Trials@uspto.gov
571-272-7822

Paper 26
Entered: October 3, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

CORRECT TRANSMISSION, LLC,
Patent Owner.

IPR2021-00682
Patent 7,283,465 B2

Before TERRENCE W. MCMILLIN, JOHN R. KENNY, and STEPHEN E. BELISLE, *Administrative Patent Judges*.

BELISLE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Juniper Networks, Inc. ("Petitioner") filed a Petition (Paper 1, "Pet.") requesting an *inter partes* review of claims 1–7, 9, 12–16, 27, and 28 ("Challenged Claims") of U.S. Patent No. 7,283,465 B2 (Ex. 1001, "the '465 patent"). Correct Transmission, LLC ("Patent Owner") filed a Preliminary Response to the Petition (Paper 6, "Prelim. Resp."; *see* Paper 4, 1). We instituted an *inter partes* review of claims 1–7, 9, 12–16, 27, and 28 of the '465 patent on all grounds of unpatentability alleged in the Petition. Paper 7 ("Institution Decision" or "Dec.").

After institution, Patent Owner filed a Response. Paper 12 ("PO Resp."). Petitioner filed a Reply. Paper 15 ("Pet. Reply"). Patent Owner filed a Sur-Reply. Paper 18 ("PO Sur-Reply"). We held a hearing on July 15, 2022, and a transcript of the hearing appears in the record. Paper 25 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. Under the applicable evidentiary standard, Petitioner has the burden to prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2022). "Preponderance of the evidence means the greater weight of evidence, evidence which is more convincing than the evidence which is offered in opposition to it." *United States v. C.H. Robinson Co.*, 760 F.3d 1376, 1383 (Fed. Cir. 2014) (internal quotations omitted). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons discussed below, and constrained by the record before us, we determine Petitioner has not established by a preponderance of the

evidence that any of claims 1–7, 9, 12–16, 27, and 28 of the '465 patent is unpatentable.

II. BACKGROUND

A. Related Proceedings

At the time of the Petition's filing, the parties indicated that the '465 patent was involved in two U.S. district court actions, namely, *Correct Transmission, LLC v. Juniper Networks, Inc.*, No. 6:20-cv-670 (W.D. Tex.) ("Juniper WDTX Case"); and *Correct Transmission, LLC v. Adtran, Inc.*, No. 6:20-cv-669 (W.D. Tex.) ("*Adtran*"). Pet. x; Paper 4, 1. In a subsequent updated mandatory notice, Patent Owner indicated that the Juniper WDTX Case was transferred to the Northern District of California as *Correct Transmission, LLC v. Juniper Networks, Inc.*, No. 3:21-cv-09284 (N.D. Cal.); and *Adtran* was transferred to the Northern District of Alabama as *Correct Transmission, LLC v. Adtran, Inc.*, No. 5:21-cv-00690 (N.D. Ala.). Paper 24, 1.

Patent Owner also indicated that the following matters may affect, or be affected by, a decision in this case: *Juniper Networks, Inc. v. Correct Transmission, LLC*, IPR2021-00469 (PTAB); *Juniper Networks, Inc. v. Correct Transmission, LLC*, IPR2021-00571 (PTAB); *Juniper Networks, Inc. v. Correct Transmission, LLC*, IPR2021-00814 (PTAB); and *Juniper Networks, Inc. v. Correct Transmission, LLC*, IPR2021-00984 (PTAB). Paper 4, 1; Paper 24, 1–2; *see* Pet. x (Petitioner indicating that it filed petitions for *inter partes* review of U.S. Patent No. 7,983,150 (IPR2021-00469) and U.S. Patent No. 7,127,523 (IPR2021-00571)).

B. The '465 Patent

The '465 patent is titled "Hierarchical Virtual Private LAN Service Protection Scheme," and issued October 16, 2007, from U.S. Patent Application No. 10/337,382, filed January 7, 2003. Ex. 1001, codes (10), (21), (22), (45), (54).

The '465 patent generally relates to "methods and systems for providing virtual private LAN services (VPLS)." Ex. 1001, 1:7–8. The '465 patent summarizes the invention as follows: "provide improved mechanisms for protection from failure in virtual private networks (VPNs), particularly Ethernet VPNs" by using a network comprising primary core nodes and standby core nodes having the same topology as a corresponding primary core node which it protects. *Id.* at 4:50–63.

> [I]f the primary core node fails, the remaining nodes in the network simply redirect all connections from the failed primary core node to the corresponding standby core node. Since the standby core node has the same topology as the failed primary core node, the remaining nodes in the network do not need to re-learn MAC [Media Access Control] table addresses, and are thus able to recover quickly from the failure. In addition, since there is no topology change, there is no need to clear the MAC tables, so that packet flooding is reduced significantly.

Id. at 4:64–5:6.

Figure 1 of the '465 patent is reproduced below.

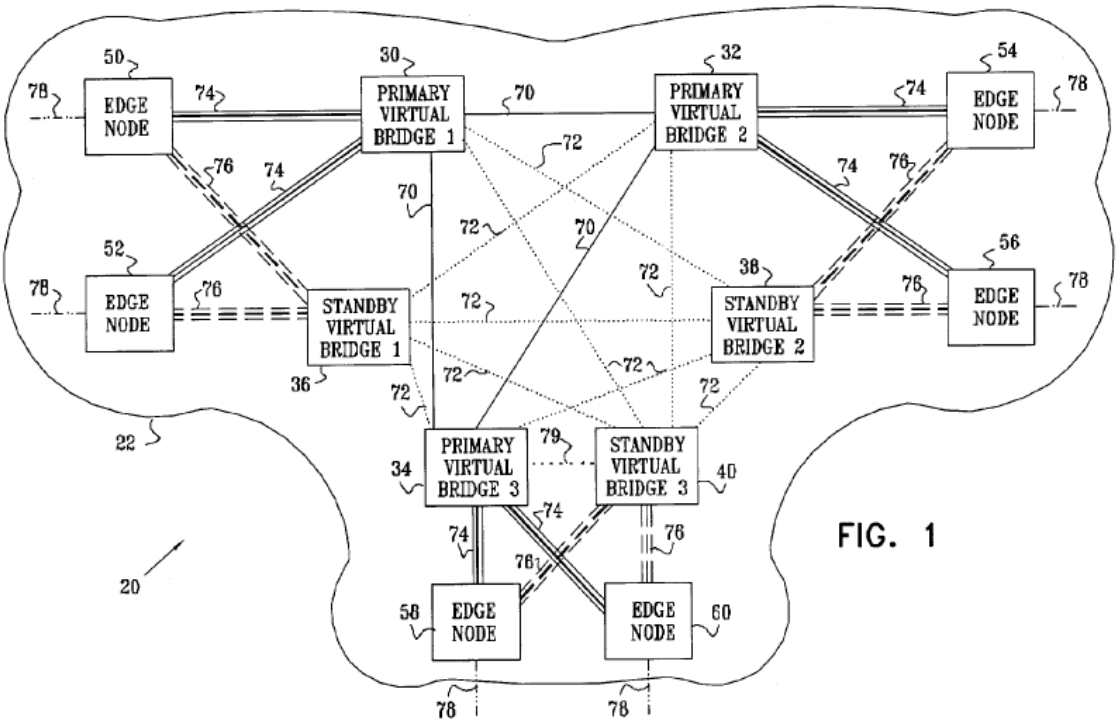

FIG. 1

Figure 1 is a block diagram that schematically illustrates a VPN with a protection scheme.

Ex. 1001, 7:16–17, Fig. 1. As shown in Figure 1 above, VPN 20 has a hierarchical VPLS topology, and implements a protection scheme built around a virtual private LAN service (VPLS), operating within network 22, typically an IP or Multiprotocol Label Switching (MPLS) network. *Id.* at 7:29–34. The VPLS is based on virtual bridges 30, 32, 34, 36, 38, and 40, or VPLS-capable provider edge PEs, which are connected by pseudo wires PWs 70, 72, 74 and 76 through network 22. *Id.* at 7:34–37.

"Three primary virtual bridges 30, 32 and 34, referred to as primary core nodes, are connected with each other in a full mesh with PW connections 70." Ex. 1001, 7:43–45. "Each of the primary core nodes 30, 32 and 34, is paired with a corresponding backup virtual bridge, referred to

as a standby core node, 36, 38 and 40, respectively." *Id.* at 7:48–51. "The standby core nodes are connected in the network by redundant backup connections 72," and "[e]ach standby core node has a topology identical to its corresponding primary core node." *Id.* at 7:51–54.

The '465 patent describes, "[i]f a primary core node fails, all connections 70, 74 and 72 to the failed primary core node are no longer used," and "[b]ackup connections 72 and 76 to the corresponding standby core node are used instead." Ex. 1001, 8:7–10. "For example, if primary core node 30 fails, edge nodes 50 and 52, which prior to the failure had been communicating through PW connections 74 with primary core node 30, begin instead to communicate with standby core node 36 through PW connections 76." *Id.* at 8:10–14. "The other core nodes (typically primary core nodes 32 and 34, but possibly standby core nodes 38 and 40 if there were other primary core node failures) begin to use backup PW connections 72 to communicate with standby core node 36." *Id.* at 8:14–18.

The '465 patent further describes that "[a] simple communications protocol for synchronizing MAC table databases between each pair of primary and standby core nodes can be invoked regularly to update the standby core node with the current MAC forwarding table stored in the corresponding primary core node." Ex. 1001, 8:63–67. "In this way, if a primary core node fails, the MAC table database of the corresponding standby core node is closely synchronized with the MAC table database of the failed node, and flooding caused by unknown MAC addresses is limited to the MAC addresses learned by the failed node since the last synchronization." *Id.* at 8:67–9:6.

C. Illustrative Claim

The '465 patent includes 30 claims, of which claims 1–7, 9, 12–16, 27, and 28 are challenged. Claims 1 and 16 are the challenged independent claims. Claim 1 is illustrative and reproduced below.

1. A data communication network, comprising:

a plurality of primary virtual bridges, interconnected by primary virtual connections so as to transmit and receive data packets over the network to and from edge devices connected thereto; and

a plurality of backup virtual bridges, each such backup virtual bridge being paired with a corresponding one of the primary virtual bridges and connected by secondary virtual connections to the other primary virtual bridges,

wherein the primary virtual connections define a respective primary topology image for each of the primary virtual bridges, and wherein each of the backup virtual bridges is connected to the other primary virtual bridges by secondary virtual connections that are identical to the primary virtual connections of the corresponding one of the primary virtual bridges, thus defining a respective secondary topology image that is identical to the respective primary topology image of the corresponding one of the primary virtual bridges, and

wherein each of the primary and backup virtual bridges is adapted to maintain a respective forwarding table, and to forward the data packets in accordance with entries in the respective forwarding table, and wherein each of the backup virtual bridges is adapted to periodically synchronize its forwarding table by copying contents of the forwarding table of the corresponding one of the primary virtual bridges with which it is paired,

whereby upon a failure of the corresponding one of the primary virtual bridges, each of the backup virtual bridge forwards and receives the data packets over the network via the secondary virtual connections, in accordance with the

> synchronized forwarding table, in place of the corresponding one of the primary virtual bridges.

Ex. 1001, 11:35–12:3.

D. Evidence of Record

Petitioner relies on the following patent evidence.

Name	Patent Document	Exhibit
Casey	7,269,132 B1	1005
Kuo	7,209,435 B1	1006
Balakrishnan	7,430,735 B1	1007

Pet. 2.

Petitioner also relies upon the Declaration of Yaling Yang, Ph.D. (Ex. 1003).

Patent Owner relies upon the Declaration of Robert Akl, D.Sc. (Ex. 2015).

E. Asserted Challenges to Patentability

We instituted *inter partes* review of claims 1–7, 9, 12–16, 27, and 28 of the '465 patent on the following grounds asserted by Petitioner. Dec. 2, 53; Pet. 2.

Claims Challenged	35 U.S.C. §	Reference(s)
1–7, 9, 12–16, 27, 28	103(a)[1]	Kuo, Balakrishnan
1–7, 9, 12–16, 27, 28	103(a)	Casey, Balakrishnan

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the '465 patent was filed before March 16, 2013, the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

III. ANALYSIS

A. Applicable Law

Petitioner challenges the patentability of claims 1–7, 9, 12–16, 27, and 28 of the '465 patent on the grounds that the claims would have been obvious under 35 U.S.C. § 103(a) in light of various references, namely, Kuo, Casey, and Balakrishnan. To prevail in its challenges to the patentability of the claims, Petitioner must establish unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). "In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review).

1. Obviousness – Generally

A claim is unpatentable under 35 U.S.C. § 103 if "the differences between the subject matter sought to be patented 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) when of record, objective evidence of obviousness or non-obviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Secondary considerations may include the following: "commercial success, long felt but unsolved needs, failure of others, etc."[2] *Id.* The totality of the evidence submitted may show that the challenged claims would not have been obvious to one of ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). When evaluating a combination of teachings, we must also "determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

The Supreme Court has made clear that we apply "an expansive and flexible approach" to the question of obviousness. *Id.* at 415. Whether a patent claiming a combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To reach this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed

[2] Patent Owner did not present any evidence or arguments directed to secondary considerations during this proceeding.

invention. *Id.* "To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

2. Reasonable Expectation of Success

"An obviousness determination requires finding that [an ordinarily skilled artisan] would have been motivated to combine or modify the teachings in the prior art and *would have had a reasonable expectation of success in doing so*." *Regents of Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018) (emphasis added); *see also OSI Pharms., LLC v. Apotex Inc.*, 939 F.3d 1375, 1382–85 (Fed. Cir. 2019); *Samsung Elecs. Co., Ltd. v. Elm 3DS Innovations, LLC*, 925 F.3d 1373, 1380–83 (Fed. Cir. 2019). "'[A] reasonable expectation of success, not absolute predictability' supports a conclusion of obviousness." *Yamanouchi Pharm. Co. v. Danbury Pharmacal, Inc.*, 231 F.3d 1339, 1343 (Fed. Cir. 2000); *see Intel Corp. v. Alacritech, Inc.*, 817 F. App'x 1014, 1016–17 (Fed. Cir. 2020). "The reasonable-expectation-of-success analysis must be tied to the scope of the claimed invention." *Teva Pharms. USA, Inc. v. Corcept Therapeutics, Inc.*, 18 F.4th 1377, 1381 (Fed. Cir. 2021). "Whether the prior art discloses a claim limitation, whether a skilled artisan would have been motivated to modify or combine teachings in the prior art, *and whether she would have had a reasonable expectation of success in doing so are questions of fact*." *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021) (emphasis added).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

B. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art, at the time of the earliest effective filing date of the '465 patent:

> would have had a bachelor's degree in electrical engineering, computer engineering, computer science, or a closely related field, and one to two years of experience in the design and development of network communication systems. Alternatively, [the skilled artisan] would have [had] a Master's degree or similar post-graduate work in electrical engineering, computer engineering, computer science, or a closely related field, and less years of design and development experience.

Pet. 7 (citing Ex. 1003 ¶¶ 64–68).

Patent Owner contends "the proposed level of ordinary skill does not affect the ultimate analysis" and "takes no position with respect to Petitioner's proposed level of skill." PO Resp. 15–16.

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). The level of ordinary skill in the art also is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Considering the subject matter of the '465 patent, the background technical field, the prior art, and Petitioner's unopposed proposed definition of the skilled artisan, (a) we apply the level of skill set forth above, which

also is consistent with the testimony of Dr. Yang (Ex. 1003 ¶¶ 64–68); and (b) we determine this would have provided a sufficient level of skill in light of the technology at issue in the '465 patent and prior art.

C. Claim Construction

Neither Petitioner nor Patent Owner proposes any claim terms for construction. Pet. 8 ("Juniper construes each of the '465 claim terms as having its ordinary and customer meaning."); PO Resp. 11 ("Patent Owner submits that no claim terms require construction beyond their plain and ordinary meaning."). We do not find that the express construction of any term is necessary for this decision. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy."); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an inter partes review).

D. Obviousness of Claims 1–7, 9, 12–16, 27, and 28 Over the Combination of Kuo and Balakrishnan

Petitioner contends claims 1–7, 9, 12–16, 27, and 28 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Kuo (Ex. 1006) and Balakrishnan (Ex. 1007). Pet. 49–78; Pet. Reply 1–5, 8–14, 18–29. Patent Owner opposes Petitioner's contentions. PO Resp. 41–63; PO Sur-Reply 1–5, 7–14, 16–24. For the reasons expressed below, and based on the complete record before us, we determine Petitioner has not proven that an ordinarily skilled artisan would have had a reasonable expectation of success in modifying Kuo to achieve the recited inventions of claims 1–7, 9, 12–16, 27, and 28. Thus, we determine that Petitioner has not

demonstrated by a preponderance of the evidence that claims 1–7, 9, 12–16, 27, and 28 would have been obvious over the combination of Kuo and Balakrishnan.[3] We turn first to an overview of Kuo and Balakrishnan.

1. Overview of Kuo (Ex. 1006)

Kuo relates to "providing network route redundancy through Layer 2 devices, such as a loop free Layer 2 network." Ex. 1006, code (57). Kuo discloses its Layer 2 network includes multiple "virtual switches" "configured to transition between master and backup modes to provide redundant support for the loop free Layer 2 network, the switches communicating their status through use of a plurality of redundancy control packets." *Id*. Kuo discloses that its master and backup virtual switches

[3] In the Petition, Petitioner identifies its two challenges to the patentability of the Challenged Claims as "Ground 1," based on obviousness over the "combination" of Casey and Balakrishnan, and "Ground 2," based on obviousness over the "combination" of Kuo and Balakrishnan. *See, e.g.*, Pet. i, 1, 2, 9 ("The combination of Casey and Balakrishnan renders obvious the challenged claims 1-7, 9, 12-16, and 27-28."), 49 ("The combination of Kuo and Balakrishnan renders obvious the challenged claims 1-7, 9, 12-16, and 27-28."). Yet in presenting its case for unpatentability of claim 1 over the "combination" of Kuo and Balakrishnan, for example, Petitioner contends that Kuo "alone" either "discloses" or "renders" "obvious" every limitation in claim 1, and adds "or in view of Balakrishnan" renders obvious certain of those limitations. Although not presented especially clearly, *see* 35 U.S.C. § 312(a)(3) (the petition must identify "*with particularity* . . . *the grounds* on which the challenge to each claim is based" (emphasis added)), we understand Petitioner's bases here to require modifying Kuo or Casey to achieve the recited inventions of claims 1–7, 9, 12–16, 27, and 28, and the requisite modification(s) and reason(s) to perform such modification(s) allegedly are provided by Balakrishnan (or by "what was generally known in the art" (*see, e.g.*, Pet. 64–65)). Our analysis herein regarding "reasonable expectation of success" applies equally to each variation of Petitioner's bases as presented in the Petition.

communicate their status within the network using a Virtual Switch Redundancy Protocol ("VSRP"). *Id.* at 5:27–32, 6:66–7:16, 9:31–60. Kuo's VSRP provides route redundancy to Layer 2 networks by virtual switches communicating with one another to elect a master at any given time and the remaining virtual switches being in backup mode. *Id.* Kuo's network includes a series of VSRP aware switches that are each connected to a master virtual switch and to a backup virtual switch, as shown in Figure 1, reproduced below.

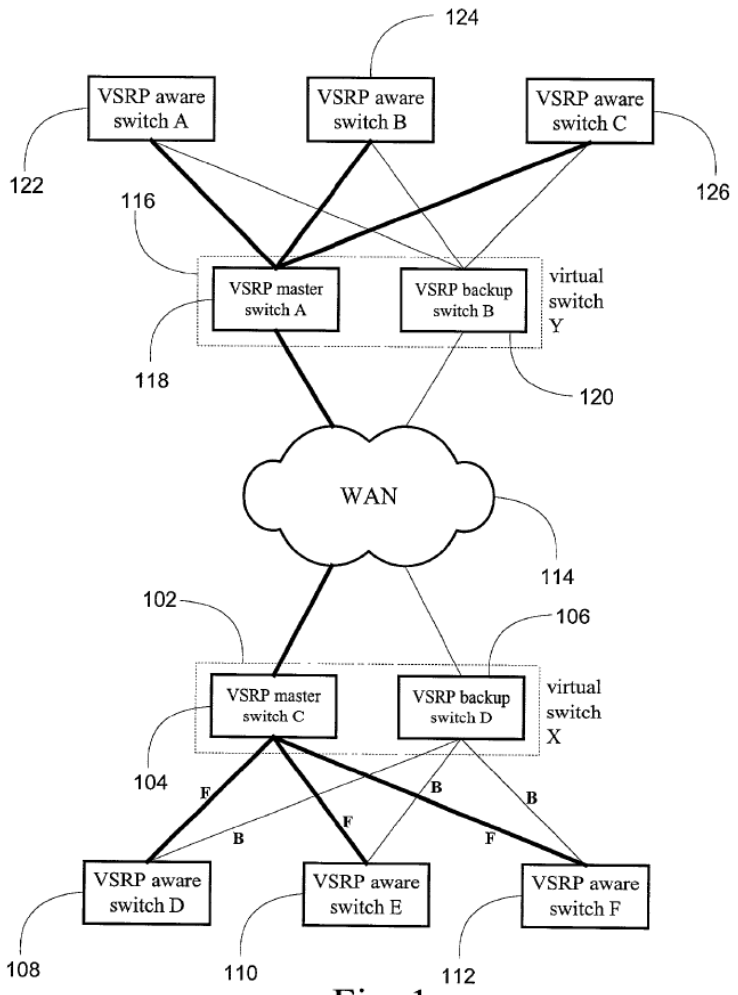

Fig. 1

Figure 1 is a block diagram depicting a configuration of VSRP and VSRP aware devices.

Ex. 1006, 4:25–27, Fig. 1.

In Figure 1 above, "[a] layer of devices 104, 106, 118, 120 reside between the VSRP aware devices performing L2 aggregation and switching 108, 110, 112, 122, 124, 126 and the network core 114." Ex. 1006, 5:53–55. Specifically, devices 122, 124, and 126 (VSRP aware switches A, B, and C respectively) connect to both device 118 (VSRP master switch A) and device 120 (VSRP master switch B) (collectively devices 118 and 120 are labeled as device 116, "virtual switch Y"). *Id.*, Fig. 1. Similarly, devices 108, 110, and 112 (VSRP aware switches D, E, and F respectively) connect to both device 102 (VSRP master switch C) and device 106 (VSRP master switch D) (collectively devices 104 and 106 are labeled as device 102, "virtual switch X"). *Id.* Additionally, the connection from devices 108, 110, and 112 to device 104 is labeled "F" and the connection from devices 108, 110, and 112 to device 106 is labeled "B." *Id.* Finally, each of devices 104, 106, 118, and 120 are connected to WAN 114. *Id.*; *see id.* at 5:23–6:11.

Kuo discloses that its network configuration provides failover protection by virtue of each VSRP aware switch being connected to the master and backup virtual switches that are in turn connected to a wide area network. Ex. 1006, 5:23–6:11.

Petitioner contends Kuo qualifies as prior art under 35 U.S.C. § 102(e) based on its filing date. Pet. 2. On this record, we have no evidence of an invention date other than the earliest possible effective filing date of the challenged claims. Thus, we determine that Kuo qualifies as prior art under 35 U.S.C. § 102(e) because Kuo's filing date of April 16, 2002, is before the

earliest possible effective filing date of the challenged claims, which is January 7, 2003. Ex. 1001, code (22); Ex. 1006, code (22).

We further discuss below the disclosure of Kuo in connection with the parties' arguments.

2. Overview of Balakrishnan (Ex. 1007)

Balakrishnan discloses:

> A software upgrade in a network node that includes primary and secondary control modules is provided by downloading a computer software upgrade onto the secondary control module, selecting the computer software upgrade to use on reboot of the secondary control module, rebooting the secondary control module using the computer software upgrade, and switching control of the network node from the primary control module to the secondary control module after the rebooting.

Ex. 1007, code (57). To ensure transitioning from the primary control module to the secondary control module avoids the loss of packets, Balakrishnan describes each primary and secondary control module includes a forwarding table for forwarding data packets:

> Forwarding traffic based on Layer 2 information involves comparing Layer 2 information in the traffic headers to forwarding information that is learned from previous traffic or established through user commands. In some high-speed network nodes, Layer 2 forwarding information (i.e., in the form of table entries) is accumulated centrally at the primary control module 106 in a software-based table and programmed into hardware-based tables for use in high-speed traffic forwarding.
>
> * * *
>
> FIG. 17 depicts . . . a process flow diagram of the above-described technique for synchronizing information that is stored in the software-based forwarding tables of the primary and secondary control modules.

Id. at 14:1–9, 16:35–38.

Balakrishnan generates/stores forwarding tables in primary and secondary control modules 1406, 1408 to provide redundancy if primary control module 1406 fails, as shown in Figure 14, reproduced below. Ex. 1007, 5:64–6:3, 11:14–17, 13:5–8, 13:48–61, 14:55–15:20.

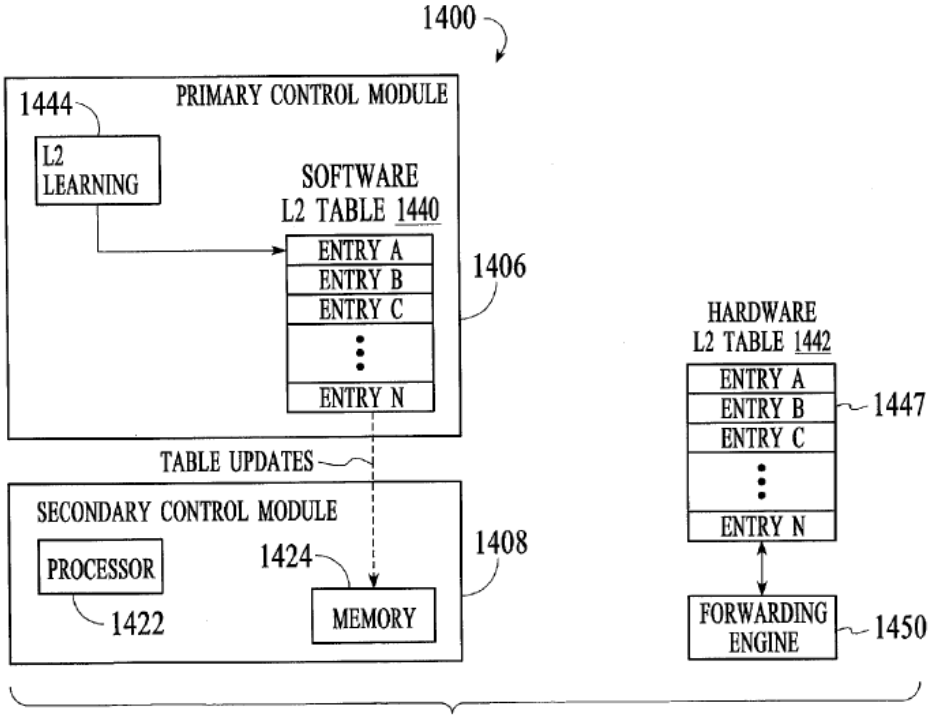

FIG. 14
(PRIOR ART)

Figure 14 depicts a network node in which periodic updates of the software-based Layer 2 table are provided directly to the secondary control module from the software-based Layer 2 table of the primary control module.

Id. at 3:55–59, Fig. 14.

As shown in Figure 14 above, Primary Control Module 1406, which contains Software L2 Table 1440, sends Table Updates to Memory 1424 in Secondary Control Module 1408. Ex. 1007, 14:65–15:20, Fig. 14.

To ensure the primary and secondary control modules have the most current

addresses for the connected network devices, Balakrishnan discloses periodically synchronizing the forwarding tables of the primary and secondary control modules:

> The copy of the software-based Layer 2 table is used by the secondary control module in the event of a switchover . . . [T]he software based Layer 2 tables of the primary and secondary control modules are synchronized by providing periodic updates of the Layer 2 table from the primary control module to the secondary control module.

Id. at 14:55–15:12.

Petitioner contends Balakrishnan qualifies as prior art under 35 U.S.C. § 102(e) based on its filing date. Pet. 2. On this record, we have no evidence of an invention date other than the earliest possible effective filing date of the challenged claims. Thus, we determine that Balakrishnan qualifies as prior art under 35 U.S.C. § 102(e) because Balakrishnan's filing date of May 7, 2002, is before the earliest possible effective filing date of the challenged claims, which is January 7, 2003. Ex. 1001, code (22); Ex. 1007, code (22).

We further discuss below the disclosure of Balakrishnan in connection with the parties' arguments.

3. Analysis

a) Independent Claim 1

Petitioner contends "Kuo teaches every element recited in [claim 1], but doesn't expressly disclose periodically synchronizing its forwarding tables." Pet. 51. Petitioner contends "such periodic synchronization would have been obvious to [the skilled artisan] in view of Balakrishnan's teachings" (Pet. 51) or "in conjunction with what was generally known in the art" (Pet. 64–65). The parties dispute, *inter alia*, whether Petitioner has

proven that the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables. PO Resp. 40–42, 60–62; Pet. Reply 8–11; PO Sur-Reply 7–12. Indeed, Patent Owner argues, "[w]ithout any evidence showing otherwise, the Board cannot simply assume that (1) Kuo can simply be reconfigured to periodically synchronize as required by the '465 Patent [or] (2) Balakrishnan's synchronization and Kuo's network would work together." PO Resp. 62. Patent Owner argues "Petitioner and its expert fail to put forward any evidence to demonstrate how this proposed reconfiguration or combination would work together." *Id.* (citing *Samsung Elecs. Co. v. Elm 3DS Innovations, LLC*, 925 F.3d 1373, 1380–81 (Fed. Cir. 2019) (upholding Board's determination of nonobviousness where Petitioner failed to sufficiently show reasonable expectation of success)); *see* PO Resp. 2 ("Petitioner almost completely ignores its requisite and separate burdens of establishing (1) motivation to combine and (2) reasonable expectation of success in the proposed combinations.").

In our Institution Decision, we preliminarily found "Petitioner has shown a reasonable likelihood of demonstrating a reasonable expectation of success of the proposed combination [of Kuo and Balakrishnan]." Dec. 24–25. However, on further review of the Petition and further consideration of the parties' briefing on this issue and the relevant case law, and based on the complete record before us, we now conclude otherwise. *See Fanduel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1340 (Fed. Cir. 2020) ("There is nothing inherently inconsistent about the Board instituting IPR on obviousness grounds and then ultimately finding that the petitioner did not provide preponderant evidence that the challenged claim

was obvious."); *In re Magnum Oil Tools*, 829 F.3d at 1376 ("[T]he decision to institute and the final written decision are 'two very different analyses,' and each applies a 'qualitatively different standard.'" (quoting *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016))).

In particular, we determine that Petitioner has not proven, by a preponderance of the evidence, that the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables. Neither the Petition nor the declaration from Dr. Yang that accompanied the Petition analyzed whether the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables. Pet. 49–68; Ex. 1003 ¶¶ 52–63, 186–229; *see generally* Pet. 1–84; Ex. 1003. Dr. Yang did not submit a second declaration in this proceeding. Pet. Reply (Exhibit List). Nevertheless, Petitioner argues that it proved the requisite reasonable expectation of success with the evidence that it cited in the Petition for other issues (e.g., motivation to combine) including Dr. Yang's declaration testimony on those issues, Dr. Yang's cross-examination testimony, Dr. Akl's cross-examination testimony, and additional evidence that Petitioner cited in its Reply. Pet. Reply 8–11. But the expert testimony and other evidence cited by Petitioner fail to prove, by a preponderance of the evidence, that the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables. We turn first to the Petition itself.

(1) The Petition and Reasonable Expectation of Success

We begin our analysis of whether Petitioner has evidenced sufficiently a reasonable expectation of success in modifying Kuo or combining Kuo and Balakrishnan to achieve the invention of claim 1 by emphasizing two guiding legal principles. First, *the Petition* must identify "with particularity … the evidence that supports the grounds for the challenge to each claim." 35 U.S.C. § 312(a)(3). As the Federal Circuit stresses:

> It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify with particularity the evidence that supports the grounds for the challenge to each claim. . . . [T]he expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute."

Wasica Finance GmbH v. Continental Automotive Systems, Inc., 853 F.3d 1272, 1286−87 (Fed. Cir. 2017) (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016), which quotes, in part, 35 U.S.C. § 312(a)(3)). Second, the burden of proving a reasonable expectation of success *is on Petitioner*. *Eli Lilly & Co. v. Teva Pharms. Int'l GmbH*, 8 F.4th 1331, 1348–49 (Fed. Cir. 2021) ("[I]t was, at all times, [petitioner's] burden to show that the claims would have been obvious, including that a skilled artisan would have had a reasonable expectation of success in achieving the claimed invention.").

Patent Owner argues, and we now agree, "Petitioner never mentioned any reasonable expectation of success" in the Petition.[4] PO Sur-Reply 8.

[4] Although not dispositive, it is at least noteworthy that the Petition does not use any of the terms "reasonable," "expectation," or "success" *at all* (except

Instead, as further discussed below, Petitioner in its Petition alleges reasons or motivations to modify Kuo or combine the teachings of Kuo and Balakrishnan (*see, e.g.*, Pet. 51, 67), and submits such reasons support its contention that claim 1 is obvious (*see* Pet. 49–68), but in doing so, Petitioner leaps silently over the requirement to evidence a reasonable expectation of success to establish obviousness. After Patent Owner highlighted this issue in the Petition (PO Resp. 60–62), Petitioner responded by characterizing its arguments and evidence, directed on their face to reasons or motivations to modify Kuo or combine the teachings of Kuo and Balakrishnan, as *also* being directed to reasonable expectation of success. Pet. Reply 8–11. Regardless, as discussed below, we find Petitioner's alleged evidence of the requisite reasonable expectation of success fails to meet its evidentiary burden.

For example, in its Petition, Petitioner contends "Kuo and Balakrishnan are in the same field of endeavor and contain overlapping disclosures with similar purposes," and that "[t]hese references illustrate it was well known and ubiquitous to periodically synchronize the forwarding tables of the primary and backup virtual bridges." Pet. 51. Petitioner contends "[m]odifying Kuo to periodically synchronize forwarding tables in view of Balakrishnan's teachings would have been *obvious* to [the skilled

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once in "*reasonable* likelihood the Challenged Claims are unpatentable" (Pet. 84 (emphasis added))), let alone in the context of analyzing and evidencing a "reasonable expectation of success" in provisioning Kuo to periodically synchronize forwarding tables. *See* Pet. 1–84. Similarly, it also is at least noteworthy that Dr. Yang's declaration does not use any of the terms "reasonable," "expectation," or "success" in the context of analyzing and evidencing a "reasonable expectation of success" in provisioning Kuo to periodically synchronize forwarding tables. *See* Ex. 1003.

artisan] because such periodic synchronization reduces the risk of potential data loss, especially during software upgrades to the primary and backup devices." Pet. 51 (emphasis added). Petitioner contends the skilled artisan "would have been *motivated* and found it *obvious to modify* Kuo's forwarding tables to implement Balakrishnan's teachings so as to periodically synchronize the forwarding tables." Pet. 51–52 (emphases added); *see* Pet. 67 (discussing "motivat[ion]" of "reduc[ing] the risk of potential data loss"). Although the foregoing contentions may address reasons or motivations to modify Kuo or combine the teachings of Kuo and Balakrishnan, Petitioner does not explain sufficiently *why* such contentions (and any underlying cited evidence), even if undisputed, show that the skilled artisan would have had a reasonable expectation of success in modifying *Kuo's particular network* to periodically synchronize forwarding tables given the particular design of Kuo's system, and given the complex nature of virtual private local area networking technology (and computer networking technology generally). *See* Ex. 2015 ¶ 99 ("[A]dding periodic synchronization into a system which does not embrace forwarding tables, but instead teaches a means for allowing redundancy packets to be flooded through a layer 2 network would not be a simple implementation, but instead require a complete redesign of the purpose of the Kuo system." (cited by PO Resp. 61)); *see also id.* ¶ 32 (discussing "complicate[d]" designs of networks with standard and backup protection connections); Ex. 1001, 4:29–33.

In its Reply, Petitioner stated, "[Patent Owner] doesn't address Petitioner's evidence on reasonable expectation of success," and "[s]imilarly, Dr. Akl doesn't address Petitioner's evidence on reasonable expectation of success." Pet. Reply 8. But notably, *in both instances*,

Petitioner does not cite to any such proffered "evidence." *Id.*; *see* PO Sur-Reply 8 ("In its Reply, Petitioner asserts that [Patent Owner] doesn't rebut Petitioner's evidence on reasonable expectation of success yet provides no citations to this actual 'evidence.' Petitioner then relies on 'predictable results' as apparent evidence of reasonable expectation of success.").

Petitioner in its Reply does *assert*, "Dr. Yang *analyzes how and why* modifying Kuo's network to periodically synchronize forwarding tables would have led to *predictable results*," and "[a]s Dr. Yang *explains*, because of Kuo's and Balakrishnan's similar failover and redundancy *goals* in multipoint connectivity networks, synchronizing Kuo's forwarding table periodically as taught by Balakrishnan would have been obvious to [the skilled artisan." Pet. Reply 8–9 (citing Ex. 1003 ¶¶ 54–57, 61–63, 225) (emphases added). But these assertions ring hollow upon review of the cited evidence: paragraphs 54–57 of Dr. Yang's declaration merely provide a brief overview of the Kuo patent by substantially quoting Kuo; paragraphs 61–63 of the declaration merely provide a brief overview of the Balakrishnan patent by substantially quoting Balakrishnan; and lone paragraph 225, which we further discuss below in Section III.D.3.a.2.a, merely concludes without analysis or explanation that "given that Kuo's network provides multipoint connectivity similar to Balakrishnan," "[m]odifying Kuo's network to periodically synchronize forwarding tables would have led to predictable results." Similarly, Petitioner in its Reply also *asserts*, "Dr. Yang provided *specific explanations* as to [the skilled artisan's] *expected results* for each combination—in her declaration and during cross-examination." Pet. Reply 10 (citing Ex. 1003 ¶ 108; Ex. 201[4], 19:19–22:1, 20:11–21:13) (emphases added). But here too this assertion rings hollow upon review of

the cited evidence: paragraph 108 of Dr. Yang's declaration merely mirrors paragraph 225, discussed above (and further below); and the cited cross-examination testimony, which we further discuss below in Section III.D.3.a.2.a, merely concludes without analysis or explanation that provisioning Kuo to periodically synchronize forwarding tables would have been easy. Contrary to its assertions, Petitioner does not direct us with particularity to (and we do not find) any such "specific explanations" of "expected results" of provisioning Kuo to periodically synchronize forwarding tables in the record before us. Importantly, the burden of proving a reasonable expectation of success *is on Petitioner* and never shifts to Patent Owner. *Dynamic Drinkware*, 800 F.3d at 1378; *Eli Lilly*, 8 F.4th at 1348–49.

Based on the complete record before us, in view of the two guiding legal principles discussed above, we determine that the Petition itself does not show, let alone with the particularity required by statute, a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables. *See* PO Resp. 60 ("Despite relying upon Balakrishnan for multiple limitations of the challenged claims, nowhere in the Petition is there a discussion or explanation as to why this purported combination would have been successful."). We also are unpersuaded by Petitioner's attempts to cure the Petition's deficiencies in its subsequent briefing to the Board, as discussed both above and below. *See Apple Inc. v. Andrea Elecs. Corp.*, 949 F.3d 697, 706–07 (Fed. Cir. 2020) ("[T]he petitioner in an inter partes review proceeding may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner.").

(2) The Parties' Expert Testimony Does Not Demonstrate a Reasonable Expectation of Success in Provisioning Kuo to Periodically Synchronize Forwarding Tables

Petitioner's declarant, Dr. Yang, and Patent Owner's declarant, Dr. Akl, each submitted one declaration in this proceeding. *See* Exs. 1003, 2015. Dr. Yang's declaration accompanied the Petition, and Dr. Akl's declaration accompanied the Patent Owner Response. Petitioner did not submit a responsive expert declaration from Dr. Yang with its Reply. *See* Pet. Reply (Exhibit List). We find that the declaration and cross-examination testimony provided by these experts does not demonstrate that the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables, as discussed below.

(a) Dr. Yang's Testimony

As noted above, in her declaration, Dr. Yang does not analyze whether the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables. *See generally* Ex. 1003. Nevertheless, Petitioner argues that testimony that Dr. Yang provided on other issues in her declaration (e.g., motivation to combine) demonstrates that the skilled artisan would have had the requisite expectation of success. Pet. Reply 8–11. In addition, Petitioner argues Dr. Yang's cross-examination testimony further demonstrates a reasonable expectation of success. *Id.* We disagree.

As Petitioner notes, Dr. Yang testified in her declaration that provisioning Kuo to periodically synchronize forwarding tables would have been an "obvious implementation" for the skilled artisan:

> Modifying Kuo's network to periodically synchronize forwarding tables would have led to predictable results given that Kuo's network provides multipoint connectivity similar to Balakrishnan. As such, synchronizing Kuo's forwarding table periodically is nothing more than an obvious implementation to [the skilled artisan] based on Balakrishnan's teachings.

Ex. 1003 ¶ 225 (cited by Pet. 65–67 n.191, which in turn is cited by Pet. Reply 8–10 n.28); *see* Ex. 1003 ¶¶ 217–224. To the extent that this testimony was intended to evidence a reasonable expectation of success, rather than a reason or motivation to modify Kuo (or combine Kuo and Balakrishnan) as expressly stated in the Petition, such testimony is conclusory.

Dr. Yang refers to "predictable results" in the abstract, without explaining what those "results" are, how they relate to the invention of claim 1, or how such "results" may evidence the ordinarily skilled artisan (not an expert) having a reasonable expectation that provisioning Kuo's disclosed system to periodically synchronize forwarding tables would be successful. Moreover, even if "Kuo's network provides multipoint connectivity *similar* to Balakrishnan" (Ex. 1003 ¶ 225 (emphasis added)), this is merely a high-level feature or goal of many such networks and does not itself show why the skilled artisan would have had a reasonable expectation of success in modifying *Kuo's particular network* to periodically synchronize forwarding tables given the particular design of Kuo's system, and given the complex nature of virtual private local area networking technology (and computer networking technology generally). Thus, we do not find this testimony persuasive. *See Skky, Inc. v. MindGeek, s.a.r.l.*, 859 F.3d 1014, 1022 (Fed. Cir. 2017) (the Board is "not required to credit [a party's] expert evidence simply because [the party] offered it"); *TQ Delta,*

LLC v. CISCO Sys., Inc., 942 F.3d 1352, 1359 (Fed. Cir. 2019) ("This court's opinions have repeatedly recognized that conclusory expert testimony is inadequate to support an obviousness determination on substantial evidence review."); *MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1172 (Fed. Cir. 2015).

As Petitioner notes, during cross-examination, Dr. Yang testified in the context of the Casey and Balakrishnan combination that the statements in her declaration that periodically synchronizing forwarding tables would have been an "obvious implementation" for the skilled artisan *also* evidence that the skilled artisan would have had a reasonable expectation of success in provisioning the subject prior art system to incorporate such periodic synchronization:

> Q. Okay. Can you, sitting here today, can you point me to what paragraph in your declaration where you account for reasonable expectation of success?
>
> A. Okay. You want -- I can find an example. [Turning to page 65, paragraph 108, of Dr. Yang's declaration (Ex. 1003).]
>
> * * *
>
> A. Right above Claim Element 1.7, yes, in the last sentence in Casey: As such, synchronizing Casey's forwarding table periodically is nothing more than obvious implementation to [the skilled artisan] based on Balakrishnan's teachings.
>
> So this is where I'm considering that [the skilled artisan] would find it -- it would be very simple for [the skilled artisan] to implement the system.
>
> Q. Okay. And in your opinion, is this -- like this conclusion about, it's easy for [the skilled artisan] to render it obvious the same as being or having a reasonable expectation of success?
>
> A. Given the knowledge of [the skilled artisan's] knowledge in the prior art, and yes, it means that he will have a reasonable

> expectation of success in implementing or -- in implementing a system that satisfy the claim, essentially synchronizing. In this particular sentence, synchronizing the forwarding table periodically.

Ex. 2014, 20:22–22:1 (cited by Pet. Reply 8–10 n.37).

This cross-examination testimony by Dr. Yang, however, also is conclusory and thus not persuasive. Indeed, the declaration testimony that provisioning Casey (or Kuo) to periodically synchronize forwarding tables is an "obvious implementation" is itself conclusory, as discussed above, let alone the post-declaration cross-examination testimony that those two words evidence the requisite reasonable expectation of success. Furthermore, even if periodically synchronizing forwarding tables, *in general*, were simple or easy for the skilled artisan to implement, this alone does not show that the skilled artisan would have had a reasonable expectation of success in modifying *Kuo's particular network* to periodically synchronize forwarding tables given the particular design of Kuo's system, and given the complex nature of virtual private local area networking technology (and computer networking technology generally). Dr. Yang does not explain why, given Kuo's particular network, it would have been simple or easy to modify that particular system to achieve the invention of claim 1—she merely concludes that doing so would be "simple." Ex. 2014, 20:22–22:1. Further, Dr. Yang has not identified the modifications that would be required to provision Kuo to periodically synchronize forwarding tables or why the skilled artisan would have found those modifications to be minor. *Id.*; *see* PO Sur-Reply 8 ("What the Petition and the supporting declaration fail to provide is the results of the combination or how Kuo's system functions with the modification.").

Admittedly, it can be difficult for an expert to support cross-examination testimony during cross-examination, but Petitioner had other means to support this testimony. Petitioner could have questioned Dr. Yang on redirect to support this testimony. Further, Petitioner could have submitted a reply declaration from Dr. Yang, particularly where Petitioner knew it would be relying on this cross-examination testimony in its Reply. Moreover, Dr. Yang could have analyzed the issue of reasonable expectation of success in her original declaration and provided this testimony and its support there. But Petitioner and Dr. Yang chose not to support the cited cross-examination testimony, and unsupported expert testimony is not persuasive.

In sum, we determine that Dr. Yang's declaration and cross-examination testimony does not support a finding of a reasonable expectation of success.

(b) Dr. Akl's Testimony

Both parties cite Dr. Akl's testimony to support their arguments regarding a reasonable expectation of success. PO Resp. 60–62 (citing Ex. 2015 ¶¶ 95–104); Pet. Reply 8–11 (citing Ex. 2015 ¶¶ 100–104; Ex. 1041); PO Sur-Reply 7–12 (citing Ex. 2015 ¶¶ 98–100). We determine that Dr. Akl's testimony *does not support* a finding that the skilled artisan would have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables.

As Patent Owner notes, Dr. Akl testified that the skilled artisan would not have had a reasonable expectation of success in provisioning Kuo to periodically synchronize forwarding tables:

> Replacing forwarding tables in a system designed for flooding through VSRP aware switches would not be successful. There would be no reason to have the tables, whereas in flooding, the packets are automatically routed to every node and flushed through the network. Further, adding periodic synchronization into a system which does not embrace forwarding tables, but instead teaches a means for allowing redundancy packets to be flooded through a layer 2 network would not be a simple implementation, but instead require a complete redesign of the purpose of the Kuo system. Further, [the skilled artisan] would not be successful in implementing Balakrishnan's software based periodic updates of Layer 2 tables into a system that seeks to flood Layer 2 redundancy packets.

Ex. 2015 ¶ 99 (cited by PO Resp. 61).

Further, Dr. Akl testified that "[t]o redesign this [Kuo] system with Balakrishnan's forwarding table synchronization method, it would require undue experimentation to create a working system" (Ex. 2015 ¶ 100), and that the skilled artisan "would not be motivated to alter Kuo and inject forwarding tables, which contradicts the purpose of the invention of Kuo" (*id.* at ¶ 101). *See* PO Resp. 61.

Petitioner, however, asserts that Dr. Akl's declaration testimony at paragraphs 100–104, including his testimony regarding "undue experimentation," provides merely "conclusory opinion." Pet. Reply 8 (citing Ex. 2015 ¶¶ 100–104). Petitioner also asserts, "Dr. Akl doesn't address Petitioner's evidence on reasonable expectation of success" (*id.*), but Petitioner does not address directly or respond to Dr. Akl's declaration testimony at paragraph 99, reproduced above, in which Dr. Akl disputes, *inter alia*, Dr. Yang's testimony that it would be "simple" to provision Kuo to periodically synchronize forwarding tables. *See* Ex. 2015 ¶ 99.

Petitioner also argues "Dr. Akl admitted it was known to utilize forwarding tables when 'looking at Layer-2' switches. And Dr. Akl concedes that his publications discuss the known benefits of periodically synchronizing in network components, e.g., sensor timers." Pet. Reply 10–11. But the issue before us is not whether Dr. Akl, an expert, knows of benefits of periodic synchronization in networking components, or whether some prior art systems use forwarding tables or periodic synchronization, as argued by Petitioner; rather, the issue before us is whether the ordinarily skilled artisan would have had a reasonable expectation of success in modifying *Kuo's particular network* to periodically synchronize forwarding tables given the particular design of Kuo's system, and given the complex nature of virtual private local area networking technology (and computer networking technology generally). Petitioner does not direct us to specific and persuasive evidence of the latter.

We agree with Patent Owner that the above testimony by Dr. Akl raises specific issues regarding provisioning Kuo to periodically synchronize forwarding tables. PO Resp. 61–62. Further, Dr. Akl's testimony regarding those issues seems plausible. To the extent that Dr. Akl's testimony regarding reasonable expectation of success is conclusory, it nevertheless highlights challenges to Petitioner's proof in this case, and Patent Owner does not have the burden to prove reasonable expectation of success by a preponderance of the evidence, Petitioner does. *Dynamic Drinkware*, 800 F.3d at 1378; *Eli Lilly*, 8 F.4th at 1348–49. Dr. Yang's failure to address the issues raised by the above testimony by Dr. Akl, when Petitioner had the opportunity to have her do so, further weighs in favor of a finding that Petitioner has not demonstrated a reasonable expectation of success.

In sum, we find that the portions of Patent Owner's expert's (Dr. Akl's) testimony relied upon by Petitioner do not support Petitioner's contention, and that the other portions cited by Patent Owner undermine Petitioner's contention, on reasonable expectation of success.

(c) Petitioner's Arguments Without Supporting Expert Testimony

Petitioner made a number of arguments (in its Reply) regarding a reasonable expectation of success that lack supporting expert testimony and thus, were not addressed in Section III.D.3.a.2 above. Pet. Reply 8–11. We address those arguments here, and as set forth below, we do not find these arguments persuasive.

Petitioner argues, under *In re Inland Steel*, factfinders may reasonably conclude that the strength of the correlation between references gives rise to a reasonable expectation of success from combining them. Pet. Reply 10 n.35 (citing *In re Inland Steel*, 265 F.3d 1354, 1364 (Fed. Cir. 2001). We determine this principle is not applicable here.

In *Inland Steel*, Inland argued that, when combining two particular prior art references, an ordinarily skilled artisan would not have reasonably expected that the combination would produce improved magnetic properties in electrical steel. *Id.* at 1362. In that case, "the prior art references identify a common problem (improving magnetic properties), and one of the references gives a specific example of a single critical parameter (the addition of antimony) and gives explicit guidance tying that parameter to the key parameter of another reference (steel prepared without hot-band annealing)." *Id.* at 1364. The Federal Circuit found: "The Board reasonably concluded that the strength of the correlation between the references gives

rise to a reasonable expectation of success from combining them." *Id.* In this proceeding, Petitioner has not shown sufficiently that Kuo (or Casey) and Balakrishnan have a similar correlation giving rise to a reasonable expectation of success in modifying Kuo (or Casey). Petitioner does not identify a common problem, a single critical parameter, or explicit guidance tying that parameter to the key parameter of the other reference that would lead to a reasonable expectation of success in provisioning Kuo (or Casey) to periodically synchronize forwarding tables. Pet. Reply 8–11. We also do not read *Inland Steel* as holding that the mere allegation of similarities in two references establishes a reasonable expectation of success in combining them.

Petitioner argues that modifying Kuo (or Casey) to provision Kuo (or Casey) to periodically synchronize forwarding tables "[does not] involve combinations where one must try numerous possible choices to arrive at a successful result." Pet. Reply 10. Petitioner, however, cites no expert testimony to support its assertion that the choices for provisioning the periodic synchronization of forwarding tables are so limited, nor does Petitioner explain even via attorney argument why the choices are purportedly so limited. *Id.* Further, Petitioner cites no authority that holds that the mere existence of a limited number of choices establishes a reasonable expectation of success.

In sum, we do not find the above arguments that Petitioner provided without supporting expert testimony to be persuasive.

(3) Conclusion

For the reasons expressed above, and based on (and constrained by) the complete record before us, we conclude that Petitioner has not

sufficiently evidenced a reasonable expectation of success in modifying Kuo to periodically synchronize forwarding tables and to achieve the recited invention of claim 1. Thus, we determine that Petitioner has not demonstrated by a preponderance of the evidence that independent claim 1 would have been obvious over the combination of Kuo and Balakrishnan.

b) Independent Claim 16 and Dependent Claims 2–7, 9, 12–15, 27, and 28

Petitioner argues independent claim 16 together with independent claim 1. *See* Pet. 49–68. Petitioner's evidentiary showing for independent claim 16, as well as for dependent claims 2–7, 9, 12–15, 27, and 28 (*see* Pet. 68–78), does not remedy the deficiencies in its evidentiary showing for independent claim 1. *See supra* Section III.D.3.a; *see also* Pet. 49–78; Pet. Reply 1–5, 8–14, 18–29. Thus, we determine that Petitioner has not demonstrated by a preponderance of the evidence that any of independent claim 16 and dependent claims 2–7, 9, 12–15, 27, and 28 would have been obvious over the combination of Kuo and Balakrishnan.

E. Obviousness of Claims 1–7, 9, 12–16, 27, and 28 Over the Combination of Casey and Balakrishnan

Petitioner contends claims 1–7, 9, 12–16, 27, and 28 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Casey (Ex. 1005) and Balakrishnan (Ex. 1007). Pet. 9–48; Pet. Reply 1–2, 5–11, 15–25, 29–32. Patent Owner opposes Petitioner's contentions. PO Resp. 16–40; PO Sur-Reply 1–2, 5–12, 14–19, 24. For the reasons expressed below, and based on the complete record before us, we determine Petitioner has not proven that an ordinarily skilled artisan would have had a reasonable expectation of success in modifying Casey to achieve the recited inventions of claims 1–7, 9, 12–16, 27, and 28. Thus, we determine that

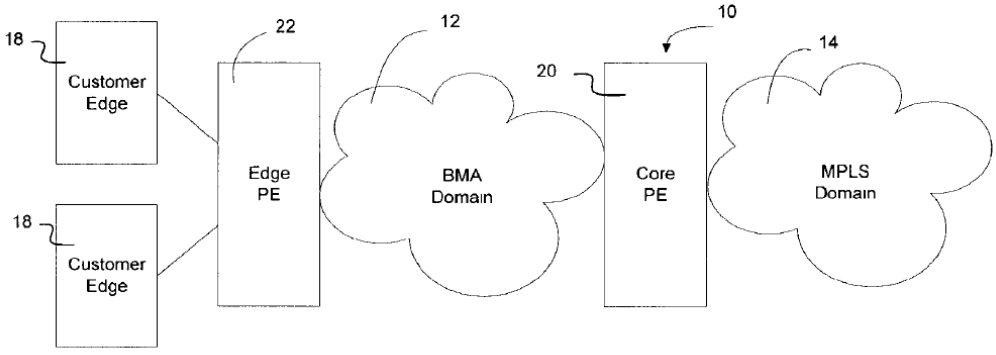
Petitioner has not demonstrated by a preponderance of evidence that claims 1–7, 9, 12–16, 27, and 28 would have been obvious over the combination of Casey and Balakrishnan.[5] We discuss Balakrishnan above in Section III.D.2. We turn to an overview of Casey.

1. Overview of Casey (Ex. 1005)

Casey relates to "achieving transparent redundancy at a hierarchical boundary in a communication network." Ex. 1005, 1:8–11. Casey provides redundancy at the boundary between an MPLS (Multi-Protocol Label Switching) domain and an Ethernet BMA ("Broadcast Multiple Access") domain by grouping boundary network devices into redundancy groups, in which "one is designated as master and the rest are designated as standbys." *Id.* at 4:29–38.

Casey's network includes customer edge network devices 18 and edge provider edge ("PE") network device 22 connected via BMA domain 12 to core PE network device 20 that connects to MPLS domain 14, as shown in Figure 2, reproduced below. Ex. 1005, 2:24–47, Fig. 2.

Figure 2



[5] *See supra* n.3.

Figure 2 depicts a functional block diagram of a network including a hierarchical boundary between a broadcast domain and an MPLS domain.

Id. at 4:59–61, Fig. 2.

Casey communicates data packets via "a simple load sharing organization of two platforms (A [42] & B [46]), each supporting two boundary network [] devices, the four boundary network devices being configured into two redundancy groups (Group 1 and Group 2)," as shown in Figure 5, reproduced below. Ex. 1005, 9:39–42.

Figure 5

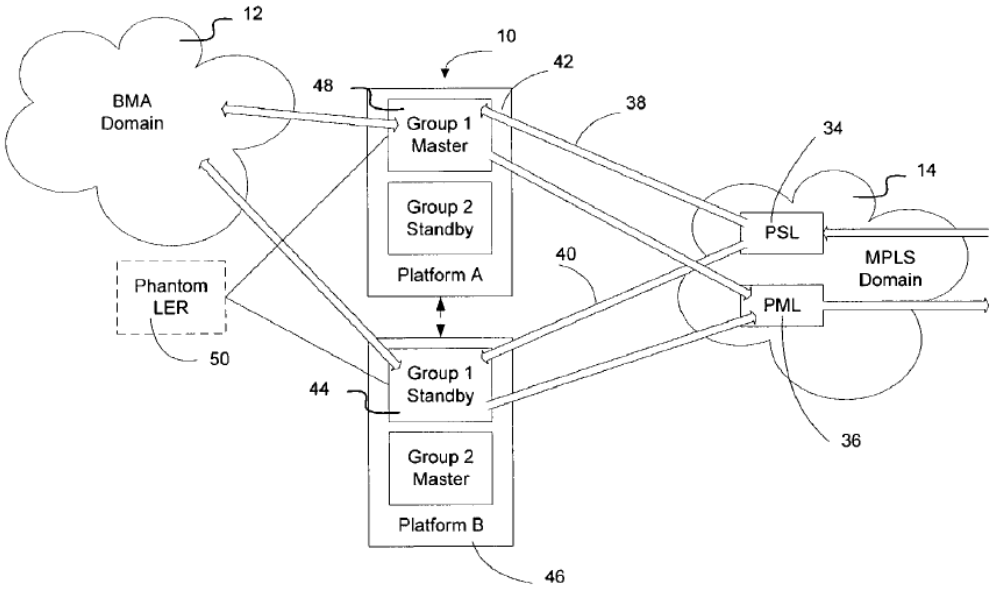


Figure 5 depicts a functional block diagram illustrating an example of redundant network devices at an BMA-MPLS hierarchical boundary.

Id. at 5:1–3, Fig. 5.

As shown in Figure 5 above, broadcast domain 10 includes primary boundary network device 48 (Group 1 Master) and Group 2 Standby, both on Platform A 42, and standby (backup) boundary network device 44 (Group 1 Standby) and Group 2 Master, both on Platform B 46. Ex. 1005,

9:14–54. The primary and backup boundary network devices connect to MPLS domain 14 through upstream PSL 34 (path switch LSR)) and PML 36 (path merge LSR) and connect to the BMA Domain and Phantom LER 50 (Label Edge Router). *Id.* at 1:16–23, 1:46–47, 5:33–59, 7:38–63. "[I]f there is a failure on platform A 42, the boundary network device (Group 1 standby 44) on platform B 46 will take over for the failed boundary network device (Group 1 master 48) on platform A." *Id.* at 9:46–50.

Petitioner contends Casey qualifies as prior art under 35 U.S.C. § 102(e) based on its filing date. Pet. 2. On this record, we have no evidence of an invention date other than the earliest possible effective filing date of the challenged claims. Thus, we determine that Casey qualifies as prior art under 35 U.S.C. § 102(e) because Casey's filing date of June 17, 2002, is before the earliest possible effective filing date of the challenged claims, which is January 7, 2003.[6] Ex. 1001, code (22); Ex. 1005, code (22).

We further discuss below the disclosure of Casey in connection with the parties' arguments.

2. Analysis

As with Kuo (*see supra*, Section III.D), Petitioner contends "Casey teaches every element recited in [claim 1], but doesn't expressly disclose periodically synchronizing its forwarding tables." Pet. 13. Petitioner again contends "such periodic synchronization was well within the ordinary skill

[6] In its briefing throughout this proceeding, Patent Owner argued (erroneously) that Casey does not qualify as prior art to the '465 patent. *See* Prelim. Resp. 28–32; PO Resp. 16–19; PO Sur-Reply 15–16. But during oral argument in this proceeding, Patent Owner withdrew this opposition. Tr. 40:25–41:5.

of [the skilled artisan] in view of Balakrishnan's teachings" (Pet. 13) or "in conjunction with what was generally known in the art" (Pet. 29). As with Kuo, the parties dispute, *inter alia*, whether Petitioner has proven that the skilled artisan would have had a reasonable expectation of success in provisioning Casey to periodically synchronize forwarding tables. PO Resp. 37–40; Pet. Reply 8–11; PO Sur-Reply 7–12. As with Kuo, Patent Owner argues, "[w]ithout any evidence showing otherwise, the Board cannot simply assume that (1) Casey can be reconfigured [to periodically synchronize as required by the '465 Patent] or (2) Balakrishnan's synchronization and Casey's network would work together." PO Resp. 38–39. Patent Owner argues "Petitioner and its expert fail to put forward any evidence to demonstrate how this proposed reconfiguration or combination would work together." *Id.* at 39 (citing *Samsung Elecs.*, 925 F.3d at 1380–81 (upholding Board's determination of nonobviousness where Petitioner failed to sufficiently show reasonable expectation of success)); *see* PO Resp. 2 ("Petitioner almost completely ignores its requisite and separate burdens of establishing (1) motivation to combine and (2) reasonable expectation of success in the proposed combinations.").

In our Institution Decision, as with Kuo, we preliminarily found "Petitioner has shown a reasonable likelihood of demonstrating a reasonable expectation of success of the proposed combination [of Casey and Balakrishnan]." Dec. 41–42. However, on further review of the Petition and further consideration of the parties' briefing on this issue and the relevant case law, and based on the complete record before us, we now conclude otherwise. *See Fanduel*, 966 F.3d at 1340; *In re Magnum Oil Tools*, 829 F.3d at 1376.

In particular, we determine that Petitioner has not proven, by a preponderance of the evidence, that the skilled artisan would have had a reasonable expectation of success in provisioning Casey to periodically synchronize forwarding tables. Neither the Petition nor the declaration from Dr. Yang that accompanied the Petition analyzed whether the skilled artisan would have had a reasonable expectation of success in provisioning Casey to periodically synchronize forwarding tables. Pet. 9–48; Ex. 1003 ¶¶ 45–51, 59–63, 71–185; *see generally* Pet. 1–84; Ex. 1003. Dr. Yang did not submit a second declaration in this proceeding. Pet. Reply (Exhibit List). Nevertheless, Petitioner again argues that it proved the requisite reasonable expectation of success with the evidence that it cited in the Petition for other issues (e.g., motivation to combine) including Dr. Yang's declaration testimony on those issues, Dr. Yang's cross-examination testimony, Dr. Akl's cross-examination testimony, and additional evidence that Petitioner cited in its Reply. Pet. Reply 8–11. But the expert testimony and other evidence cited by Petitioner fail to prove, by a preponderance of the evidence, that the skilled artisan would have had a reasonable expectation of success in provisioning Casey to periodically synchronize forwarding tables.

a) The Parties Rely on the Same or Substantially the Same Evidence and Arguments Concerning "Reasonable Expectation of Success" for Modifying Casey as for Modifying Kuo

The parties rely on the same or substantially the same evidence and arguments (or lack thereof) concerning "reasonable expectation of success" for provisioning Casey to periodically synchronize forwarding tables as for Kuo. *Compare* Pet. 9–48 (Casey), *with* Pet. 49–78 (Kuo); *compare* PO

Resp. 37–40 (Casey), *with* PO Resp. 40–42, 60–62 (Kuo); *see* Pet. Reply 8–11; PO Sur-Reply 7–12.

For example, Petitioner alleges evidence of such a reasonable expectation of success for modifying Casey based on the same testimony of Dr. Yang as used against Kuo, as illustrated below.

Casey	Kuo
Modifying Casey's network to periodically synchronize forwarding tables would have led to predictable results given that Casey's network provides multipoint connectivity similar to Balakrishnan. As such, synchronizing Casey's forwarding table periodically is nothing more than an obvious implementation to a POSITA based on Balakrishnan's teachings. Ex. 1003 ¶ 108.	Modifying Kuo's network to periodically synchronize forwarding tables would have led to predictable results given that Kuo's network provides multipoint connectivity similar to Balakrishnan. As such, synchronizing Kuo's forwarding table periodically is nothing more than an obvious implementation to a POSITA based on Balakrishnan's teachings. Ex. 1003 ¶ 225.

Compare Ex. 1003 ¶¶ 107–108, *and* Pet. 27–33, *with* Ex. 1003 ¶¶ 224–225, *and* Pet. 64–67; *see* Pet. Reply 8–11 (citing, *inter alia*, Ex. 1003 ¶¶ 108, 225).

Both Petitioner's Reply to Patent Owner's Response to the Petition and Patent Owner's subsequent Sur-Reply address "reasonable expectation of success" concerning Casey and Kuo together, and direct the same or substantially the same evidence and arguments against both Casey and Kuo. *See* Pet. Reply 8–11; PO Sur-Reply 7–12.

In view of the foregoing, we determine that our findings and conclusions concerning "reasonable expectation of success" for provisioning Kuo to periodically synchronize forwarding tables, as set forth above in Section III.D.3, apply equally to Casey. Thus, we do not repeat here the

same analysis of the parties' evidence and arguments already provided above in Sections III.D.3.a and III.D.3.b.

b) Conclusion

For the same reasons provided above in Section III.D.3, as well as the foregoing reasons, and based on (and constrained by) the complete record before us, we conclude that Petitioner has not sufficiently evidenced a reasonable expectation of success in modifying Casey to periodically synchronize forwarding tables and to achieve the recited invention of any of claims 1–7, 9, 12–16, 27, and 28. Thus, we determine that Petitioner has not demonstrated by a preponderance of the evidence that any of claims 1–7, 9, 12–16, 27, and 28 would have been obvious over the combination of Casey and Balakrishnan.

IV. CONCLUSION

As set forth in the following table, Petitioner has not proven, by a preponderance of the evidence, that any of the Challenged Claims are unpatentable:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–7, 9, 12–16, 27, 28	103(a)	Kuo, Balakrishnan		1–7, 9, 12–16, 27, 28
1–7, 9, 12–16, 27, 28	103(a)	Casey, Balakrishnan		1–7, 9, 12–16, 27, 28
Overall Outcome				1–7, 9, 12–16, 27, 28

V. ORDER

Upon consideration of the record, it is:

ORDERED that claims 1–7, 9, 12–16, 27, and 28 of U.S. Patent No. 7,283,465 B2 have not been shown, by a preponderance of the evidence, to be unpatentable; and

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

For PETITIONER:

Joseph Edell
Kyle Tsui
FISCH SIGLER LLP
joe.edell.IPR@fischllp.com
kyle.tsui@fischllp.com

For PATENT OWNER:

Bradley Liddle
Seth Lindner
CARTER ARNETT PLLC
bliddle@carterarnett.com
slindner@carterarnett.com