *See generally* PO Resp. We adopt Petitioner’s definition of a

² Ex. 1008, US Patent Publication No. 2003/0149794 A1, published Aug. 7, 2003 (“Morris”).

³ Ex. 1006, WO 99/11081, published Mar. 4, 1999 (“Hulyalkar”).

⁴ Ex. 1007, US Patent No. 6,804,209 B1, issued Oct. 12, 2004 (“Sugaya”).

person of ordinary skill in the art because it is consistent with the level of skill reflected by the '522 Patent Specification and the asserted prior art.

B. Claim Construction

The Board applies the same claim construction standard as the standard applied in federal courts. *See* 37 C.F.R. § 42.100(b) (2020). The claim construction standard used in a civil action under 35 U.S.C. § 282(b) is generally referred to as the *Phillips* standard. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Under the *Phillips* standard, generally words of a claim are given their ordinary and customary meaning. *Phillips*, 415 F.3d at 1312.

*“antenna performance characteristics of each station
in view of the antenna’s local environment”*

Independent claim 6 recites “using antenna performance characteristics of each station in view of the antenna’s local environment.” *See* Ex. 1001, 6:9–11. The terms “antenna performance characteristics” and “antenna performance characteristics of each station in view of the antenna’s local environment” do not appear in the '522 Patent Specification and the claims originally filed in the patent application that issued as the '522 Patent. *See* Ex. 1002, 17–18; *see generally* Ex. 1001. The Applicant added “an antenna performance characteristic of each station” in a first amendment to the application’s claims. *See* Ex. 1002, 107. Subsequently, the Applicant amended the claims to recite “antenna performance characteristics of each station in view of the antenna’s local environment.” *See id.* at 125.

Petitioner contends that “antenna performance characteristics of each station in view of the antenna’s local environment” should be construed as “a measure of signal quality or signal strength of the antenna,” based on

Patent Owner’s proposed constructions in District Court litigation involving the ’522 Patent. Pet. 14–15 (citing Ex. 1013, 7; Ex. 1015, 9–10). Patent Owner did not contest the substance of Petitioner’s proposed construction in its Preliminary Response. *See* Paper 7 (“Prelim. Resp.”) 22–23. For the purpose of the Institution Decision, we adopted Petitioner’s proposed construction, finding it consistent with the ’522 Patent Specification. *See* Dec. 20–21. In the Response, Patent Owner asserts that, based on the claim language, specification, and prosecution history, “antenna performance characteristics of each station in view of the antenna’s local environment” should be construed as “features of the antenna of each station that are in the vicinity of the antenna and affect its performance.” PO Resp. 14; *see id.* at 10, 12.

Turning first to the ’522 Patent claims, Patent Owner asserts that claim 6 recites “‘performance characteristics of the antenna,’ not ‘performance of the antenna.’” *See* PO Resp. 12; Sur-reply 1–2. According to Patent Owner, “[t]he performance of the antenna would comprise only measurements of the antenna’s performance, such as measurements of signal quality. Instead, the claim language includes the term ‘characteristics,’ which relates to the features or qualities of the antenna that affect its performance.” PO Resp. 12; *see also* Sur-reply 2 (“Based on the language of the claim, it must be a feature of the antenna that affects its performance.”).

In its Reply, Petitioner argues that Patent Owner cites no evidence to support its arguments that the inclusion of the term “characteristics” in the phrase “antenna performance characteristics” relates to the features or qualities of the antenna that affect its performance. *See* Reply 4 (quoting PO

Resp. 12). Petitioner argues that Patent Owner “seeks to rearrange the claim language and require ‘antenna characteristics’ rather than the recited ‘performance characteristics’ of the antenna.” *Id.* at 4–5.

Petitioner also points out that claim 7, which depends from claim 6, does not distinguish between antenna performance and antenna performance characteristics because claim 7 “explains that ‘determining a master/slave rank . . . using [the] antenna performance characteristics’ is ‘characteri[z]ed by determining the *performance of the antenna means* dynamically.’”

Reply 7 (quoting Ex. 1001, 6:14–16) (alterations in original). According to Petitioner, in the context of the ’522 patent, this suggests that “antenna performance characteristics” is at least commensurate in scope with the performance of the antenna, based on claim differentiation. *See id.* (citing *Phillips*, 415 F.3d at 1315).

Patent Owner disputes Petitioner’s argument that “antenna performance characteristics” is at least commensurate in scope with the performance of the antenna, based on claim 7. *See* Sur-reply 3. According to Patent Owner, Petitioner “does not explain why it is that claim 7 cannot be read to further limit claim 6 even though claim 6 requires using features of the antenna that affect its performance.” *Id.*

The words of a claim are given their ordinary and customary meaning, which is the meaning the term would have to person of ordinary skill in the art in the context of the claims, the patent, and prosecution history. *See Phillips*, 415 F.3d at 1312–1313. The claims themselves and the context in which a term is used in the claim can be instructive as to the particular meaning of claim terms. *See id.* at 1314. Other claims of the patent can also be valuable sources of enlightenment as to the meaning of the claim term.

See id. The presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim. *See id.* at 1315.

We agree that Patent Owner's proposed construction is flawed because it rearranges the language of claim 6 to require antenna characteristics instead of performance characteristics. Claim 6 recites "antenna performance characteristics" not "antenna characteristics." The term "characteristics" is modified by the term "antenna performance," not just by "antenna." Moreover, Patent Owner does not provide evidence to support its argument that due to the inclusion of the term "characteristics," "antenna performance characteristics" relates to the features or qualities of the antenna that affect its performance. Argument of counsel cannot take the place of objective evidence. *See Gemtron Corp. v. Saint-Gobain Corp.*, 572 F.3d 1371, 1380 (Fed. Cir. 2009) (unsworn attorney argument is not evidence).

Even assuming Patent Owner's unsupported attorney argument is correct, in other words "characteristics" is synonymous with "features or qualities," "antenna performance characteristics" therefore refers to "features or qualities of antenna performance." We also agree that "antenna performance characteristics" recited in claim 6 is at least commensurate in scope with "determining the performance of the antenna means dynamically," recited in claim 7. Stated in other terms, the scope of claim 7 is narrower than the scope of claim 6 and, therefore, "determining the performance of the antenna means dynamically" and generally "performance of the antenna means," cannot be excluded from the scope of claim 6. For

these reasons, the '522 Patent claims do not support Patent Owner's proposed claim construction.

Turning to the '522 Patent Specification and Patent Owner's proffered extrinsic evidence, Patent Owner also asserts that the Specification supports the proposed claim construction. *See* PO Resp. 10–13. Patent Owner reproduces a portion of the '522 Patent Specification addressing “VSWR or some other signal quality measure,” and cites to extrinsic evidence disclosing VSWR as the voltage standing wave ratio. *See id.* at 12 (quoting Ex. 1001, 2:16–18; citing Ex. 2002). According to Patent Owner “VSWR is the voltage standing wave ratio, which corresponds to the impedance matching between the antenna and the radio/transmission line, which is a feature or quality (i.e., characteristic) of an antenna and radio/transmission line, not a performance measurement.” *Id.* (citing Ex. 2002). Patent Owner contends that “[t]he '522 Patent Specification's reference to other signal quality measures is intended to encompass measures like VSWR, which are also based upon the features of the antenna.” *Id.*

Patent Owner further asserts that the proposed construction is supported by the '522 Patent Specification disclosure that each station determines its own rank. *See* PO Resp. 13; *see also id.* at 17 (“[T]he station itself must perform the quality assessment in order to determine its rank using ‘features of the antenna of each station that are in the vicinity of the antenna and affect its performance.’”). More specifically, Patent Owner contends that VSWR is measured at the station because the '522 Patent Specification discloses that each station includes ranking means for determining a rank, the ranking is based on measured VSWR or some other signal quality measure, and the master may request the stations to send their

rankings. *See id.* at 13 (quoting Ex. 1001, 1:34–37; 3:15–17, 3:24–27).

According to Patent Owner, “[l]ooking only at the receiving end to evaluate some quality measure of a path between two stations does not allow one to assess “antenna performance characteristics in view of the antenna’s local environment.” *Id.*; *see also id.* at 17 (“assessing only paths at the receiving end does not provide information about the features of the antenna that affect its performance.”).

In Reply, Petitioner asserts that the ’522 Patent does not distinguish between antenna performance and antenna performance characteristics. *See* Reply 7 (citing Ex. 1001, 3:11–13, 4:35–43). According to Petitioner, “the specification repeatedly describes determining antenna ranking(s) ‘in terms of its antenna performance,’ without mentioning performance characteristics or otherwise suggesting that ‘performance characteristics’ would be of different scope.” *Id.* (citing Ex. 1001, 3:11–13, 4:35–43). Petitioner further contends that Patent Owner’s arguments ignore express teachings of the ’522 Patent because “[t]he ’522 patent’s specification . . . makes clear that its ranking determination can be based not only on measured VSWR . . . , *but also* on ‘some other signal quality measure.’” *Id.* at 4 (quoting Ex. 1001, 3:18); *see id.* at 3–4 (quoting Ex. 1001, 3:11–23).

Petitioner contends that it is unclear how Patent Owner’s position is supported by the ’522 Patent Specification’s disclosure that the rankings are determined at the stations, not the master. *See* Reply 8 (citing PO Resp. 13). Petitioner contends that Patent Owner’s argument that “[l]ooking only at the receiving end to evaluate some quality measure of a path between two stations does not allow one to assess “antenna performance characteristics in view of the antenna’s local environment” “appears to be internally

inconsistent because it simultaneously argu[es] that one must focus on the receiving stations themselves while also stating that one cannot focus on those stations.” *Id.* (quoting PO Resp. 13) (first alteration in original).

Patent Owner asserts that Petitioner “ignores that VSWR can be both a measure of signal quality and also a feature of the antenna relating to its performance.” Sur-reply 2; *see id.* at 4 (similar argument). According to Patent Owner, “[t]he specification does not suggest that *any* measure of signal quality meets the ‘performance characteristics of the antenna’ limitation, and not every example in the specification will meet the claim limitation.” *Id.* at 2; *see id.* at 4 (similar argument).

In determining the ordinary and customary meaning, “the specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitrionics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (1996)). Extrinsic evidence may be useful, but it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence. *Phillips*, 415 F.3d at 1319.

We agree with Petitioner that the ’522 Patent Specification does not distinguish between antenna performance and antenna performance characteristics. Patent Owner’s extrinsic evidence indicates that VSWR is the “voltage standing wave ratio,” which corresponds to the impedance matching between the antenna and the radio/transmission line. *See* Ex. 2002, 1. We, however, do not agree with Patent Owner’s unsupported attorney arguments that: (1) VSWR is only a feature or quality of an antenna; (2) VSWR “is not a performance measurement” and (3) the ’522

Patent disclosure of “other signal quality measures” is intended to encompass measures like VSWR, which are also based upon the features of the antenna. These arguments are not supported by evidence and argument of counsel cannot take the place of objective evidence. *See Gemtron*, 572 F.3d at 1380.

We also agree with Petitioner that the ’522 Patent discloses that each station determines its own ranking, and that the antenna ranking can be based on measured VSWR or some other signal quality measure. We, however, do not agree with Patent Owner’s unsupported attorney argument drawing a distinction between a quality measure at a receiving end of a path between two stations and “antenna performance characteristics in view of the antenna’s local environment.” Again, argument of counsel cannot take the place of objective evidence. *See Gemtron*, 572 F.3d at 1380. In sum, the ’522 Patent Specification and the cited extrinsic evidence (Ex. 2001) does not support Patent Owner’s proposed construction and related assertions that it excludes a measure of signal quality, a performance measurement, and measurements at the receiving end of a path between two stations, yet requires measurement only at the station.

Next, turning to the ’522 Patent prosecution history, Patent Owner contends that its proposed construction is supported by the prosecution history which distinguished Hall’s method based on the determined end-to-end path loss of a signal. *See PO Resp. 13*. According to Patent Owner,

Applicant argued that Hall [(Ex. 2012), a prior art reference applied during prosecution,] teaches a method for determining a geographic location of a mobile unit based on the determined end-to-end path loss of a signal, which is not a teaching of determining performance characteristics of an antenna means in its local environment.”

PO Resp. 8 (quoting Ex. 1002, 147–148); *see also id.* at 17 (“considering only the signal received in a communication path was specifically distinguished during prosecution.”). Patent Owner notes that a Notice of Allowance was issued shortly thereafter. *See id.* at 9.

In its Reply, Petitioner asserts that the Applicant’s arguments during prosecution regarding Hall are ambiguous at best and do not carry the weight Patent Owner seeks to place upon them. *See* Reply 11 (quoting *Phillips*, 415 F.3d at 1317). Petitioner contends that the Applicant’s response to the office action first argued a lack of motivation to combine. *See id.* at 11–12 (quoting Ex. 1002, 148; citing Ex. 1002, 144–150). More specifically, Petitioner contends that the Applicant argued that the other applied prior art reference “failed to disclose considering antenna metrics when determining which station should be master, and thus in its view, an ordinary artisan would not have looked to references like *Hall* and its specific type of antenna performance measure for the combination.” *Id.* at 12 (citing Ex. 1002, 148). According to Petitioner, “[t]he Applicant then argued, *in the alternative*, that *Hall* does not disclose ‘determining the antenna characteristics.’” *Id.* Petitioner points out that the Examiner allowed the claims without providing a reason for allowance. *See id.* (citing Ex. 1002, 151–54).

Petitioner further contends that it is unclear whether the Examiner relied on or considered Applicant’s alternative argument. *See* Reply 12. Petitioner asserts that the record suggests that the Examiner disagreed with the Applicant on whether Hall taught “antenna performance characteristics” because the Examiner relied on Hall’s disclosure of monitoring antenna performance by measuring the VSWR. *See id.* (citing Ex. 1002, 141).

Petitioner points out that the Applicant did not respond to the Examiner's finding regarding Hall's teaching of monitoring antenna performance by measuring VSWR. Petitioner further points out that Patent Owner's position is that VSWR falls within the scope of the challenged claims. *See id.* (citing PO Resp. 10–14). Petitioner further contends that the most likely reason the claims were allowed was based on the Applicant's motivation to combine argument. According to Petitioner, "the prosecution history is not sufficiently clear to override the express statements in the '522 patent's specification that the 'other measures of signal quality,' . . . , satisfy the claimed 'antenna performance characteristics of each station in view of the antenna's local environment.'" *Id.* at 13 (quoting *Kumar v Ovonic Battery Co.*, 351 F.3d 1364, 1371 (Fed. Cir. 2003)).

In the Sur-reply, Patent Owner argues that Petitioner does not cite to where the '522 Patent Specification is alleged to contain such an express statement. *See* Sur-reply 4; *see id.* at 3–4 (quoting Reply 13).

In addition to the claims themselves and the patent specification, the patent prosecution history should be considered. *See Phillips*, 415 F.3d at 1317. The prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. *See id.* However, the prosecution often lacks the clarity of the specification and thus is less useful for claim construction purposes. *See id.* "[A] 'clear and unmistakable' disavowal during prosecution overcomes the 'heavy presumption' that claim terms carry their full ordinary and customary meaning." *Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1095

(Fed. Cir. 2013) (quoting *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323, 1326 (Fed. Cir. 2003)). “Where the alleged disavowal is ambiguous, or even ‘amenable to multiple reasonable interpretations,’” our reviewing court has “declined to find prosecution disclaimer.” *Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016) (quoting *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1359 (Fed. Cir. 2003)).

We find that the Applicant’s arguments addressing certain teachings of Hall do not rise to the level of a clear and unmistakable disavowal of claim scope. As pointed out by Petitioner, the Examiner’s rejection relied upon Hall’s teachings of cellular telephone self-testing capabilities including monitoring antenna performance by measuring VSWR. *See* Ex. 1002, 141 (citing Ex. 1012, 1:19–40). The Applicant’s remarks, relied upon by Patent Owner to support its argument, were non-responsive to the Examiner’s factual findings regarding Hall because the Applicant did not address Hall’s teachings of monitoring antenna performance by measuring VSWR. *See* Ex. 1002, 147–48. Instead, the Applicant presented arguments, inapplicable to the Examiner’s findings, drawing a distinction between non-applied teachings of Hall (i.e., testing end-to-end signal path) and the claimed invention. *See id.* Indeed, counsel for Patent Owner acknowledges that the Applicant does not attempt to distinguish Hall’s teachings of monitoring antenna performance by measuring VSWR. *See* Tr. 19:1–9. Because the prosecution history does not demonstrate a clear and unmistakable disavowal of the scope of “antenna performance characteristics of each station in view of the antenna’s local environment,” the prosecution history does not support Patent Owner’s proposed construction and related

assertions that it excludes determining end-to-end path loss of a signal and assessing signal paths only at the receiving end.

In summary, the claims, the '522 Patent Specification, the prosecution history, and the extrinsic evidence (i.e., Ex. 2002) do not support Patent Owner's proposed construction, and Patent Owner's argued exclusions and requirements based on the proposed construction. Accordingly, we decline to adopt Patent Owner's proposed construction. The term "antenna performance characteristics of each station in view of the antenna's local environment" is given its ordinary and customary meaning, which, consistent with the '522 Patent claims and Specification, where the "performance characteristics" include at least "measured VSWR or some other signal quality measure."

Other Claim Terms and Phrases

As demonstrated in the analysis below, no additional claim terms and phrases require an explicit construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) ("[W]e need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The

question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) if in evidence, so-called secondary considerations.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

D. Unpatentability of Claims 7 and 8

I. Overview of Morris (Ex. 1008)

Morris discloses methods for inter-networking between wireless networks. *See* Ex. 1008, code (57), ¶¶ 1, 6. Morris discloses implementing the invention with the Bluetooth wireless communications protocol. *See id.* ¶ 15. Morris discloses a first piconet comprising a master node and slave nodes, and a second piconet also comprising a master node and slave nodes. *See id.* ¶ 16, Fig. 1. In a preferred implementation, each slave node transmits an advertisement identifying its address, the services it offers, and incorporating the address of all other slave nodes from which advertisements are received by the slave node transmitting a given advertisement. *See id.* ¶ 19. Based on the advertisements received from each slave node, the master node issues an internet management broadcast identifying the participating nodes, the services offered by each node, and the services offered by each external network accessible to one or more slave nodes. *See id.*

When a wireless node desires to participate in the internet management protocol, it ascertains whether any other wireless node is

⁵ The record before us does not include evidence of secondary considerations.

making internet management broadcasts. *See* Ex. 1008 ¶ 20. If an existing internet management broadcast is not detected, the wireless node begins periodic transmission of an initial advertisement identifying its address, the services it offers, a name for the piconet being formed, and specifies the operating mode of the initially participating node. *See id.* Another wireless node receiving the initial advertisement and desiring to participate in the piconet will transmit an acknowledgement message notifying the initial wireless node of its identity and the services it offers. *See id.*

Once the initially participating node has received an acknowledgment message from a newly participating node, the two nodes will negotiate to determine which node should assume the role of periodically issuing the internet management broadcast—that is, which node will become the master node. *See* Ex. 1008 ¶¶ 21, 28. “In one approach, each node is classified into one of a set of predefined operating modes by considering the node’s mobility, power resources, and other parameters bearing upon its suitability to periodically transmit the internet management broadcast.” *Id.* ¶ 21. The node currently functioning as the master node will compare its operating mode to the operating mode of the node from which it receives an advertisement. *See id.* Should the operating mode of that node be deemed preferable, the current master node relinquishes its status by sending a last internet management broadcast that identifies the address of the new master node and instructs the new master node to assume the role of periodically issuing internet management broadcasts. *See id.*

2. Overview of Hulyalkar (Ex. 1006)

Hulyalkar discloses monitoring peer-to-peer links in a wireless network having a centralized control station to determine an optimal

network structure dependent upon the quality of the links. *See* Ex. 1006, 1:3–5, 2:21–23. Hulyalkar discloses an ad-hoc wireless asynchronous transfer mode (ATM) network that may be formed by people around a meeting table with communicating devices for exchanging information. *See id.* at 3:23–25, Fig. 1. As each person enters the meeting or activates their communicating device, the network expands to include the new communications station. *See id.* at 3:25–26. The network also may contract as people leave the meeting or sign off the network. *See id.* at 3:26–27. To form the ad-hoc network, one of the stations must perform the function of a centralized controller. *See id.* at 3:29–30.

Quality assessments by each station can be made by a number of techniques well known to those skilled in the art. *See* Ex. 1006, 5:27–28. For example, as the signal is received, the signal to noise ratio (SNR) can be measured and used as the quality assessment. *See id.* at 5:28–29. Depending on the network environment, quality assessments can occur regularly or on demand. *See id.* at 6:21–22. For example, if it is known that the network is relatively stable, quality assessments may be made only upon the entry or removal of a station from the network, and if the network is dynamic, quality assessments may be made continuously with each transmission. *See id.* at 6:22–26. Depending upon the dynamic nature of the network, alternative methods can be employed to process a number of quality assessments for each path, such as maintaining a running average and updating the running average with each transmission assessment, or replacing a prior assessment with the latest assessment. *See id.* at 6:26–29.

In Hulyalkar, each station will maintain in its local database a quality assessment for each path to each other station. *See* Ex. 1006, 7:7–8. The

centralized controller will periodically poll stations within the network for quality assessments. *See id.* at 7:14–18. Upon receipt of the quality assessments from the stations, the centralized controller stores quality factors from each station and from its local database into a global database, thereby containing a quality assessment for each path within the network. *See id.* at 7:18–22. From these assessments, the centralized controller can assess how well its transmissions are being received by each of the other stations, and can assess whether any station's transmission is being received by each of the other stations with a higher quality measure. *See id.* at 7:22–25.

Any number of techniques may be used to evaluate the network quality assessment measurements to select a preferred station to be utilized as a centralized controller. *See Ex. 1006, 7:26–28.* Organizing quality measurements as a matrix is one technique that may be utilized to select a centralized controller. *See id.* at 7:28–8:13, Fig. 5. Other techniques and algorithms may be used to select a preferable central controller; for example, selecting the station having the highest minimum value, greatest average received quality, greatest mean squared received value, or other characteristic statistic value, or combinations thereof. *See id.* at 8:23–34. In addition to considering the quality of a station's transmission to each of the other stations, the station's reception quality from each of the other stations may be considered. *See id.* at 9:3–9. Selection of a new centralized controller also can be made to be dependent upon the quality assessment of the existing centralized controller, for example, a new controller may not be selected unless and until the existing centralized controller falls below some specified quality criteria. *See id.* at 9:12–15.

3. Overview of Sugaya (Ex. 1007)

Sugaya discloses a method for controlling wireless communication access among a plurality of communications stations via wireless transmission of a control signal from a central control station to a terminal station. *See* Ex. 1007 code (57), 2:14–17. Each of the communication stations includes an antenna for transmitting and receiving. *See id.* at 4:22–27, Fig. 1. A communication station is selected as the central control station if a terminal station communicates with many more stations than the current control station, and a control station change request is transmitted. *See id.* at code (57), 11:11–22, Fig. 9. Sugaya discloses that, in the case where a wireless transmission apparatus configuring its own station as the control station can be driven by a commercially available AC power supply and by a battery, it is not judged a suitable control station when it is driven by the battery. *See id.* at 12:24–30. When the battery service life expires for a battery driven central control station, there is a possibility that a communication network is not constructed. *See id.* at 12:30–33. Sugaya discloses that it is preferable to select a station using an available commercial AC power supply as the central control station. *See id.* at 12:34–35.

4. Analysis

Even though we have terminated this proceeding and dismissed the Petition as to claim 6, claims 7 and 8 contain all the limitations of claim 6 by virtue of dependency. Accordingly, because claims 7 and 8 contain the limitations of claim 6, we assess Petitioner's contentions regarding claim 6.

a. Claim 6: A method of operating an ad-hoc radio communication system having a plurality of stations formed into at least one network

Petitioner contends that Morris teaches “[a] method of operating an ad-hoc radio communication system having a plurality of stations formed into at least one network,” as recited in the preamble of claim 6. *See* Pet. 27–31 (citing Ex. 1004 ¶¶ 211–221). In particular, Petitioner asserts that Morris discloses a wireless network comprising mobile devices that communicate via Bluetooth connections. *See id.* at 27 (citing Ex. 1008 ¶¶ 1, 6, 15, 16, 26); *see also id.* at 30–31 (addressing “a plurality of stations formed into at least one network;” reproducing Ex. 1008, Fig. 1 with annotations; citing Ex. 1008 ¶ 16). According to Petitioner, “[a]lthough every device may act as a master or slave, only one device acts as a master in a network at a time.” *Id.* at 27 (citing Ex. 1008 ¶¶ 16, 19, 26); *see id.* at 28 (reproducing Ex. 1008, Fig. 1 with annotations). Petitioner explains that Morris’s network is ad hoc because devices may enter and leave the network, and the network’s structure will adjust to ensure the device best suited to be the master becomes the master. *See id.* at 28 (citing Ex. 1008 ¶¶ 20, 21, 23, 24, 29; Ex. 1004 ¶ 213). Petitioner also asserts that Morris discloses a method of operating its ad-hoc communication system. *See id.* at 29–30 (citing Ex. 1008 ¶¶ 21, 28, 29; Ex. 1004 ¶¶ 216–217). Patent Owner does not dispute Petitioner’s contentions addressing the preamble of claim 6. *See* Prelim. Resp. 10–17.

Based on the entire trial record before us, we find that Morris teaches “[a] method of operating an ad-hoc radio communication system having a plurality of stations formed into at least one network,” as recited in the preamble of claim 6.

- b. Claim 6: determining a master/slave rank of each station in the network representative of the station's suitability for acting as master in the network using antenna performance characteristics of each station in view of the antenna's local environment*

Petitioner asserts that the combination of Morris, Sugaya, and Hulyalkar teach “determining a master/slave rank of each station in the network representative of the station’s suitability for acting as master in the network,” as recited in claim 6. *See* Pet. 32–41. Petitioner contends that Morris discloses that each wireless node or station includes an RF receiver disposed for communication with other nodes in the network. *See id.* at 32–33 (reproducing Ex. 1008, Fig. 2 with annotations; citing Ex. 1008 ¶ 26; Ex. 1004 ¶¶ 224–225). Petitioner asserts the RF transceiver in at least one station is coupled to an antenna. *See id.* at 33–34 (reproducing Ex. 1008, Fig. 2 with annotations; citing Ex. 1004 ¶ 226). Petitioner acknowledges that Morris does not use the term “antenna,” but asserts that Morris uses the industry standard symbol to depict an antenna in Fig. 2. *See id.* at 34 (citing Ex. 1004 ¶ 227); *see also id.* at 34–35 (reproducing Ex. 1001, Fig. 2; Ex. 1008, Fig. 2). According to Petitioner, one with ordinary skill in the art “would have understood *Morris* to disclose an antenna attached to an RF transceiver to aid in communication with other nodes in the network.” *Id.* at 35–36 (citing Ex. 1004 ¶ 227). Petitioner also asserts, “if there is a question whether Morris discloses an antenna, it would have been obvious to incorporate *Sugaya*’s antenna into *Morris*’s system.” *Id.* at 36 (citing Ex. 1004 ¶ 228); *see id.* at 32–37 (reproducing Ex. 1001, Fig. 2 with annotations; Ex. 1007, Fig. 3 with annotations; Ex. 1008, Fig. 2 with annotations; citing Ex. 1008 ¶¶ 20, 21, 23, 24, 26, 29; Ex. 1007, 4:22–27, 5:10–19; Ex. 1004 ¶¶ 224–232).

Petitioner further asserts that Morris discloses a first station that assesses its suitability to act as the master in a network by analyzing its operating mode and comparing it to the respective operating modes of other devices, where the operating modes reflect its mobility, power resources, and other parameters bearing upon a station's suitability to periodically transmit broadcast messages. *See* Pet. 38 (citing Ex. 1008 ¶¶ 21, 28, 29; Ex. 1004 ¶ 234). Petitioner contends that Morris discloses that the device with the operating mode deemed to be preferable becomes the master. *See id.* (citing Ex. 1008 ¶ 21). Petitioner acknowledges that the operating modes of Morris do not expressly identify antenna performance. *See id.* Petitioner contends that a skilled artisan would have understood Hulyalkar's teachings of assessing antenna performance to fit within Morris's category of other parameters bearing upon a station's suitability to transmit. *See id.* (citing Ex. 1004 ¶ 234).

According to Petitioner, "*Hulyalkar* discloses determining a rank representative of the station's suitability for acting as master in the network using performance characteristics of the antenna means in view of its local environment." Pet. 38 (citing Ex. 1004 ¶¶ 108–114, 235). Petitioner contends that Hulyalkar teaches an ad-hoc radio network of mobile terminals, one of which is designated the master or central controller, where each terminal has a MAC controller to assess signal quality. *See id.* at 38–39 (citing Ex. 1006, 3:17–4:16, 6:32–34, 7:11–25, 9:3–5, Fig. 1; Ex. 1004 ¶ 235). Petitioner argues that Hulyalkar further discloses that a quality of service (QoS) manager in the central controller compiles measured signal quality information that it and other stations created and analyzes the information to assess the central controller's rank and the rank

of the other stations based on antenna performance. *See id.* at 39 (citing Ex. 1006, 2:21–33, 5:3–19, 5:27–32, 7:7–25; Ex. 1004 ¶¶ 114, 236, 237). According to Petitioner, “[b]ecause *Hulyalkar*’s quality assessments are based on real-world, received signal measurements, they account for antenna performance characteristics in view of an antenna’s local environment.” *Id.* (citing Ex. 1006, 2:21–33, 5:3–19, 7:11–8:22, 8:32–9:11; Ex. 1004 ¶ 238). Petitioner contends that, as an example, if an antenna becomes shadowed by a user’s body so its received signal strength is diminished, these quality assessments would account for the environmental change and register a lower received signal strength. *Id.* at 39–40 (citing Ex. 1006, 2:21–33, 5:3–19, 7:11–8:22, 8:32–9:11; Ex. 1004 ¶ 236). Petitioner further asserts, “[b]ecause these ‘quality assessment[s]’ are compared to identify which station should be the master, they constitute ‘a rank representative of the station’s suitability for acting as master.’” *Id.* at 40 (citing Ex. 1006, 7:11–8:22, Fig. 5; Ex. 1004 ¶ 238) (second alteration in original).

Patent Owner contends that *Hulyalkar* does not teach “antenna performance characteristics” because *Hulyalkar* teaches assessing the quality of communication paths among stations in a wireless network. *See* PO Resp. 16 (citing Ex. 1006, code (57), 5:27–29, 7:2–10, Fig. 5); Sur-reply 5 (citing Ex. 1006, code (57), Fig. 5). Based on similar arguments to those addressing the claim construction of “antenna performance characteristics of each station in view of the antenna’s local environment,” (*compare* PO Resp. 16–17 *and* Sur-reply 4–6, *with* PO Resp. 12–14), Patent Owner asserts that “antenna performance characteristics,” is not met by the quality of communication paths between pairs of stations in a network. *See* PO Resp. 16; Sur-reply 5. In reference to *Hulyalkar*’s teachings of measuring the

signal to noise ratio (SNR) to measure the quality of communication paths between stations, Patent Owner contends that the strength, at one station in the network, of the desired signal from another station in the network, and the amount of noise in the signal detected by the receiving station, are based on many factors other than features of the antenna. *See* PO Resp. 16–17; Sur-reply 6. According to Patent Owner, “[b]ecause numerous factors affect the signal to noise ratio, a [person of ordinary skill in the art] would not consider a ranking based upon SNR to be a ranking based upon features of the antenna.” PO Resp. 17; *see* Sur-reply 6.

Petitioner responds that Patent Owner provides no evidence to support its contention regarding what a person of ordinary skill in the art would consider a ranking based upon features of the antenna. *See* Reply 14. Petitioner further contends that because Hulyalkar’s “quality assessments are based on real-world, received signal measurements, they assess ‘antenna performance characteristics’ even under [Patent Owner]’s proposed construction.” *Id.* at 15 (citing Pet. 38–40) (internal quotations omitted). Patent Owner disputes Petitioner’s response, arguing that it contradicts Patent Owner’s arguments regarding the proposed claim construction. *See* Sur-reply 4. According to Patent Owner, “[i]t is not sufficient to check for the strength of the received signal, [] rather features of the antenna in its local environment constitute its performance characteristics that must be used.” *Id.*

We do not agree with Patent Owner’s arguments, because, as explained above in Section II.B., we do not adopt Patent Owner’s proposed construction for “antenna performance characteristics of each station in view of the antenna’s local environment.” Moreover, Patent Owner’s arguments

that a person of ordinary skill in the art would not consider ranking based upon SNR to be a ranking based upon features of the antenna is mere attorney argument unsupported by evidence of record. Argument of counsel cannot take the place of objective evidence. *See Gemtron*, 572 F.3d at 1380.

Patent Owner further argues that Hulyalkar does not teach “antenna performance characteristics of each station in view of the antenna’s local environment,” because Hulyalkar teaches the quality assessment is performed by the receiving station based upon transmissions received from other stations. According to Patent Owner, “assessing only the paths at the receiving end does not provide information about the features of the antenna that affect its performance.” We do not agree with Patent Owner’s arguments, because, as explained above in Section II.B., the ’522 Patent claims, Specification, and prosecution history do not support Patent Owner’s proposed construction and related assertion that it excludes measurements at the receiving end of a path between two stations.

Based on the entire trial record before us, we find Hulyalkar teaches “using antenna performance characteristics of each station in view of the antenna’s local environment,” when given its ordinary and customary meaning which includes “measures of VSWR or other signal quality measures.” We also find that, based on the entire trial record before us, the combined teachings of Morris, Hulyalkar, and Sugaya teach “determining a master/slave rank of each station in the network representative of the station’s suitability for acting as master in the network using performance characteristics of the antenna means in view of its local environment,” as recited in claim 6.

Based on Petitioner's identified disclosures of Morris, Hulyalkar, and Sugaya, and supporting testimony (Ex. 1004), we are persuaded Petitioner sets forth sufficient articulated reasoning with rational underpinning to support the conclusion that it would have been obvious to a person of ordinary skill in the art to modify Morris's teachings of ranking of stations during its negotiation process (either alone or as modified to include Sugaya's antenna) to include ranking based on antenna performance characteristics, as taught by Hulyalkar, in order to enhance Morris's system functionality. *See* Pet. 37–38 (citing Ex. 1004 ¶¶ 233–241), 40–41 (citing Ex. 1004 ¶ 239); *KSR*, 550 U.S. at 418 (Fed. Cir. 2006). Petitioner asserts that it would have been obvious to one with ordinary skill in the art to consider the signal strength or antenna performance disclosed in Hulyalkar as relevant to determining a station's suitability to periodically transmit broadcast messages and relevant to the determination of the master as disclosed in Morris. *See* Pet. 40 (citing Ex. 1004 ¶ 239). Petitioner points out that Hulyalkar explains that selecting a master station based on communication quality or antenna strength is important to providing high-quality transmissions and optimizing network efficiency. *See id.* (citing Ex. 1006, 1:3–7, 2:11–17, 2:26–33, Abstract; Ex. 1004 ¶ 239). Petitioner asserts that one with ordinary skill in the art “would have reasonably expected implementing this metric in *Morris* to work without any dramatic alteration to station design.” *Id.* (citing Ex. 1004 ¶ 239); *see id.* at 40–41 (citing Ex. 1006, 3:17–31, 4:15–16, 6:32–7:6, 7:11–25, 9:3–5; Ex. 1008 ¶¶ 15, 26–28; Ex. 1004 ¶ 240).

Based on the entire trial record before us, we find that the combined teachings of Morris, Hulyalkar, and Sugaya render obvious “determining a

master/slave rank of each station in the network representative of the station's suitability for acting as master in the network using performance characteristics of the antenna means in view of its local environment," as recited in claim 6.

c. Claim 6: enabling a station with the highest rank to be master

Petitioner contends that Morris teaches "enabling a station with the highest rank to be master," as recited in claim 6, based on Morris's description of a negotiation process. *See* Pet. 41–42 (citing Ex. 1004 ¶¶ 242–245). Petitioner asserts that Morris's negotiation process includes a first station that determines its ability to be master relative to other stations, where each station is assigned an operating mode that reflects parameters bearing upon its suitability to periodically transmit. *See id.* (citing Ex. 1008 ¶¶ 21, 28, 29). Petitioner further contends that Morris discloses that during negotiation, the first station issues an advertisement message identifying its operating mode, and a second station receives the advertisement message and responds with an acknowledgement message identifying the second station's inherent capabilities or operating mode. *See id.* at 42 (citing Ex. 1008 ¶¶ 20, 21, 29; Ex. 1004 ¶ 243). Petitioner asserts that Morris teaches that a first station compares its operating mode to another station's operating mode, and, if it determines the other station has a better operating mode, and is better suited to be master, it sends a message that instructs the new master node to assume the role, and the other station will take over the role of master. *See id.* (citing Ex. 1008 ¶¶ 21, 29, 30; Ex. 1004 ¶ 244).

Based on the entire trial record before us, we find that Morris teaches "enabling a station with the highest rank to be master," as recited in claim 6.

d. Claim 7: determining the performance of the antenna means dynamically

Petitioner asserts that the combination of Morris, Hulyalkar, and Sugaya further teaches “determining the performance of the antenna means dynamically.” *See* Pet. 43–44. Petitioner acknowledges that Morris does not teach this limitation. *See id.* at 43. Petitioner asserts that Hulyalkar discloses this limitation based on quality assessments that take into account dynamic factors such as received signal strength that are provided to a centralized controller or master periodically or on demand. *See id.* at 43–44 (citing Ex. 1006, 2:26–33, 5:27–32, 7:11–25; Ex. 1004 ¶ 248). According to Petitioner, “[b]y measuring antenna signal strength . . . and by doing so repeatedly over time, under real-world environmental conditions, a skilled artisan would have understood *Hulyalkar* to disclose ‘determining the performance of the antenna means dynamically.’” *Id.* at 44 (citing Ex. 1004 ¶¶ 246–248). Patent Owner presents arguments addressing only the limitations of claim 6, which we do not agree with for the reasons discussed in the above preceding sections. *See* PO Resp. 10–17.

Based on the entire trial record before us, we find that the combined teachings of Morris, Hulyalkar, and Sugaya teaches “determining the performance of the antenna means dynamically,” as recited in claim 7. For the foregoing reasons, and after having analyzed the entirety of the record and assigning appropriate weight to the cited supporting evidence, we determine that Petitioner has established by a preponderance of the evidence that claim 7 is unpatentable under 35 U.S.C. § 103(a) over Morris, Hulyalkar, and Sugaya.

e. Claim 8: determining the rank of a station depending on its access to mains power

Petitioner asserts that the combination of Morris, Hulyalkar, and Sugaya further teaches “determining the rank of a station depending on its access to mains power.” *See* Pet. 44. Petitioner acknowledges that Morris and Hulyalkar do not teach this limitation. *See id.* Petitioner asserts that Sugaya teaches selecting a station with access to AC power as the master is better than selecting a station running on battery power because a battery may be depleted and the loss of a control station would disrupt the network. *See id.* (citing Ex. 1007, 12:7–39).

We are persuaded that Petitioner sets forth sufficient articulated reasoning with rational underpinning to support the conclusion that it would have been obvious to one of ordinary skill in the art to incorporate Sugaya’s teachings into Morris’s decision making scheme to enhance system functionality and optimize network structure by reducing the risk that the station may lose battery power and disrupt the network’s connections. *See* Pet. 44–45 (citing Ex. 1008 ¶¶ 21, 28, 29; Ex. 1004 ¶ 251), 46–47 (citing Ex. 1004 ¶¶ 249–255); *KSR*, 550 U.S. at 418. Petitioner contends that this modification would have been obvious because a person of ordinary skill in the art would have wanted to consider access to mains power as an additional parameter bearing upon a station’s suitability to be the master because Sugaya teaches that selecting a station with access to AC power as the master is better than selecting a station running on battery power because a battery may be depleted, causing the loss of a control station that would disrupt the network. *See id.* at 44–45 (citing Ex. 1008 ¶¶ 21, 28, 2; Ex. 1007, 12:7–39; Ex. 1004 ¶ 251). Petitioner asserts that one

with ordinary skill in the art “would have expected the stations in Morris to be able to rank successfully based on the ‘access to mains power’ without significantly altering station design.” *Id.* at 45 (citing Ex. 1004 ¶ 252); *see id.* at 45–46 (citing Ex. 1006, 6:26–27; Ex. 1007, 4:22–27, 5:13–19, 11:12–37; Ex. 1008 ¶¶ 26–28; Ex. 1014, 4:40–65, 12:62, 14:24, 16:23–34, Fig. 1; Ex. 1004 ¶¶ 101–107, 115–118, 252–255). Patent Owner presents arguments addressing only the limitations of claim 6, which we do not agree with for the reasons discussed in the above preceding sections. *See* PO Resp. 10–17.

Based on the entire trial record before us, we find that the combined teachings of Morris, Hulyalkar, and Sugaya renders obvious “determining the rank of a station depending on its access to mains power,” as recited in claim 8. For the foregoing reasons, and after having analyzed the entirety of the record and assigning appropriate weight to the cited supporting evidence, we determine that Petitioner has established by a preponderance of the evidence that claim 8 is unpatentable under 35 U.S.C. § 103(a) over Morris, Hulyalkar, and Sugaya.

III. PATENT OWNER’S ADDITIONAL ARGUMENT

Patent Owner argues that this *inter partes* review must be dismissed on the basis that administrative patent judges are unconstitutionally appointed principal officers. *See* PO Resp. 18–21. We do not reach Patent Owner’s constitutional argument because the Supreme Court resolved the issue in *U.S. v Arthrex*, 141 S. Ct. 1970 (June 21, 2021).

IV. CONCLUSION⁶

Petitioner has shown by a preponderance of the evidence that claims 7 and 8 are unpatentable.

V. ORDER

Accordingly, it is

ORDERED that the Petition as to claim 6 is *dismissed* as moot;

ORDERED that *inter partes* review as to claim 6 is *terminated*;

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 7 and 8 are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

In summary:

Claims	35 U.S.C. §	Reference(s) / Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
7, 8	103(a)	Morris, Hulyalkar, Sugaya	7, 8	
Overall Outcome			7, 8	

⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

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