

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMCAST CABLE COMMUNICATIONS, LLC,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

Case IPR2024-00446
Patent 8,223,775

PATENT OWNER RESPONSE

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I. INTRODUCTION

Petitioner fails to prove that any of the challenged claims are invalid. The '775 patent is directed to a gateway cable modem with a specific architecture with structural and functional requirements expressly recited in the claims.

Specifically, the '775 patent seeks to integrate a variety of new services with the traditional cable modem service in an efficient and cost-effective manner. This is achieved with the partitioned architecture recited in the claims. By contrast, Petitioner's primary reference in each of its grounds, Rabenko, is directed toward the entirely different purpose of delivering a variety of signals entering a premises over a single wire to multiple terminals. Rabenko is simply not concerned with efficient and cost-effective partitioning of a cable modem. *See* Section II.

As a result, Petitioner fails to show that its grounds disclose or render obvious the required architecture, including a "DOCSIS controller," a data networking engine ("DNE") and cable modem engine ("CME") implemented in a "first circuit" and "second circuit" respectively, a CME "configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the" DNE, and other missing elements. *See* Section III.

II. THE '775 PATENT AND RABENKO HAVE DIFFERENT ARCHITECTURES DIRECTED TOWARDS DIFFERENT PURPOSES.

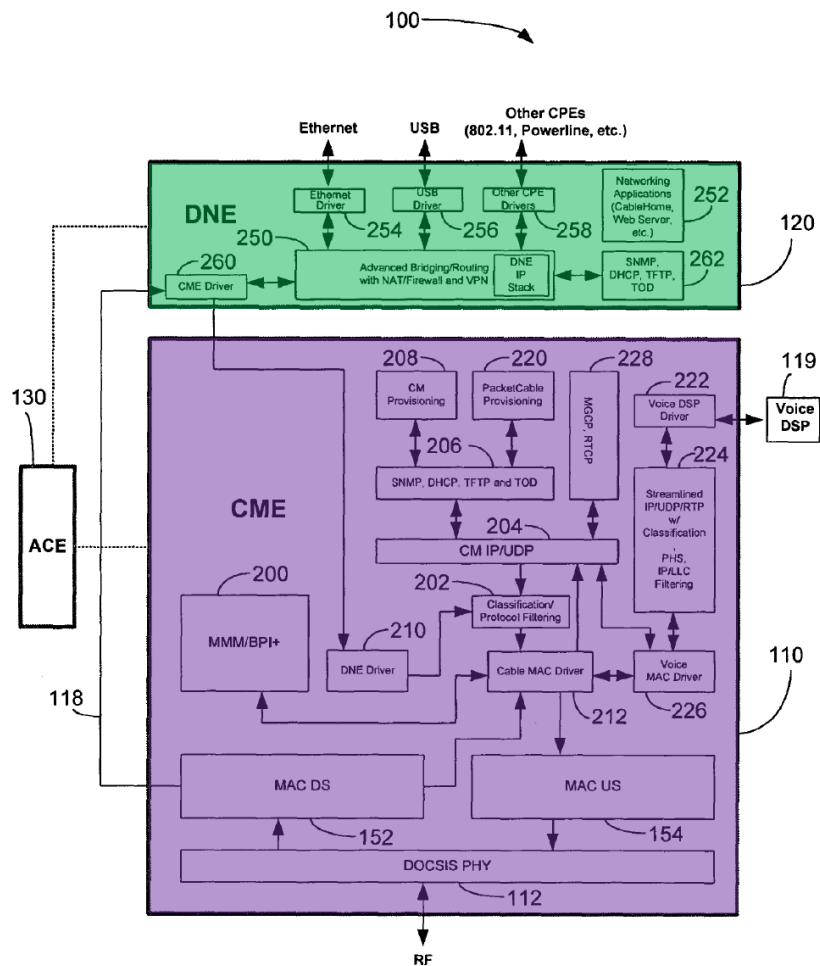
The '775 patent discloses a “future gateway cable modem (CM)” that “incorporate[s] a variety of functions beyond the traditional cable modem” such as “a wide range of data networking and VoIP services.” Ex. 1001 ['775] 1:13-15, 1:20-22. As the '775 patent teaches, a “major challenge in designing” the future gateway cable modem is “integrat[ing]” the data networking and VoIP services with “basic cable modem functionality in an efficient and cost-effective [manner].” *Id.*, 1:16-18. To address this challenge, the '775 patent identifies certain “objectives” that must be met by the inventive architecture, including “Functional Partitioning,” “Performance,” “Cost,” and “Software Re-Use.” *Id.*, 1:20-57. The '775 further makes clear that its novel “gateway cable modem architecture...meets all of these objectives.” *Id.*

To meet these objectives, the '775 patent's inventive gateway modem architecture is centrally based on separate “engines” that are functionally partitioned from one another and in separate circuits. See Ex. 1001 ['775] Fig. 2, 1:66-2:4. The first engine is a data networking engine (“DNE”) implemented in a “first circuit.” The DNE is responsible for home networking functions and interfaces into networks on-premises. *Id.* The second engine is a cable modem engine (“CME”) implemented in a “second circuit.” The CME is responsible for

cable modem functions and interfaces outside the premises to the cable operator and on to the internet. *Id.* This CME implements DOCSIS and includes both a DOCSIS MAC processor and a DOCSIS controller which perform distinct and specialized cable modem functions. *Id.*, 2:55-58; Ex. 2008 [Russ-2nd-Decl.] ¶ 33.

In accord, the claims require a DNE implemented in a “first circuit,” a CME implemented in a “second circuit” “separate” from the first, with “the cable modem functions performed by the cable modem engine [CME] ... completely partitioned from the home networking functions performed by the data networking engine [DNE].”¹ Ex. 1001 [’775] cl. 18, 8:24-27. This structure is, *e.g.*, reflected in Figure 2 which depicts a DNE and CME implemented in separate circuits and “completely partitioned” from one another:

¹ In another case involving the ’775 patent, the district court construed “wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine” to mean “wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are performed only by the data networking engine.” Ex. 1011 [Charter-Claim-Construction] 17.



Id., Fig. 2; Ex. 2008 [Russ-2nd-Decl.] ¶ 34.

The '775 patent's CME further includes several components, including a "DOCSIS MAC processor" which "implements real-time critical MAC functions" and a "DOCSIS controller" for controlling/implementing certain DOCSIS functions. Ex. 1001 ['775] 3:1-3, 3:26-35. This partitioned system results in "enhanc[ed]" "performance" (*id.*, 4:43-55), independent software development and upgrades (*id.*, 4:25-40), better partitioning of specific complex functions (*id.*, 4:13-24), and less delay and jitter (*id.*), among other benefits.

Petitioner's grounds are each centered upon Rabenko. Rabenko, however, discloses a materially different architecture. In contrast with the '775 patent, Rabenko does not disclose a DNE or a CME, much less ones implemented in "separate" circuits, with the cable networking functions of the CME "completely partitioned" from the data networking functions of the DNE.

Rabenko is, also, directed towards an entirely different issue. Whereas the '775 patent's architecture is directed towards an "efficient and cost-effective" cable modem architecture that partitions the functions of the CME and DNE, Rabenko is concerned with routing the various communications entering via a single wire to one of multiple terminal destinations. Ex. 2008 [Russ-2nd-Decl.] ¶¶ 55, 84. Specifically, per Rabenko, when "existing in home wiring is limited in many cases to a single wire pair," and it is "both expensive" and "disruptive" to install additional wires. Ex. 1005 [Rabenko] [0003]. As a solution, Rabenko teaches a "telecommunications system" "to support telephony and other services in the home using existing wire pairs already installed in the home." *Id.*, [0031].

In view of their significant differences, it is not surprising that Petitioner fails to prove that multiple limitations are met. The claims require a "DOCSIS controller," but Rabenko mentions no such thing. Petitioner attempts to overcome this shortfall by asserting that Rabenko's voice and data processor is a "DOCSIS controller." Petitioner, however, fails to show that this voice and data processor

controls or even has anything to do with any DOCSIS functions. *See* Section III.A. Nor does Rabenko disclose a DNE and a CME in separate circuits that are “completely partitioned” from one another. *See also* Section III.B. Additionally, Petitioner fails to demonstrate that Rabenko’s alleged CME is “configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the” DNE. *See* Section III.C. Petitioner also fails to demonstrate that multiple dependent claims are taught, including that all DOCSIS functions are localized in the CME (cls. 2 and 19) and that the DOCSIS processor is an ARM9TDMI-based RISC processor and the DOCSIS controller is an ARM940-based RISC processor (cl. 12). *See* Sections III.D-E.

III. PETITIONER’S GROUNDS FAIL TO SHOW A REASONABLE LIKELIHOOD OF OBVIOUSNESS (ALL CLAIMS AND GROUNDS).

A. Petitioner Fails To Demonstrate That Rabenko’s Voice And Data Processor Is A “DOCSIS Controller” (1[c]/14[c]/18[e], All Claims, All Grounds).

Each of the claims require a “cable modem engine including a DOCSIS controller.” Ex. 1001 [’775] cls. 18, 1 (similar), 14 (similar). Petitioner argues that Rabenko “discloses” a “DOCSIS controller” and does not argue that a DOCSIS controller would be obvious. Pet., 21. Petitioner, however, wholly fails to prove that Rabenko discloses a “DOCSIS controller.” *See* Section III.A.1.

While the Board found that Petitioner had a reasonable likelihood of prevailing as

to this limitation, that finding appears to have been based on the misapprehension that Patent Owner's understanding of a "DOCSIS controller" is that it must carry out the specific functions identified in the specification. ID, 34-35. That is not and has never been Patent Owner's position. Rather, a "**DOCSIS controller**," in view of the plain meaning and the intrinsic and extrinsic record, must "control" some "DOCSIS" functions and the specific DOCSIS functions identified in the specification are merely exemplary. See Section III.A.2. Petitioner's argument additionally fails because it fails to prove that Rabenko's voice and data processor controls **any** DOCSIS functions. See Section III.A.3.

1. Petitioner Fails To Prove That Rabenko's Voice And Data Processor Is A "DOCSIS Controller."

Rabenko does not mention a "DOCSIS controller." Petitioner contends, but fails to prove, that Rabenko's "voice and data processor 136/213" is a DOCSIS controller. *Id.* Rabenko's voice and data processor processes signals to and from a conventional telephone. Petitioner fails to provide any colorable explanation as to why a POSITA would consider Rabenko's voice and data processor to be a "DOCSIS controller." Indeed, Petitioner fails to even prove that Rabenko's voice and data processor has anything to do with DOCSIS.

As an initial matter, Petitioner's contention that Rabenko's voice and data processor is a "DOCSIS controller" is conclusory and unsubstantiated. Petitioner states that:

Rabenko's cable modem engine includes voice and data processor 136/213 ("DOCSIS controller") and DOCSIS MAC 134/212 ("DOCSIS MAC processor"). Ex. 1002, ¶¶134-139. Like the "DOCSIS controller" of the '775 Patent, Rabenko's voice and data processor 136/213 is used for processing and transporting voice over packet based networks. Ex. 1005, [0074], [0085], [0087]. Rabenko discloses limitation [18E].

Pet., 31. Petitioner's expert repeats the same conclusory statement. *See* Ex. 1002 [Kiaei-Decl.] ¶ 135.

Petitioner, thus, asserts that Rabenko's "voice and data processor" is a "DOCSIS controller," with its apparent rationale being that "like the '775's "DOCSIS controller," "Rabenko's voice and data processor ... is used for processing and transporting voice over packet based networks." *Id.* Critically, however, Petitioner does not tell us how a voice and data processor qualifies as a "DOCSIS controller." At best, Petitioner implicitly seems to suggest that a "DOCSIS controller" is something "used for processing and transporting voice over packet based networks." Petitioner, however, wholly fails to explain why a POSITA would have this understanding. *See* Ex. 2008 [Russ-2nd-Decl.] ¶¶ 40-42.

Moreover, while Petitioner does provide citations to Rabenko that allegedly demonstrate that the voice and data processor 136/213 “is used for processing and transporting voice over packet based networks,” Petitioner fails to provide any corresponding citations for the ’775 patent. *See* Pet., 31 (citing only Ex. 1005 [Rabenko] [0074], [0085], [0087]).

Petitioner thus merely identifies one alleged aspect of the DOCSIS controller without explaining what a DOCSIS controller is or why Rabenko’s voice and data processor is one. This is insufficient to meet its burden. *E.g.*, *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”); *In re Magnum Oil Tools*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements.”).

Petitioner also provides an unexplained citation to six paragraphs in Dr. Kiaei’s declaration. *See* Pet., 31 (citing Ex. 1002, ¶¶134-139). As an initial matter, the Board should disregard this improperly incorporated testimony. *See* 37 C.F.R. § 42.6(a)(3); *3M Co. v. Evergreen Adhesives, Inc.*, 860 Fed. App’x. 724, 725-728 (Fed. Cir. 2021) (Board properly declined to consider improperly

incorporated testimony); *Cisco Sys., Inc. v. C-Cation Techs, LLC*, IPR2014-00454, Paper 12, 7-13 (Aug. 29, 2014) (informative).

But even if these paragraphs were to be considered, they suffer from the same fundamental flaws as the Petition and similarly fail to demonstrate that Rabenko's voice and data processor is a "DOCSIS controller." Like Petitioner, Dr. Kiaei does not explain what a "DOCSIS controller" is or why Rabenko's "voice and data processor" is a DOCSIS controller. *See* Ex. 1002 [Kiaei-Decl.] ¶¶ 134-139; Ex. 2008 [Russ-2nd-Decl.] ¶¶ 41-42. Instead, Dr. Kiaei asserts that "the '775 Patent describes a function of the DOCSIS controller—'a DOCSIS controller implementing VoIP [(Voice over IP)] functionality.'" Ex. 1002 [Kiaei-Decl.] ¶ 137 (citing Ex. 1001 ['775] 2:10-11).

At best, Petitioner and Dr. Kiaei observe that the DOCSIS controller in the '775 patent can implement one function potentially in common with Rabenko's voice and data processor. But one potential area of overlap does not suggest that two things are the same. A car and an airplane both transport passengers, but a car is not an airplane. Moreover, if, *arguendo*, a "DOCSIS controller" includes a processor that is merely a voice and data processor as Petitioner contends, a VoIP system such as a wired ethernet or cellular system could have a "DOCSIS controller"—despite having nothing to do with DOCSIS. Quite simply, showing that the DOCSIS controller described in the '775 patent and Rabenko's voice and

data processor potentially share one function (but not others), does not demonstrate that Rabenko's voice and data processor is a DOCSIS controller.

2. A "DOCSIS Controller" Must Control At Least One Or More DOCSIS Functions.

Petitioner's failure of proof should be more than sufficient to reject the asserted grounds. If any more were needed, Petitioner's grounds should further be rejected because Rabenko's "voice and data processor" simply has nothing to do with DOCSIS and therefore cannot be a "DOCSIS controller." Indeed, the claims recite a "**DOCSIS** controller" rather than simply a controller. *Becton Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1257 (Fed. Cir. 2010) ("Claims must be 'interpreted with an eye towards giving effect to all terms in the claim.'"); *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004) ("[A]ll claim terms are presumed to have meaning in a claim.").

And, as Dr. Russ explains, a "DOCSIS controller" has a plain meaning that is clear on its face. A "DOCSIS controller" **controls DOCSIS functions**:

As the name "DOCSIS controller" itself indicates, a "DOCSIS controller" controls DOCSIS functions. "DOCSIS" stands for "Data Over Cable Service Interface Specifications." *E.g.*, Ex. 1001 ['775] 1:24-26. DOCSIS is the "standard for broadband cable transmission of IP data services" and "enable[s] bidirectional communications between a cable modem termination system (CMTS) in the cable

headend and a subscriber's cable modem (CM)." Ex. 2010 [Rohde-Schwarz] 1.

Ex. 2008 [Russ-2nd-Decl.] ¶ 43. That a "DOCSIS controller" must control DOCSIS functions is also fully consistent with and supported by the intrinsic record. Per Dr. Russ:

The '775 patent's disclosure relating to the "DOCSIS controller" is entirely consistent with the plain meaning and further confirms that a "DOCSIS controller" must control DOCSIS functions. The exemplary DOCSIS controller described in the specification "implements the following DOCSIS (blocks 200-212) functions" and then lists several examples of possible DOCSIS functions. Ex. 1001 ['775] 3:26-38. These functions may include "MAC management message (MMM) processing ..., ICMP, MAC address learning, classification, US protocol filtering ... and CM IP stack and software downloading." *Id.* These are all typical DOCSIS functions. *E.g.*, Ex. 2011 [DOCSIS-2.0] 7, 16, 286 (describing MAC management messaging); Ex. 2009 [Kiaei-Depo.] 24:12-27:11 (all functions listed in blocks 200-212 relate to functions "that are carried out in the DOCSIS protocol"). Thus, controlling/implementing "DOCSIS functions" is what makes a "DOCSIS controller" a DOCSIS controller. The examples provided in the specification are, in this regard, examples of DOCSIS functions that may be controlled by the "DOCSIS controller."

Ex. 2008 [Russ-2nd-Decl.] ¶ 44. Thus, a “DOCSIS controller,” consistent with the plain meaning and the specification, must control DOCSIS functions.

The ID, again, appears to have misapprehended Patent Owner’s position to be that the claimed DOCSIS controller must perform all of the specific functions listed in the ’775’s specification. ID, 14 (“we decline to limit the claim term ‘DOCSIS controller’ to a controller performing the specific functions identified by Patent Owner in the ’775 patent Specification.”). That is not and has never been Patent Owner’s position. Rather, as stated above and in the POPR, the claimed DOCSIS controller must control DOCSIS functions. This does not mean that it must control **all** DOCSIS functions or all DOCSIS functions identified in the specification.

Moreover, VoIP functions are distinct from DOCSIS functions. In accord, and as Dr. Russ further explains, the ’775 patent distinguishes between DOCSIS functions and VoIP functions and, consequently, handling VoIP functionality is not what makes a DOCSIS controller a DOCSIS controller:

VoIP is not a DOCSIS function. Indeed, the DOCSIS specification does not define or provide for any VoIP functionality. *See* Ex. 2011 [DOCSIS-Standard] *generally*. There may be DOCSIS networks—such as a typical home cable television network—that have no VoIP services. Similarly, there may be VoIP networks—such as a wired ethernet network—that does not use the DOCSIS protocol. Put

simply, DOCSIS and VoIP are simply two different protocols with different functions.

While the '775 patent does describe that the “DOCSIS controller implement[s] VoIP functionality” (*id.*, 2:6-11), it distinguishes between DOCSIS and VoIP functionality and specifies that “**DOCSIS and** VoIP functionality is provided by a cable modem engine” which the DOCSIS controller is a part of (*id.*, 2:21-24). And, as can be seen throughout the specification, the DOCSIS controller may implement **both** DOCSIS functions **and** VoIP functions. *Id.*, 3:26-38 (listing “DOCSIS functions” performed by the DOCSIS controller), 3:39-41 (DOCSIS controller “**also** implements all PacketCable functionality”); 4:19-21 (similar). But, what makes the DOCSIS controller a DOCSIS controller is not its VOIP functionality but, rather, its control of DOCSIS functions. Consequently, simply “processing and transporting voice over packet based networks” as Petitioner alleges (Pet., 31) without also implementing DOCSIS functionality is not enough to teach a “DOCSIS controller.”

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 47-48. Thus, VoIP functions are different from DOCSIS functions and that Rabenko’s voice and data processor allegedly implements VoIP functions does not demonstrate that it controls DOCSIS functions.

3. Petitioner Fails To Prove That Rabenko’s Voice And Data Processor Performs Any DOCSIS Functions.

Tellingly, Petitioner does not attempt to show that Rabenko's voice and data processor controls any DOCSIS functions. See Pet., 31. Nor could it. Rabenko's voice and data processor has nothing to do with DOCSIS. As Dr. Russ explains, Rabenko's voice and data processor processes signals over a Plain Old Telephone System (POTS) to a conventional telephone, not DOCSIS signals:

Rabenko's voice and data processor has nothing to do with DOCSIS functions. Rather, as can be seen in the figure below, Rabenko's **voice and data processor** communicates with the "**POTS telephone 108** via the **[subscriber line interface circuit] 109**":

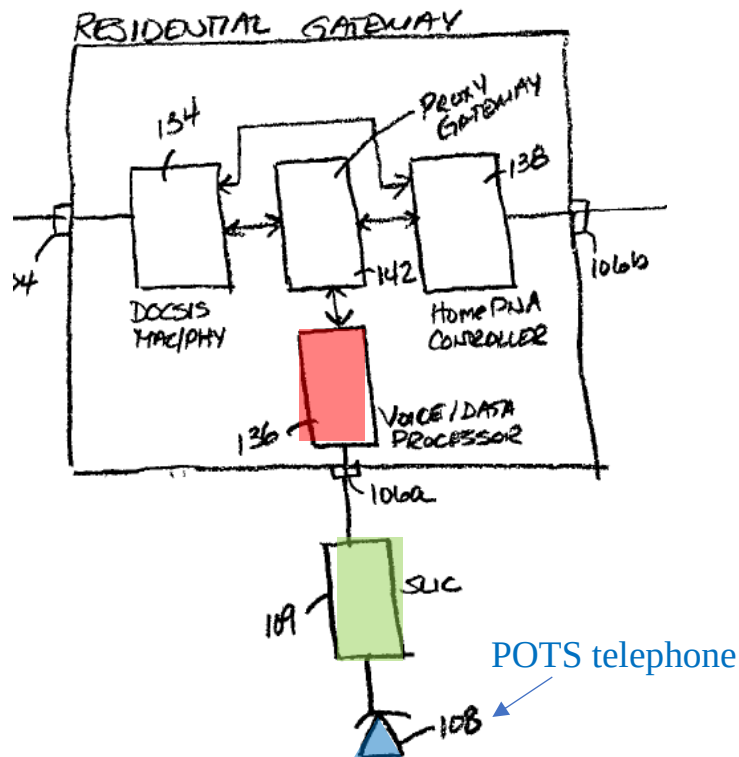


FIG. 1b

Ex. 1005 [Rabenko] Fig. 1b (annotated), [0045].

Rabenko's voice and data processor 136 is not used for any DOCSIS functionality. Rather, it is used to process the POTS signals to and from a conventional telephone. Ex. 1005 [Rabenko] Fig. 1b, [0032], [0034], [0045]. Specifically, the voice and data processor receives "packets ... *destined for the POTS telephone*," "decompress[es] and depacketiz[es]" those packets, and "generates an analog voice signal" for the POTS telephone. Ex. 1005 [Rabenko]

[0034], [0045]. These functions are not DOCSIS functions. *Compare id. with* Ex. 1001 [’775] 3:26-38; *see* Ex. 2009 [Kiaei-Depo.] 63:6-14 (POTS refers to “conventional telephone system that is a twisted pair”).

Ex. 2008 [Russ-2nd-Decl.] ¶ 52.

POTS signals are, moreover, very different from DOCSIS signals. Per Dr.

Russ:

POTS and DOCSIS relate to entirely different technologies. POTS refers to the system used for conventional telephone calls and dial-up internet and is much older than the cable systems for which DOCSIS is used. *See* Ex. 1005 [Rabenko] [0032]. Indeed, POTS typically use twisted-pair wires which could only physically support narrow bandwidths at low frequencies. *See* Ex. 2009 [Kiaei-Depo.] 63:6-14 (POTS refers to “conventional telephone system that is a twisted pair”); 65:15-22 (“conventional phones are phones that” receive signals over “a twisted pair in a -- in an analog form.”); Ex. 2012 [Signal-Integrity] 107, 112-115, 121. By contrast, DOCSIS is used for modern cable systems which support cable television and broadband internet. This is because coaxial cables can physically transmit large amounts of data over wide bandwidths at higher frequencies. Ex. 2012 [Signal-Integrity] 82.

Ex. 2008 [Russ-2nd-Decl.] ¶ 53.

To be sure, while Rabenko describes a residential gateway processing DOCSIS signals, the voice and data processor has nothing to do with DOCSIS.

As Dr. Russ explains, Rabenko as a whole is directed towards separating out and funneling data that is ultimately relevant to different functionalities (*e.g.*, data to be transmitted on a LAN versus data related to conventional POTS telephone calls) to the appropriate location:

Rabenko's voice and data processor processes telephonic signals for conventional telephone calls rather than data packets destined for transmission over the Home LAN. Indeed, Rabenko's purpose is to separate multiple types of signals entering a house and direct each one to its respective destination, including the home LAN and the conventional telephone. Rabenko's overall system deals with data destined for a variety of different types of endpoints (which can process different types of signals), including packetized data meant for media terminal adaptors over a home LAN as well as data that is converted into signals that a Plain Old Telephone System (POTS), or conventional telephone, can process. This is because Rabenko addresses issues when "existing in home wiring is limited in many cases to a single wire pair," and it is "both expensive" and "disruptive" to install additional wires. Ex. 1005 [Rabenko] [0003]. As a solution, Rabenko teaches a "telecommunications system" "to support telephony and other services in the home using existing wire pairs already installed in the home." *Id.*, [0031].

Ex. 2008 [Russ-2nd-Decl.] ¶ 55.

To this end, Rabenko employs a "residential gateway" that routes communications to a HomePNA controller and a conventional telephone. Per Dr.

Russ:

To process the variety of network services meant for various terminals entering the home, Rabenko uses a “residential gateway.” Ex. 1005 [Rabenko] [0032]. The residential gateway processes DOCSIS signals in addition to telephonic signals, and “convert[s] the physical media and protocols used for the IP network to the physical media and protocols used on the home wire pairs.” *Id.*, [0033]. These protocols include DOCSIS “for delivery of broadband services ... to the network port” **and** “a baseband protocol to deliver POTS [(Plain Old Telephone Service)] to a conventional telephone 108.” *Id.*, [0033]-[0034].

Thus, as can be seen in the figure below, the residential gateway processes, separates, and directs incoming **DOCSIS** and **POTS** services to their intended destinations—media terminals via the home LAN or the conventional telephone.

**Rabenko Only Routes POTS Signals—Not DOCSIS Signals—
Through Its Voice And Data Processor To A POTS Telephone**

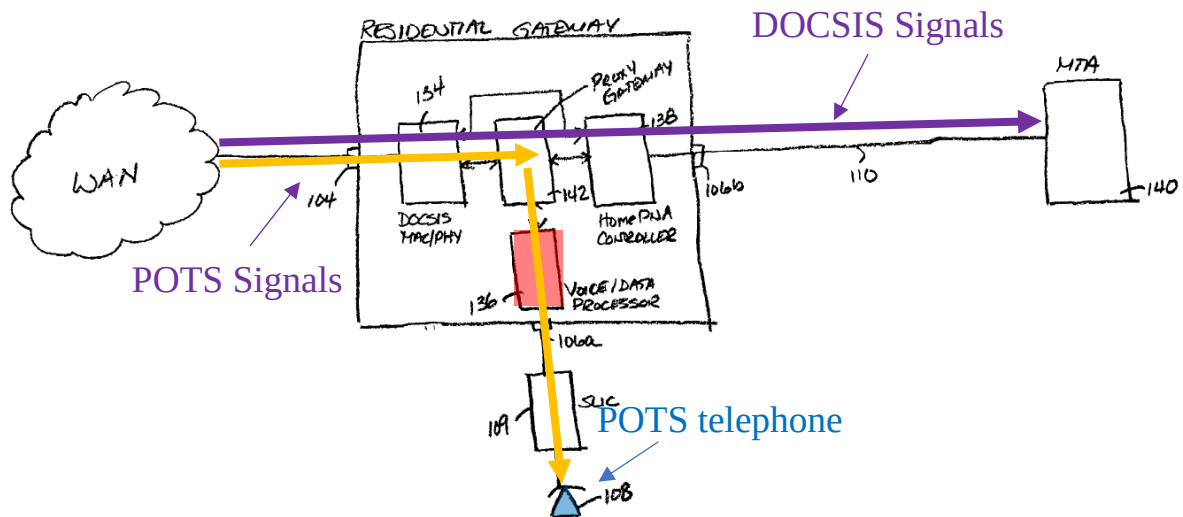


FIG. 1b

Ex. 1005 [Rabenko] Fig. 1b (annotated). As can be seen above, the **voice and data processor 136** processes signals intended for the POTS telephone rather than the home LAN. In other words, Rabenko's voice and data processor is on an entirely separate path from DOCSIS signals and thus is irrelevant to DOCSIS. Indeed, it could be removed entirely and the DOCSIS path would continue to function normally.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 56-57.

Because Rabenko's voice and data processor is used for baseband POTS signals rather than broadband DOCSIS signals over a cable network, it is irrelevant to DOCSIS functionality and cannot be a "DOCSIS controller." Thus,

for this additional reason, Petitioner fails to demonstrate that Rabenko discloses a “DOCSIS controller.”

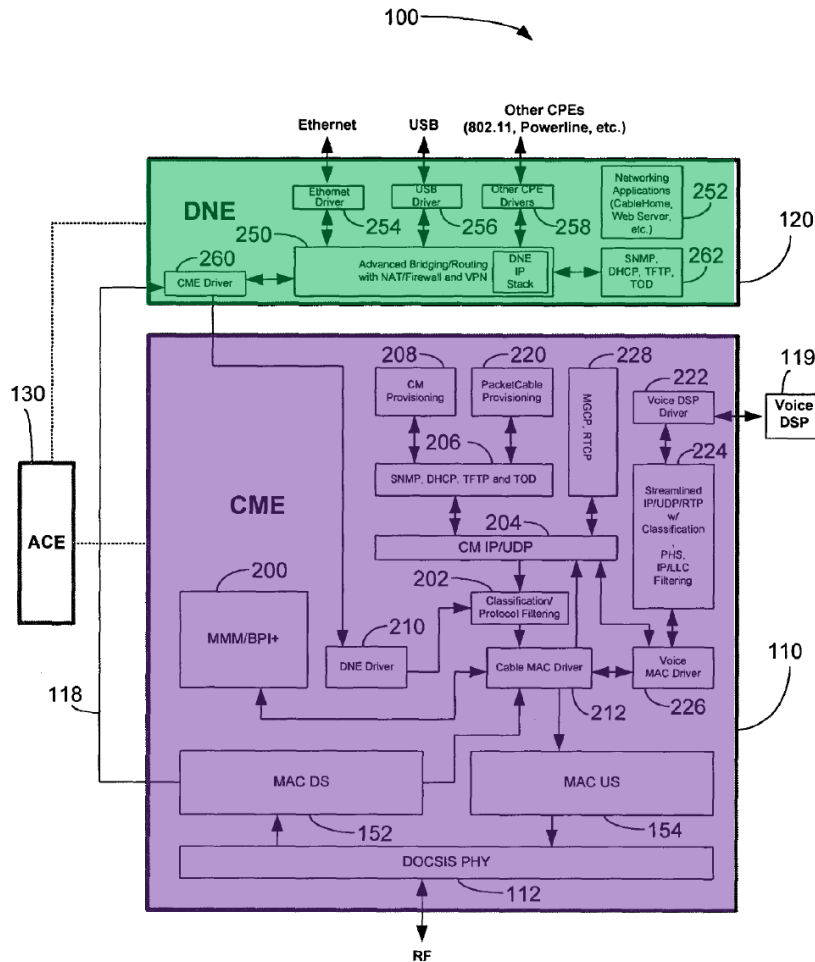
B. Petitioner Fails To Show That Rabenko Teaches A “Data Networking Engine” And “Cable Modem Engine” In “Separate” “First” And “Second” “Circuits” With “Completely Partitioned” Functions (1[b],[c],[e]/ 14[b],[c],[d]/18[b],[c],[g], All Claims, All Grounds).

The ’775 patent, in significant part, is directed towards a sharp and clear division between data networking functions and cable modem functions. This division is reflected in the claims which require a “data networking engine” (“DNE”) implemented in a “first circuit” and a “cable modem engine” (“CME”) implemented in a “second circuit,” “the second circuit being *separate* from the first circuit.”² Ex. 1001 [’775] cls. 1[b]-[c], 14[b]-[c], 18[b]-[c].

These claim elements are clearly reflected in the ’775 patent’s disclosure which clearly illustrates a **DNE implemented in a first circuit** that is separate

² In the ID, the Board’s analysis appeared to only address whether Rabenko discloses a data networking *engine* that is functionally partitioned from a cable modem *engine*. ID, 25-28, 38-39. Even supposing, *arguendo*, that Rabenko disclosed a DNE that is functionally partitioned from a CME, Petitioner has not demonstrated that Rabenko discloses a DNE on a first *circuit* that is *separate* from a CME on a second *circuit*.

and partitioned from a **CME implemented in a second circuit**. This is particularly clear in the '775 patent's Figure 2:



Ex. 1001 ['775] Fig. 2 (annotated); Ex. 2008 [Russ-2nd-Decl.] ¶¶ 62-64.

As Dr. Russ explains, the specification describes a separate and partitioned DNE and CME that are further implemented in separate processors:

In the Figure 2 embodiment of the '775 patent, the CME and DNE are implemented in separate processors 110 and 120, respectively. *Id.*, 4:17-19, 4:25-27. In accord, the '775 patent further makes clear that that the CME and DNE are separate and partitioned.

Id., 2:24-27 (“The data networking engine is partitioned from the cable modem engine so that the data and home networking functionality is completely decoupled from the DOCSIS and VoIP functionality.”); Abstract (“A cable modem engine performs all cable modem functions, and a data networking engine performs all data and home networking functions. The cable modem engine is completely partitioned from the data networking engine.”); 4:13-19 (“Cable modem 100 completely partitions data networking functions ... from DOCSIS cable modem functionality. This is accomplished by localizing data networking functions in the data networking engine processor and localizing cable modem functions in the cable modem engine processor.”); 4:25-27 (“Since the data networking and cable modem functions are decoupled and implemented in different processors 110 and 120, independent software upgrading and maintenance of these functions is feasible.”).

Thus, the exemplary Figure 2 and its corresponding written description unmistakably discloses a CME on a separate circuit from a DNE and, indeed, implemented on separate processors 110 and 120.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 63-64.

Rabenko, however, is another matter entirely and reveals no separation between the alleged DNE and the alleged CME. As Dr. Russ explains:

Whereas the ’775 patent clear identifies a DNE in one circuit that is separate and partitioned from a CME implemented in a second circuit, there is no such delineation in Rabenko. Rabenko discloses

neither a DNE nor a CME much less a DNE and CME implemented in separate circuits with the cable modem functions completely partitioned from the data networking functions.

Id., ¶ 65.

Bereft of any disclosures in Rabenko concerning a DNE in one circuit separate from a CME implemented in another circuit partitioned from the first, Petitioner resorts to arbitrarily identifying certain elements of Rabenko and proclaiming them to be a DNE and CME, respectively. Specifically, Petitioner argues that “Rabenko discloses HomePNA controller 138 [] that, along with AFE 226, functions as the” DNE and “are the claimed ‘first circuit.’” Pet., 14, 16. Petitioner then argues that “Rabenko discloses that DOCSIS MAC 134/212 [], a proxy gateway 142 and voice/data processor 136/213 [] which are implemented in a second circuit performing cable modem functions according to the CableLabs Data Over Cable Service Interface Specification (DOCSIS).” *Id.*, 21. Petitioner seemingly argues that the circuits are separate because they have separate components. *Id.*, 23.

Petitioner contends that this partitioned, claimed structure is disclosed by Rabenko but wholly fails to prove it. Rabenko never identifies HomePNA controller 138 and AFE 226 as forming either a circuit or a data networking engine. Nor does Rabenko identify the DOCSIS MAC 134/212, proxy gateway,

and voice and data processor as forming a second circuit or a cable modem engine. Rabenko simply never mentions or suggests that these components are a part of any engine or are specific circuits. Ex. 2008 [Russ-2nd-Decl.] ¶¶ 66-67.

Nor does Petitioner even provide a foundation upon which to reach its conclusions for it fails to provide any criteria by which it or its expert were able to identify which components comprise each “circuit,” in violation of its obligations under 37 C.F.R. §§ 42.104(b)(1)-(5), or provide any coherent explanation for why a POSITA would identify the separate circuits Petitioner and Dr. Kiaei insist are present. Dr. Kiaei similarly asserts in a conclusory fashion and without further explanation that certain components are part of “separate” “first” and “second circuit[s].” Ex. 1002 [Kiaei-Decl.] ¶¶ 88, 112, 114-115. Again, Dr. Kiaei never tells us what a circuit is beyond implying that circuits are separate when they have separate components. *See id.* Dr. Kiaei’s conclusory testimony is precisely the sort of testimony the Board has rejected. *See, e.g., Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15-16 (Aug. 24, 2022) (precedential) (rejecting conclusory expert testimony where petitioner and expert failed to construe limitation-in-question).

Further, the notion that any *ex post hoc* identification of separate components could constitute a separate circuit would render the claim terms meaningless. As Dr. Russ explains:

Under Dr. Kiaei's initial interpretation of "separate" "circuit[s]," wherein circuits are considered separate when having separate components, any combination of components could be a circuit separate from the remaining components. Indeed, each component, being already separate from the other components, could be its own circuit, separate from the other component-circuits in Rabenko's Figure 2. Under this interpretation, therefore, Rabenko's Figure 2 would depict thousands upon thousands of possible separate circuits. This simply makes no sense and renders the recited "separate" "circuit[s]" meaningless.

Ex. 2008 [Russ-2nd-Decl.] ¶ 68.

Moreover, during deposition, Dr. Kiaei also testified that, as used in the '775 patent's claims, a "circuit could include a processor, a software, and other components that perform[] the functions required" and that circuits are separate when "they are functionally separate." Ex. 2009 [Kiaei-Depo.] 96:10-97:12. This deposition testimony is inconsistent with his prior testimony implying that circuits are separate merely when they have separate components. *Compare id. with* Ex. 1002 [Kiaei-Decl.] ¶ 114. But, under this deposition interpretation, Rabenko's voice and data processor is not part of the second circuit but is rather part of yet another separate circuit. As Dr. Russ explains, the voice and data processor does not perform any function in conjunction with the DOCSIS MAC/PHY. More

specifically, whereas the DOCSIS MAC/PHY implements the DOCSIS protocol, the voice and data processor processes signals for a POTS telephone:

Petitioner and Dr. Kiaei contend that Rabenko's voice and data processor and the DOCSIS MAC/PHY constitute a circuit but the DOCSIS MAC/PHY and the voice and data processor implement different and unrelated functions.

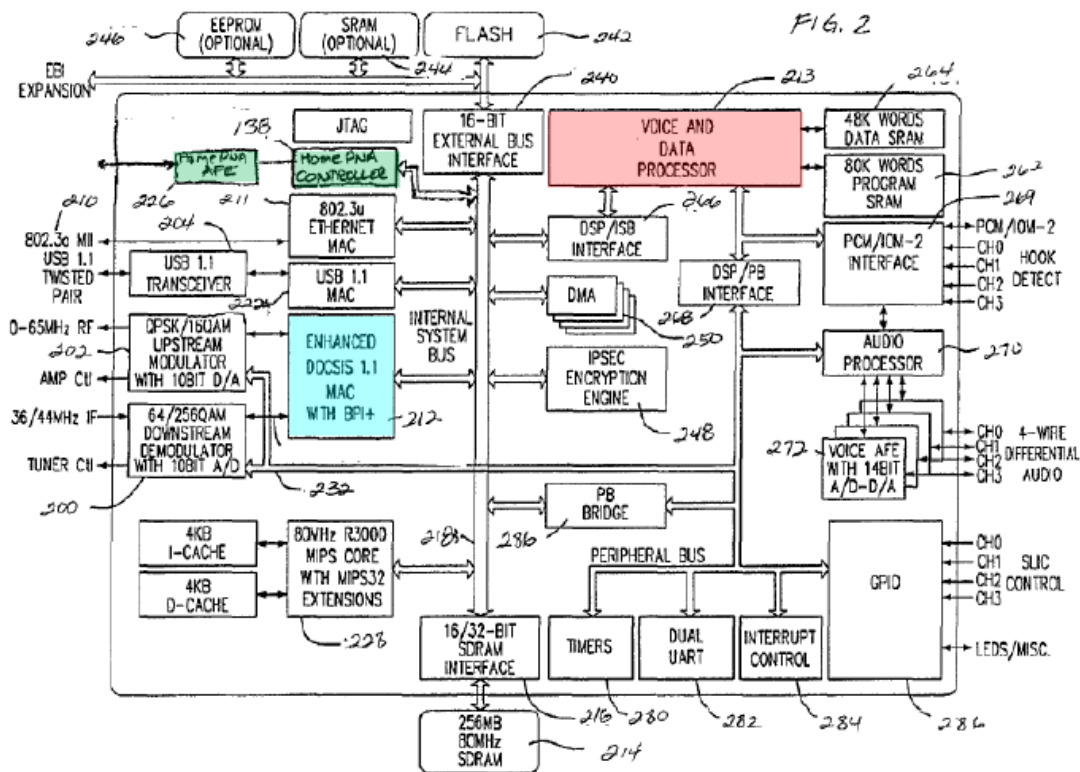
Rabenko's DOCSIS MAC/PHY "implements" both the "downstream" and "upstream portions of the DOCSIS protocol." Ex. 1005 [Rabenko] [0053], [0055]. These include "baseline privacy encryption and decryption as well as robust frame acquisition and multiplexing with MPEG2-TS compliant video and audio streams," "extract[ing] DOCSIS MAC frames from MPEG-2 frames, process[ing] MAC headers, and filter[ing] and process[ing] messages and data." *Id.*, [0053].

By contrast, the voice and data processor, as I explained earlier, processes signals for a POTS telephone. *Id.*, [0045]. In accord, Rabenko's voice and data processor does not implement portions of the DOCSIS protocol, but rather "decompress[es] and depacketiz[es]" voice packets to generate an "analog signal" for a POTS telephone. *Id.*, [0044]; *contrast with* Ex. 2011 [DOCSIS-2.0-Standard] (not mentioning analog or POTS) *generally*. Consequently, Rabenko's DOCSIS MAC/PHY and voice and data processor are functionally separate and thus are in separate circuits under Dr. Kiaei's interpretation.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 70-72.

Indeed, Petitioner's failure to demonstrate that Rabenko's DOCSIS MAC/PHY and voice and data processor belong on the same circuit is unsurprising. As Dr. Russ explains, Petitioner relies heavily upon Rabenko's Figure 2 but Figure 2 simply does not disclose a CME on one circuit and a DNE on another, separate circuit:

Rabenko's architecture is illustrated in the Figure 2 system block diagram, which Petitioner heavily relies upon. *See, e.g.*, Pet., 24, 35, 46, 47, 51, 52, 74. Neither Rabenko's Figure 2 nor its attendant description (*see* Ex. 1005 [Rabenko] [0009], [0050]-[0070]), however, disclose a CME in one circuit or a DNE in another, separate circuit. Petitioner and Dr. Kiaei provide the following annotated version of Figure 2 identifying (in part) the alleged circuits:



Ex. 1005, Fig. 2 (annotated)

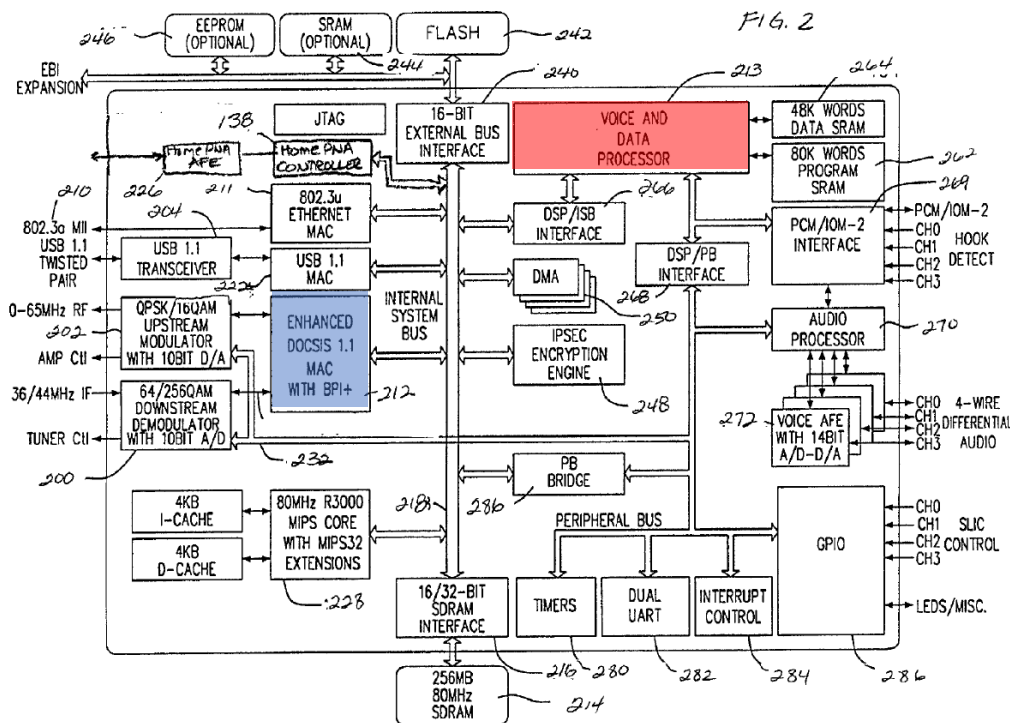
Pet., 23-24 (“Rabenko discloses that DOCSIS MAC 134/212 (blue), proxy gateway 142, and voice/data processor 136/213 (red) (‘second circuit’) are separate components from HomePNA controller 138 and AFE 226 [(green)] (‘first circuit’).”).

Ex. 2008 [Russ-2nd-Decl.] ¶ 73.

But, Petitioner’s identification of circuits is simply not supported by Figure 2 or Rabenko’s description. As Dr. Russ explains, there is no suggestion that the DOCSIS MAC/PHY and the voice and data processor form a circuit in Figure 2 and the two elements perform different functions on different signals:

Petitioner contends that the DOCSIS MAC (blue) and voice data processor (red) elements comprise the CME, but these elements are not depicted as being related and, indeed, are on separate sides of the internal system bus. I do not see how a POSITA reviewing Rabenko's Figure 2 would understand that these elements comprise a circuit:

Figure 2 Simply Does Not Suggest That The DOCSIS MAC/PHY And The Voice And Data Processor Form A Circuit



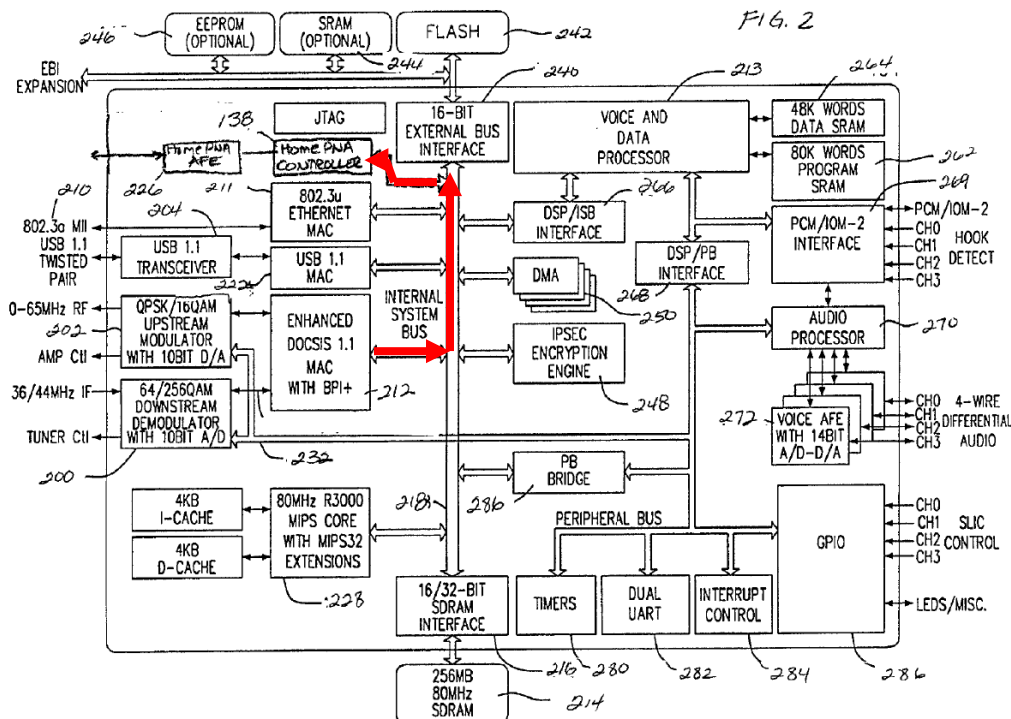
Ex. 1005 [Rabenko] Fig. 2 (annotated). This is particularly so as, previously discussed, the DOCSIS MAC/PHY (processing DOCSIS signals) and the voice and data processor (processing POTS telephone signals) perform entirely different and separate functions. See ¶ 56,

supra. And, again, the DOCSIS signals never even enter the voice and data processor. See ¶ 57, *supra*.

Ex. 2008 [Russ-2nd-Decl.] ¶ 74.

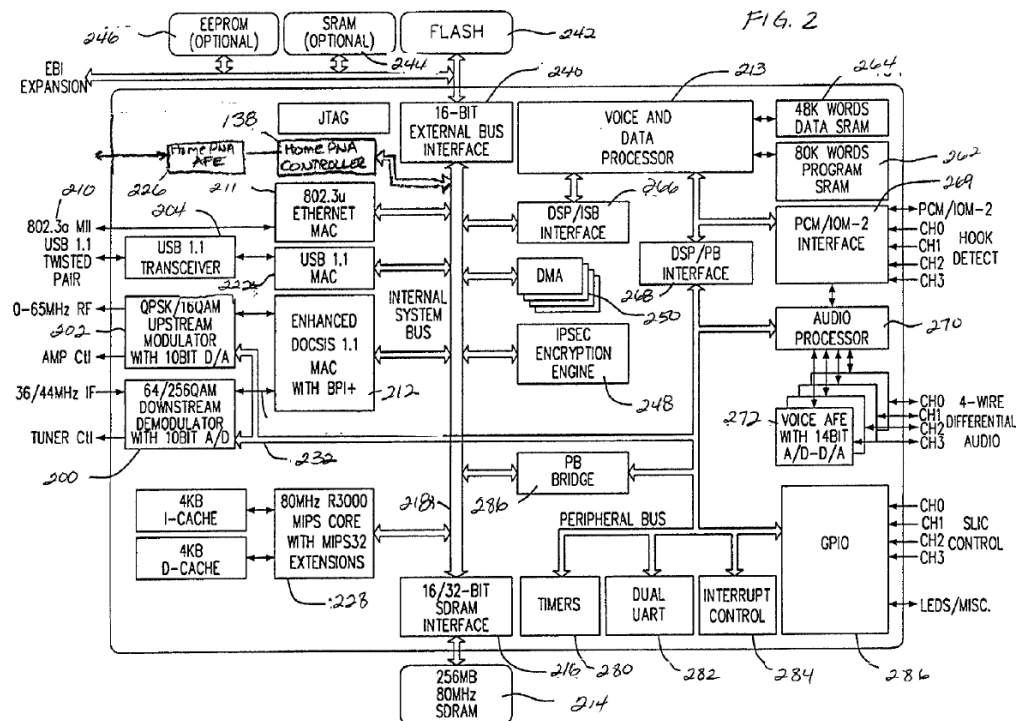
To the extent that Petitioner contends that a circuit is formed because a path may be drawn between the DOCSIS MAC/PHY and the voice and data processor, that logic suggests that the HomePNA controller is also part of the second circuit rather than the first circuit. As Dr. Russ explains:

While it is true that you can draw a path from the DOCSIS MAC to the voice and data processor, there is a more direct path from the DOCSIS MAC (allegedly part of the CME) to the HomePNA controller (allegedly part of the DNE), as can be seen below:



Ex. 1005 [Rabenko] Fig. 2 (annotated). Thus, to the extent that the DOCSIS MAC and voice and data processor form a circuit, there is no reason to believe that the more directly connected HomePNA controller is not also a part of the same circuit. It certainly does not suggest that the DOCSIS MAC/PHY and the voice and data processor form a circuit that is “separate” from the HomePNA controller.

In fact, as the unannotated version of Figure 2 reveals, it identifies no discrete, separate circuits, and the alleged circuits identified by Petitioner and Dr. Kiaei are merely after-the-fact identifications not rooted in the actual figure or its attendant description:



Ex. 1005 [Rabenko] Fig. 2.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 75-76.

Petitioner and Dr. Kiaei's reliance upon Figure 2 is even more inexplicable in view of Dr. Kiaei's apparent, material, misapprehension of Figure 2. During deposition, Dr. Kiaei was unable to identify how many circuits were present in the Figure 2 system block diagram because it allegedly did not necessarily illustrate hardware and instead could represent "purely [] software." See Ex. 2009 [Kiaei-Depo.] 39:8-40:12, 40:24-41:9. But, as Dr. Russ explains, Dr. Kiaei's analysis is inconsistent with Figure 2, which plainly depicts hardware elements:

... I respectfully disagree with Dr. Kiaei's deposition testimony that Rabenko's Figure 2 could represent "purely [] software." Among other things, it clearly depicts hardware components such as "16-bit external bus interface 240," "802.3u Ethernet MAC 211," "USB 1.1 MAC 222," "enhanced DOCSIS 1.1 MAC with BPI+ 212," and "80 MHz R3000 MIPS core with MIPS32 extensions 228" that are not software. Ex. 1005 [Rabenko] Fig. 2.

Ex. 2008 [Russ-2nd-Decl.] ¶ 78. And, even if, *arguendo*, Rabenko's Figure 2 only represented software, that would only confirm that it would not show circuits, just as the Board found in IPR2024-00579 (*see* Ex. 2013). As Dr. Russ explains:

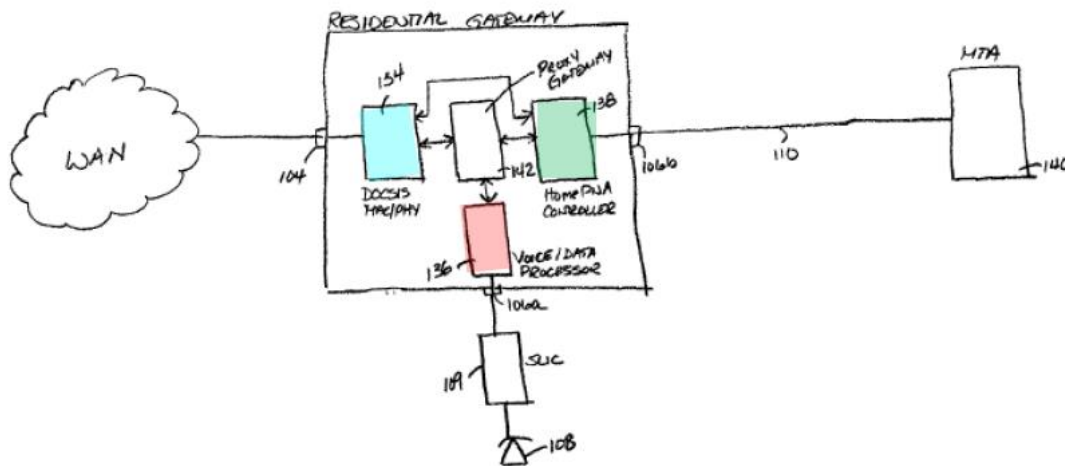
And, even if Figure 2 did represent "purely [] software," it would not support a conclusion that a CME and DNE are implemented in separate circuits. As the Board rightly found in the IPR2024-00579 noninstitution decision, a figure merely showing a logical separation of software would not show separate circuits. Ex. 2013 [579-DDI] 22

(“disclosure ... of a logical separation, that is a separation in software” does not “teach[] or suggest[] ‘the second circuit being *separate* from the first circuit’ (emphasis added).”). Consequently, Rabenko’s Figure 2 is similarly deficient, and the Board should rejection Petitioner’s Rabenko arguments for the same reasons.

Ex. 2008 [Russ-2nd-Decl.] ¶ 79.

Petitioner also points to Rabenko’s Figure 1b but, there too, does not demonstrate that this figure discloses a CME on one circuit and a DNE on another, separate, circuit. As Dr. Russ explains, Figure 1b in fact reveals a direct connection between the DOCSIS MAC/PHY (allegedly a part of the CME) and the proxy gateway (allegedly a part of the DNE) and only an indirect connection between the DOCSIS MAC/PHY and the voice and data processor (which together allegedly form the CME) that run through the proxy gateway:

As with Figure 2, Rabenko’s Figure 1b too does not depict a CME on one circuit and a DNE on a separate circuit. Petitioner contends that the **HomePNA controller 138** is part of the first circuit while the **DOCSIS MAC/PHY 134**, proxy gateway 142, and **voice/data processor 136** are on a second circuit:



Ex. 1005, Fig. 1b (annotated)

Pet., 21. But again, it is clear that the alleged circuits are merely after-the-fact identifications. As we can see from the figure above, there is a direct connection between the DOCSIS MAC (allegedly a part of the CME) and both the HomePNA controller (allegedly a part of the DNE). Why would a POSITA conclude these elements are on separate circuits that are partitioned from one another in view of these direct connections? Petitioner does not explain.

Why too would a POSITA conclude that the DOCSIS MAC forms a circuit with the voice and data processor that is “separate” from the HomePNA controller when both the DOCSIS MAC and the HomePNA controller are indirectly connected to the voice and data processor through the proxy gateway? In this regard there is a direct connection between the DOCSIS MAC/PHY (allegedly a part of the CME) and the HomePNA controller (allegedly a part of the DNE) while there is only an indirect connection between the DOCSIS

MAC/PHY and the voice and data processor (which collectively allegedly comprise the CME) that runs directly through the proxy gateway. Here too, there is no explanation.

If anything, by placing each of the HomePNA controller, DOCSIS MAC, proxy gateway, and voice and data processor in the residential gateway of Figure 1b, Rabenko, if anything, indicates that these elements are not separate or functionally partitioned from one another. Petitioner and Dr. Kiaei's identification of circuits is, thus, at best arbitrary and if anything, seems contrary to what Rabenko's Figures 1b and 2 actually suggest.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 81-83.

It is further unsurprising that Rabenko does not disclose the required separate circuits because it addresses a different problem than the '775 patent addresses. As Dr. Russ explains:

Rabenko, again, has an entirely different goal from the '775 patent's goal of a functionally partitioned architecture. Rather, Rabenko discloses a gateway configured to exchange voice and data packets between a network and multiple media terminal adapters in a home over a telephone line. Ex. 1005 [Rabenko] [0004], [0033]. Thus, Rabenko focuses upon "supporting multiple voice channels" on "a single wire pair." *Id.*, Title, [0003]-[0005], [0036], [0041]. Rabenko simply lacks the partitioning that is critical to the claimed inventions.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 84.

Thus, Petitioner fails to demonstrate a DNE implemented in a “first circuit” and a CME implemented in a “second circuit,” “the second circuit being separate from the first circuit” with “completely partitioned” functions.

C. Petitioner Fails To Demonstrate That Rabenko Alone Or In Combination With Gaspar And/Or Kim Teaches A CME “Configured To Enable Upgrades To Its Software In A Manner That Is Independent Of Upgrades To The Software Of The” DNE (1[d]/14[c]/18[d], All Claims, All Grounds).

The claims require “the cable modem engine *configured to* enable upgrades to *its software* in a manner that is independent of upgrades to the software of the data networking engine.” Ex. 1001 [’775] cls. 1, 14, 18.

In the ID, the Board preliminarily found that, “for the purposes of institution,” this limitation was “taught by the combined teachings of Rabenko and Kim and Petitioner has provided sufficient reasoning to combine those teachings.” ID, 33. The arguments made during the preliminary institution stage, however, only focused on whether replacing hardware could constitute upgrading software in the abstract. But, as further explained below, Petitioner presents two secondary references that may suggest replacing (Kim) or upgrading the software (Gaspar) for a HomePNA controller, allegedly a portion of the DNE.

Thus, neither Kim nor Gaspar has anything to say about a CME or any component forming a part of the CME. Further, even if some or all Rabenko’s CME were replaced, that would not teach a “*cable modem engine configured to*

enable upgrades to its software in a manner that is independent of upgrades to the data networking engine.” Indeed, if Rabenko’s CME is in some sense upgraded by physically replacing its components (in view of Kim), it indicates that the CME in question is **not** configured to enable upgrades to its software. Read most generously, Petitioner’s arguments might at most suggest a system in which software is replaced by physically replacing the preexisting components and the software previously on them. See Section III.C.1.

Petitioner’s other theories fail as well. Petitioner implicitly concedes that Rabenko does not disclose this feature and asserts that it would be obvious to modify Rabenko to enable the CME configured to enable independent upgrades to its software in light of Gaspar. But Rabenko does not disclose or render obvious upgrading the software of the engines at all, let alone in the required independent fashion. See Section III.C.2. And Gaspar teaches upgrading components in the alleged DNE, not in the CME. See Section III.C.3.

1. Petitioner Fails To Demonstrate That Its Rabenko-Kim Combinations Render Obvious This Limitation.

The claim again require “the cable modem engine **configured to** enable upgrades to **its software** in a manner that is independent of upgrades to the software of the data networking engine.” Petitioner argues that adding Kim to

Rabenko or Rabenko-Gaspar³ would render it obvious to add “upgrades to [the CME’s] software in a manner that is independent of upgrades to the software of the [DNE].” Pet., 28. Petitioner’s argument suffers from multiple fatal flaws, including that (i) Kim has nothing to do with a CME or replacing any element of a CME, (ii) Petitioner provides no explanation for how Rabenko would be modified in view of Kim to render obvious a CME “configured to enable upgrades to its software,” (iii) Kim has nothing to do with “upgrading” software, as it is about replacing hardware, and (iv) even if Kim somehow suggested replacing some element of the hardware in Rabenko’s CME, nothing in Kim suggests modifying Rabenko’s CME such that it is “configured” to “enable upgrades to its software.”

Kim Has Nothing To Do With A CME. Kim involves replacing modular pieces of hardware potentially associated with a DNE, not the CME. Specifically, Kim teaches potentially replacing a (i) modular HomePNA controller (allegedly a part of a DNE) and (ii) a modular ADSL controller (which has nothing to do with a DNE or a CME). Petitioner’s combination relies upon these teachings of replaceable components to argue that “[i]ncorporating the modular design of Kim

³ Gaspar too does not disclose or render obvious this limitation (in combination with Rabenko or Rabenko/Kim) for the additional reasons discussed in Section III.C.3.

would allow the efficient updating of any of Rabenko's partitioned components."

Pet., 30.

Thus, for starters, Kim's teachings do not even relate to a CME and, at most, may relate to a portion of a DNE. Kim, at most, suggests replacing the HomePNA controller, allegedly a part of Rabenko's DNE. Kim suggests nothing at all with respect to its alleged CME. Ex. 2008 [Russ-2nd-Decl.] ¶ 89.

Petitioner Does Not Explain How Rabenko Would Be Modified In View Of Kim To Render Obvious A CME "Configured To Enable Upgrades To Its Software." Nor does Petitioner even explain how Rabenko would be modified in view of Kim to render obvious a CME "configured to enable upgrades to its software." Petitioner contends only that "Rabenko's **HomePNA controller** is independently upgradeable from other components (as taught in Kim), such as the DOCSIS MAC/PHY, proxy gateway, and voice/data processor." Pet., 30. That Rabenko allegedly could be modified such that its HomePNA controller—a component in the alleged DNE—is purportedly "independently upgradeable from other components" does not suggest that components in the alleged **CME** are similarly independently upgradeable from the components in the DNE. Thus, Petitioner at best contends that the DNE could be independently upgraded vis-à-vis the CME. It does not, however, even argue that Rabenko/Kim would render obvious a **CME** "configured to enable upgrades to its software."

Kim Has Nothing To Do With “Upgrading” Software. Kim, again, at most suggests replacing two modular hardware components, neither of which has any connection to Rabenko’s alleged CME. Kim, further, has nothing to do with “upgrading” software. Kim mentions software only twice and in both instances it refers to sending a “software reset signal” in the context of rebooting Kim’s entire system. See Ex. 1007 [Kim] Fig. 4 (referencing “Software reset signal”); [0048] (“A system reset part 116 generates power starting reset signal, a hardware reset signal, and a software reset signal, and transmits them to the CPU 111.”). Thus, Kim, at best, suggests “resetting” software in the context of a power reboot and has nothing whatsoever to do with “upgrading” software.

Critically, Kim contains no suggestion that replacing its modular hardware would result in any software change, much less a software “upgrade.” Ex. 2008 [Russ-2nd-Decl.] ¶¶ 91-92. Kim does not disclose what software (if any) would be included on or correspond to the replacement hardware and does not suggest that any such software would be an upgrade to what went before. See *id.* In other words, even if physically swapping a hardware component could theoretically satisfy the claimed requirement of a “software upgrade,” nothing in Kim suggests that its hardware replacements would or could be used for such a purpose. Thus, Kim has nothing to do with “upgrading software.”

Even If, Arguendo, Kim Motivated A POSITA To Replace Some Or All

Of the Hardware In Rabenko’s CME It Still Would Not Satisfy The Claim.

Kim, thus, at most suggests replacing one hardware component of a DNE. It has no teachings relating to either a CME or to “upgrading” software. Nothing in Kim or Rabenko or the combination thereof suggests (i) replacing a CME, in whole or in part, (ii) replacing and/or upgrading the software associated with the CME, or (iii) making that upgrade “independent” of any upgrades to the DNE.

But even if we were to imagine that Kim, somehow, would motivate a POSITA to replace one or more components in Rabenko’s alleged CME, that ***still*** would not satisfy the limitation. The limitation does not merely require a CME that may be replaced (in whole or in part) and wherein, as a by-product of that replacement, the software is somehow “upgraded.” Rather, the limitation requires a “cable modem engine ***configured to*** enable upgrades to ***its*** software.” In other words, the claim requires that cable modem engine hardware—whose software is being upgraded—itself be configured to enable such an upgrade.

If anything, Petitioner’s reading of Kim suggests the opposite of this. Under Petitioner’s reading (see Pet., 28-30), Kim suggests ***replacing*** the CME in order to carry out the claimed upgrade. In this scenario, the ***CME*** is ***not*** “configured to enable upgrades to ***its*** software” or to do anything else—the CME is instead physically removed and replaced with a different piece of hardware. Ex. 2008 [Russ-2nd-Decl.] ¶ 93. Indeed, if the CME were “configured to enable

upgrades to its software” as claimed, there would be no need to physically replace it, as Kim suggests, because the CME would itself be capable of carrying out the upgrade. *Id.*, ¶ 94. As Dr. Russ explains, this is a fundamentally different process than what is claimed in the patent. Replacing software via new hardware results in new software on new hardware, not “**upgrades to *its* software.**” *Id.*, ¶ 95. Thus, replacing software by replacing hardware simply does not meet the claims. *Id.*

Certainly, Federal Circuit precedent would not suggest that replacing hardware (and corresponding software) to be the same thing as “configuring” the CME to enable upgrades to its own software. The Federal Circuit has found that the ordinary meaning of “configured to” is “programmed to.” *Nevro Corp. v. Boston Sci. Corp.*, 955 F.3d 35, 42 (Fed. Cir. 2020); *see also Alcon Inc. v. AMO Dev., LLC*, IPR2021-00853, Paper 48, 21 (Dec. 2, 2022) (“In the context of such computer systems, the ordinary meaning of ‘configured to’ refers to programming (setting parameters) to allow the computer to perform some function.”) (citing *Alice Corp. Pty Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 224 (2014); *Nevro*, 955 F.3d at 41; *iRobot Corp. v. ITC*, 767 Fed. App’x 944, 946-47 (Fed. Cir. 2019)). In other instances, that court has considered “configured to” to be synonymous with “designed to.” *See, e.g., Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (“[T]he phrase ‘adapted to’ is most naturally

understood to mean that the arms and magnetic members are designed or configured to accomplish the specified objective, not simply that they can be made to serve that purpose.”); *see also In re Man Mach. Interface Techs. LLC*, 822 F.3d 1282, 1286 (Fed. Cir. 2016) (distinguishing “configured to” from broader terms like “capable of” or “suitable for”).

Petitioner, however, does not contend that Rabenko’s CME is configured or programmed or designed to enable upgrades to its **own** software; nor is there any indication that replacing the hardware of the CME in some undefined way would result in a CME that is “configured to” enable upgrades to its software. Petitioner does not suggest, for instance, that Kim’s HomePNA controller, once replaced, is configured to enable upgrades to its software. Even if we were to assume, *arguendo*, that Rabenko’s CME were modified to be removable, in whole or in part, that would not mean that the existing CME or the new, replaced CME, is configured to enable upgrades to its software.

This distinction between replacing hardware and configuring a CME to upgrade its software is consistent with the ’775 patent’s specification. The ’775 patent discloses that configuration of the CME to enable upgrades to its software independent of upgrades to the DNE’s software is “highly desirable” because of the resulting flexibility. As Dr. Russ explains:

The claims require that the CME be “**configured to enable upgrades** to ***its* software** in a manner that is independent of upgrades to the software of the data networking engine.” Ex. 1001 [’775] cls. 1, 14, 18. This feature allows for flexibility so that upgrades can be implemented with minimum impact on the overall system. *Id.*, 4:10-57. Specifically, independent upgradability of the software of the DNE and CME is “highly desirable” because it allows the system to “independently provision, maintain and upgrade revenue-producing gateway services and basic broadband access services ... with minimum impact on the cable modem.” *Id.*, 1:37-1:40.

Ex. 2008 [Russ-2nd-Decl.] ¶ 97.

The ’775 patent further teaches that the desired “flexibility” is achieved when software is upgraded **without** replacing the hardware. As Dr. Russ explains:

The ’775 patent explains that “flexibility” means that “independent software upgrading and maintenance” of the data networking and cable modem functions “is feasible.” Ex. 1001 [’775] 4:25-28. More specifically, the inventive systems can use “different software-partnering models, such as complete in-house development, software-components licensing and [original equipment manufacturer (‘OEM’)] vendor-differentiating design.” *Id.*, 4:28-32. In other words, the software on the gateway cable modem can be easily upgraded by a variety of parties without involvement from the cable modem provider, including outside third-party software companies. *See also id.*, 4:32-36 (“In particular, data networking engine 120 provides third parties and OEMs with a dedicated computational

platform to develop advanced services outside of the baseline cable modem and VoIP/PacketCable services, minimizing their support dependency on the cable modem provider.”). If upgrading software were achieved through replacing components, it would prevent third-party vendors from easily providing software upgrades, as those vendors would need to replace the hardware component in each cable modem—even if the hardware itself does not need to be changed. Consequently, consistent with the claim language, the configuration of the CME to enable upgrades to its software does not encompass merely physically replacing the CME or its components.

Ex. 2008 [Russ-2nd-Decl.] ¶ 98. Thus, even if Rabenko were modified in view of Kim to replace certain hardware in the CME, that would not teach, suggest, or render obvious a CME “configured to enable upgrades to its software.”

2. Petitioner Fails To Demonstrate That Rabenko Alone Discloses And/Or Renders Obvious Upgradability Of Software.

Petitioner contends that Rabenko alone renders obvious configuring the alleged CME to “**enable upgrades** to its software ... **independent of upgrades** to the software of the” DNE. Pet., 26-27. Petitioner concedes that Rabenko does not expressly disclose (and does not argue that it implicitly discloses) that its purported DNE’s and CME’s software may be upgraded independently, but instead points to Rabenko’s statement that “[s]killed artisans recognize the interchangeability of hardware and software under these circumstances, and how

best to implement the described functionality for each particular application,” and asserts that “[a] POSITA would have understood that [independent upgradability] would have been ***obvious to try*** because, ***when faced with implementing the upgradability of Rabenko’s data networking engine and cable modem engine, there are only a few finite options***: to configure them to be updated together or separately.” Pet., 26-27 (quoting Ex. 1005 [Rabenko] [0268]). Other than asserting this obvious-to-try theory, Petitioner makes no assertions about what motivation a POSITA would have to modify Rabenko’s purported engines to enable independent upgradability of their software, nor does it make any assertions as to what reasonable expectation of success a POSITA may have. Petitioner’s argument fails.

As an initial matter, Petitioner fails to substantiate its “obvious to try” conclusion with any substantive citations to the prior art. Petitioner cites only Rabenko’s boilerplate statements that it “may be implemented in any number of way including electronic hardware, computer software, or combinations of both ... depend[ing] upon the particular application and design constraints imposed on the overall system” and that “[s]killed artisans recognize the interchangeability of hardware and software,” as noted above. Pet., 26-27 (citing Ex. 1005 [Rabenko] [0268]). This conclusory analysis is legally insufficient. *See Magnum Oil Tools*, 829 F.3d at 1380; *Xerox*, IPR2022-00624, Paper 9, 15 (precedential) (“[T]he cited

declaration testimony is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight.”); *Virtek Vision Int’l. ULC, v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 887, n.2 (Fed. Cir. 2024) (declarant’s “conclusory assertions ... do not provide substantial evidence for finding a motivation to combine.”).⁴

Further, nothing whatsoever in Rabenko suggests upgrading the software of either the CME or the DNE, much less upgrading the software independently. Petitioner’s obviousness argument over Rabenko alone, thus, is an attempt to establish obviousness in the face of a missing limitation.

Finding obviousness of a “missing limitation” going to the “heart of the invention,” however, requires a “searching” analysis that cannot be supplied by conclusory statements or general conclusions about “basic knowledge” or “common sense.” *Arendi S.A.R.L. v. Apple, Inc.*, 832 F.3d 1355, 1362-63 (Fed. Cir. 2016); *K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1366 (Fed.

⁴ Petitioner’s citations to Dr. Kiaei’s declaration at ¶¶ 122-123 (Pet., 27) do not discuss Dr. Kiaei’s reasoning, and is an improper attempt to incorporate Dr. Kiaei’s testimony by reference. *See* 37 C.F.R. § 42.6(a)(3); *3M Co*, 860 Fed. App’x. 724, 725-728 (Board properly declined to consider improperly incorporated testimony).

Cir. 2014) (“[T]he Board cannot accept general conclusions about what is ‘basic knowledge’ or ‘common sense’ as a replacement for documentary evidence for core factual findings in a determination of patentability.”) (citation omitted); *DSS Tech. Mgmt. v. Apple Inc.*, 885 F.3d 1367, 1374-75 (Fed. Cir. 2018) (“common sense” can supply a missing limitation “only when ‘the limitation in question was unusually simple and the technology particularly straightforward.’”).

This is precisely such an instance. As discussed in the preceding section, partitioning the CME and DNE and making the software of each independently upgradeable goes to the heart of the invention because it enhances “flexibility” and “performance” and is “highly desirable.” See Section III.C.1, Ex. 1001 [’775] 1:30-47, 4:25-40; Ex. 2008 [Russ-2nd-Decl.] ¶ 102.

Petitioner, however, falls well short of the high bar for establishing obviousness in the face of a significant missing limitation. Importantly, Petitioner’s argument rests upon the infirm premise that Rabenko’s software may be upgraded at all. Rabenko is silent on such upgradability, and for good reason: its purported CME includes “embedded” software that is not upgradeable, let alone modifiable to be “independent[ly]” upgradable as claimed.⁵ As further

⁵ Petitioner articulates no argument that upgradable software is inherent in

explained below, Rabenko describes its software as “embedded software” which is generally not upgradeable. Ex. 2008 [Russ-2nd-Decl.] ¶¶ 104-107.

Petitioner argues that it would be “obvious to try” to modify Rabenko to enable the claimed independent upgradability because there were “only a few finite options” for updating Rabenko’s software. Pet., 27. But obviousness cannot be shown based on a mere disclosure that the “possible arrangement[] existed in the prior art.” *Virtek*, 97 F.4th 882, 887 (“The mere fact that these possible arrangements existed in the prior art does not provide a reason that a skilled artisan would have substituted the one-camera angular direction system in Kietler and Bridges with the two-camera 3D coordinate system disclosed in Briggs.”). Petitioner must still show a reason to modify the prior art specifically to add the missing limitation. *See id.* Nowhere does Petitioner explain why a POSITA would be motivated to modify Rabenko in this manner, much less how.

Petitioner’s argument falls under one of the “classes of situations where ‘obvious to try’ is erroneously equated with obviousness under § 103.” *In re Kubin*, 561 F.3d 1351, 1359 (Fed. Cir. 2009). “Obvious to try” cannot show obviousness if it is merely a proposal to “vary all parameters or try each of

Rabenko, which would require that it is “necessarily present.”

numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of ***which parameters were critical*** or ***no direction*** as to ***which of many possible choices is likely to be successful.***” *Id.* (citing *In re O’Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988)). When the prior art lacks such direction, it results in “hindsight claims of obviousness” that “courts should not succumb to.” *Kubin*, 561 F.3d at 1359.

Petitioner relies on just such hindsight. It simplifies the ’775 patent’s innovations to two “finite options” of “configur[ing] [Rabenko’s DNE and CME] to be updated together or separately.” Pet., 27. But it is not so simple. Petitioner relies upon the premise that the CME and DNE are “separate and independent.” Pet., 26-27. So rather than the “finite” set of only two options that Petitioner asserts exist, based on the supposed presence of the DNE and CME, the correct “obvious-to-try” analysis is that there were many—perhaps uncountable—possible combinations of Rabenko’s many components, illustrated in its Figure 2, which could be grouped together in innumerable ways, each of which could be upgradeable or not and, if upgradeable, upgradeable in various ways.

“Obvious to try” also fails “where vague prior art does not guide an inventor toward a ***particular solution.***” *Bayer Schering Pharma AG v. Barr Labs., Inc.*, 575 F.3d 1341,1347 (Fed. Cir. 2009). Obviousness is not shown where “what was ‘obvious to try’ was to explore a new technology or general

approach that seemed to be a promising field of experimentation, where the prior art ***gave only general guidance as to the particular form of the claimed invention or how to achieve it.***” *Kubin*, 561 F.3d at 1359 (citing *O’Farrell*, 853 F.2d at 903). Again, Petitioner does not argue that Rabenko teaches even “general guidance,” much less guidance towards a “particular solution,” of configuring the CME to enable upgrades to its software in a manner independent of upgrades to the DNE’s software.

In fact, there is no reasonable expectation of success in adding this independent upgradability based on Rabenko’s teachings. As noted above, Rabenko suggests no upgradability to, at the very least, the purported CME if not the entire system. Several of its components, two of which are of the purported CME, are “embedded.” As Dr. Russ explains:

Rabenko discloses that the voice and data processor and the proxy gateway of the purported CME, use “embedded software.” *E.g.*, Ex. 1005 [Rabenko] [0074] (“The ***voice and data processor 213*** may be implemented with a variety of technologies including ... ***embedded communications software***”), [0075] (“The ***embedded communications software*** is preferably run on a programmable digital signal processor (DSP).”), [0089] (“An ***exemplary voice and data processor*** may be implemented...”), [0091] (“The exemplary programmable DSP is effectively hidden within the ***embedded communications software layer***.”), [0097] (“the proxy gateway

function is implemented with ***embedded software***”), [0122] (“The interaction of an ***exemplary embedded MTA call client*** and the MTA 140 ...”). Indeed, Petitioner itself refers to Rabenko’s voice and data processor as being implemented with “embedded communications software.” Pet., 25.

Ex. 2008 [Russ-2nd-Decl.] ¶ 104.

Embedded software, however, is generally not upgradable. As Dr. Russ explains:

It was well-known that upgrading “embedded” software (at least without changing the hardware that is used) generally is impossible or at least difficult. For instance, “key features of embedded systems” may include the following:

For their ***lifetime***, they ***perform the same duty***. For example, an MP3 player will only play MP3s.

...

Users are ***unable to change or update embedded systems***. They must have good dependability and stability ratings. The user shouldn’t have any problems using them for extended periods.

Ex. 2005 [IoT].

Such “embedded” software is generally rigid and fixed, incapable of being upgraded without replacing or modifying the accompanying hardware. Ex. 2005 [IoT] (“An embedded system is an

integration of programmable software and hardware that may have ***fixed capabilities.***”); Ex. 2004 [Monarch] (“Once an embedded system is developed [y]ou are ***not able to alter, enhance or upgrade.***”). Ex. 2005 [IoT] (“Because embedded systems are sometimes related to certain hardware platforms, ***upgrading the system without changing the hardware can be difficult.***”). Upgrading embedded software would require a facility for accessing, verifying, extracting, and installing the upgraded software. At the time, these facilities required another processor and other software, or possibly special hardware or a specialized software “bootloader.” Such upgrades generally interrupt normal operation of the software in question while they occur and require careful design and testing.

Ex. 2008 [Russ-2nd-Decl.] ¶¶ 105-106. Thus, Petitioner fails to establish that a POSITA would have a reasonable likelihood of success in modifying Rabenko’s embedded software to be upgradeable. *Id.*

Moreover, to the extent Petitioner argues so, there is no reason to modify Rabenko such that it does not use embedded software. As Dr. Russ explains:

Any modification to Rabenko such that it would no longer use embedded components would require substituting new hardware instead of upgrading the software independently of it. There is no reason a POSITA would have had a reason to do this. Embedded systems offer many advantages over other types of systems, which Petitioner does not acknowledge, let alone address. Ex. 2005 [IoT] (Embedded systems “may be less expensive,” “can be very small and

compact,” “can be very trustworthy,” “they are energy-efficient,” and are customizable (*i.e.* “are adaptable to the particular needs of the application”)); *see* Ex. 2006 [Monarch] (“An embedded system is a specialized computer system designed to perform dedicated functions within a larger system” and “are often optimized for low power consumption, compact size, and high reliability to meet the requirements of their intended applications.”); *id.* (“Because an embedded system generally plays a role ***that does not change its requirements***, the requirements for an operating system ***aren’t as burdensome***”). Given these advantages, any changes to Rabenko’s embedded software may have unforeseen consequences to the performance of the rest of Rabenko’s system.

Ex. 2008 [Russ-2nd-Decl.] ¶ 107.

Because Rabenko’s voice/data processor and proxy gateway, components of the purported CME, are “embedded,” there is no reason to conclude that Rabenko would be configured such that those components of the CME, which must be “configured to enable upgrades to its software,” could even be upgraded, much less enabled “in a manner that is independent of upgrades” to the DNE software as the claims require.

Thus, Rabenko does not disclose or render obvious configuring its purported CME to enable upgrades to its software in a manner that is independent of upgrades to the software of the purported DNE.

3. Petitioner Fails To Demonstrate That Its Rabenko-Gaspar Combinations Render Obvious This Limitation.

Petitioner also argues that it was obvious to try adding independently upgradeable software in view of Rabenko in light of Gaspar. But, similar to Kim, Gaspar merely contemplates upgrades for the HomePNA controller of the alleged DNE, and does not teach upgrading software for **any** components of the CME, much less independently of software for the DNE. Moreover, Gaspar does not teach upgrading embedded software, such as the software in Rabenko.

Petitioner argues that Rabenko-Gaspar renders obvious configuring the CME to enable upgrades to its software in a manner that is independent of upgrades to the DNE software because Rabenko’s HomePNA “would have to be frequently updated or replaced,” citing Gaspar’s disclosure of an upgradable DNE HomePNA controller. Pet., 27-28. But Gaspar’s teachings apply only to the alleged DNE, not the CME. As Dr. Russ explains:

Petitioner appears to use Gaspar to provide a “motivation to modify” Rabenko to enable upgradability of the **HomePNA controller**, a component of the DNE. See Pet., 27-28. Even if, for the sake of argument, Gaspar’s teachings were applied to Rabenko, they only address upgrading the HomePNA controller of the DNE, not the CME, and there is no indication that its teachings could be applied to the CME. Gaspar does not teach altering the alleged CME components (*e.g.*, voice and data processor or DOCSIS MAC/PHY) such that they

are upgradable, much less teach that components be configured to be independently upgradable from other components in a system. Gaspar solely concerns partitioning the HomePNA controller itself “[b]y partitioning the MAC and PHY circuits” and independently upgrading those portions of it. Ex. 1006 [Gaspar] [0014].

Ex. 2008 [Russ-2nd-Decl.] ¶ 110. Thus, Petitioner fails to demonstrate that Gaspar teaches modifying Rabenko’s CME to teach the claims.

Petitioner also fails to address that Gaspar does not teach upgrading the HomePNA controller in a manner independent from the software of a CME. Gaspar’s disclosure of “partitioning the MAC and PHY circuits” in its “HPNA controller” so “the controller circuit can be debugged or upgraded by modifying the MAC circuit, leaving the PHY circuit intact” (Ex. 1006 [Gaspar] [0014] (cited at Pet., 28)) is at most a teaching about upgrading different parts of one component of the DNE independently, not upgrading the software of the CME independently from that of the DNE as claimed. Ex. 2008 [Russ-2nd-Decl.] ¶ 111.

Thus, Petitioner has failed to show that any grounds achieve the “independent upgradability” as required by the claims.

D. Petitioner Fails To Demonstrate That “All” Of Rabenko’s “DOCSIS Functions Are Localized” In Its Alleged “Cable Modem Engine” (Claims 2, 19, Grounds A-D).

Claims 2 and 19 require that “*all DOCSIS functions are localized in the cable modem engine.*” Petitioner asserts this limitation is met because “[t]he claimed ‘all DOCSIS functions’ are the functions performed by the components of the cable modem engine in Rabenko.” Pet., 39. Petitioner identifies Rabenko’s “DOCSIS MAC 134/212 [], a proxy gateway 142 and voice/data processor 136/213” (*id.*, 21) and “[MIPS] core 228” as comprising the CME. *Id.*, 24. Petitioner, however, fails to show “all DOCSIS functions” are “localized in” Rabenko’s purported CME because Petitioner fails to account for Rabenko’s QPSK out of band downstream demodulator 206 (“QPSK demodulator”), which performs DOCSIS functions but is not even alleged to be a part of the CME.

Petitioner asserts that “[t]he claimed ‘all DOCSIS functions’ are the functions performed by the components of the cable modem engine in Rabenko” because “Rabenko’s DOCSIS MAC 134/212 performs cable modem functions according to the CableLabs DOCSIS.” Pet., 39. Petitioner then argues that the list of functions performed by the DOCSIS MAC 134/212 and the “translation of the packet format and determination of whether a packet payload is voice or data are the claimed ‘all DOCSIS functions.’” *Id.* Allegedly, these “functions are both performed by DOCSIS MAC 134/212 and are localized in Rabenko’s cable

modem engine.” *Id.* Petitioner also asserts that “Rabenko’s voice and data processor”—the alleged “DOCSIS controller”—“is used for processing and transporting voice over packet based networks.” Pet., 40.⁶ Petitioner then concludes that because the components in the alleged CME perform DOCSIS functions and because “Rabenko’s HomePNA controller 138 performs no DOCSIS functions,” all DOCSIS functions are localized in Rabenko’s purported CME. *Id.*

As an initial matter, Petitioner does not even attempt to show what the claims require. Assuming, *arguendo*, that all of the listed functions are indeed “DOCSIS functions,” simply showing that the functions performed by the CME components are DOCSIS functions and that a subset of Rabenko’s other components do not perform DOCSIS functions is not enough to show that “**all** DOCSIS functions are localized in the cable modem engine,” as the claims require. Moreover, the ’775 patent specification is clear that all DOCSIS functions should be localized within the CME. See Ex. 1001 [’775] 2:55-56 (“Cable modem engine 110 implements the **entire DOCSIS** cable modem

⁶ As discussed in Section III.A, Rabenko’s voice and data processor is not a DOCSIS controller, and it is not clear it should be considered a part of the Rabenko’s purported CME.

functionality...”), 4:13-16 (“Cable modem 100 **completely partitions** data networking functions ... from DOCSIS cable modem functionality. This is accomplished by ... **localizing** cable modem functions in the **cable modem engine** processor.”). Petitioner’s failure to address what the claims require is, alone, sufficient reason to reject Petitioner’s argument.

If more is needed, Petitioner does not even contend that Rabenko’s QPSK demodulator—which performs DOCSIS functions—is a part of the CME or any component of the CME. See Pet., 21-26 (discussing Rabenko’s purported CME). As Dr. Russ explains:

Rabenko’s QPSK out of band downstream demodulator 206 performs DOCSIS functions. As discussed, DOCSIS is the standard for transmitting data between the cable head-and a cable modem inside a residence. Ex. 2011 [DOCSIS] 1; see also Ex. 1005 [Rabenko] [0050] (“DOCSIS was developed to ensure that cable modem equipment built by a variety of manufacturers is compatible”). As Dr. Kiaei testified, DOCSIS functions at least relate to the DOCSIS specification. Ex. 2009 [Kiaei-Depo.] 24:12-27:11. Consistent with this, Rabenko’s “QPSK out of band downstream demodulator 206 is configured to receive out of band MPEG-2 encoded message from the cable head end.” Ex. 1005 [Rabenko] [0050]; Ex. 2011 [DOCSIS-2.0] 13 (defining QPSK), 62 (discussing using QPSK modulation), 72 (similar). Note that this comports with my design of DOCSIS-enabled set-top boxes – the QPSK demodulator functions as a control path by

which the CMTS can send information to the cable modem without requiring the use of the “in-band” path normally reserved for Internet traffic. Thus, Rabenko’s QPSK out of band downstream demodulator 206 performs DOCSIS functions. Notably, neither Petitioner nor Dr. Kiaei allege that the QPSK out of band downstream demodulator 206 is part of the alleged CME. See Pet., 21-26.

Ex. 2008 [Russ-2nd-Decl.] ¶ 120.

Petitioner thus fails to account for Rabenko’s QPSK out of band demodulator, and, therefore, fails to demonstrate that Rabenko teaches that “all DOCSIS functions are localized in the cable modem engine.” To the extent that Petitioner attempts to argue in its Reply that Rabenko’s QPSK out of band demodulator is part of the alleged CME, the Federal Circuit has repeatedly held that Petitioner must make its case in the petition. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“[T]he expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute.”); *Wasica Fin. GmbH v. Cont’l Auto. Sys.*, 853 F.3d 1272, 1285-1286 (Fed. Cir. 2017) (rejecting reply’s new theory of obviousness, explaining that “[s]hifting arguments in this fashion is foreclosed by statute, [court] precedent, and Board guidelines.”); see *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1330-1331 (Fed. Cir. 2019) (rejecting reply’s modification of combination); see also CTPG, 73 (Nov. 2019) (“Petitioner may

not submit new evidence or argument in reply that it could have presented earlier, e.g.,] to make out a prima facie case of unpatentability.”). Any attempt to cure the oversight in the Petition would be untimely.

E. Petitioner Fails To Demonstrate That “The DOCSIS MAC Processor Is An ARM9TDMI-Based RISC Processor” And That “The DOCSIS Controller Is An ARM940-Based RISC Processor” (Claim 12, Grounds I-P).

Claim 12 requires that “the DOCSIS MAC processor is an ARM9TDMI-based RISC processor” and that “the DOCSIS controller is an ARM940-based RISC processor.” As the Board correctly observed, “Petitioner acknowledges ‘none of Rabenko, Gaspar, [or] Kim ... specifically recite an ARM9TDMI-based or an ARM940-based RISC processor.’” ID, 41 (quoting Pet., 56). Petitioner instead argues that “a POSITA would have found it obvious to implement the functions of the DOCSIS MAC processor and DOCSIS controller” using the recited processors. Pet., 56-57. Alternatively, Petitioner argues that “[i]t would have been obvious for a POSITA to implement the DOCSIS MAC functions of Rabenko using an ARM9TDMI-based RISC processor as taught by Klein and the DOCSIS controller functions of Rabenko using an ARM940-based RISC processor as taught by Kim ’678.” *Id.*, 60. Petitioner fails to demonstrate either alternative.

The Board correctly noted that “we question whether Petitioner has sufficiently demonstrated that the further recitation in claim 12 would have been an obvious design choice in view of the teachings of Rabenko, Gaspar, Kim, and Lu.” *Id.*, 41. Indeed, Petitioner simply fails to point to any DOCSIS MAC processor implemented as an ARM9TDMI-based RISC processor in the art. *See* *Pet.*, 56-62. Similarly, Petitioner does not provide any evidence of a DOCSIS controller implemented as an ARM940-based RISC processor in the art. *Id.* Rather, Petitioner points to Rabenko’s boilerplate language that its “various illustrative logical blocks, modules, circuits, and algorithm steps” “may be implemented in any number of way[s] including electronic hardware, computer software, or combinations of both” to conclude that implementing Rabenko’s DOCSIS MAC/PHY and DOCSIS controller in “a specific commercially-available RISC processor[] would have been an obvious design choice.” *Pet.*, 57-58 (citing Ex. 1005 [Rabenko] [0268]). But Rabenko does not teach that its system may be implemented by just any hardware—let alone the specific hardware recited in the claim. Rather, Rabenko merely states that certain functions may be implemented by hardware and/or software. Ex. 1005 [Rabenko] [0268]. Nothing in Rabenko indicates that using an ARM9TDMI-based RISC processor for the DOCSIS MAC/PHY or an ARM940-based RISC processor for

the DOCSIS controller would be an obvious design choice. Ex. 2008 [Russ-2nd-Decl.] ¶¶ 123-124.

Petitioner’s reliance upon Klein and Kim ’678 is equally flawed. As an initial matter, neither Klein nor Kim ’678 are analogous art. “A reference qualifies as prior art for an obviousness determination . . . only when it is analogous to the claimed invention.” *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011). An obviousness ground that relies upon non-analogous art fails. *Id.*, 1352. “Petitioner bears the burden of showing by a preponderance of evidence that the asserted prior art references are analogous art.” *SCHOTT Gemtron Corp. v. SSW Holding Co., Inc.*, IPR2013-00358, Paper 106, 26 (Aug. 20, 2014); *In re Nat. Alts., LLC*, 659 Fed. App’x. 608, 613-14 (Fed. Cir. 2016) (nonprecedential).

To be analogous, a reference must be either (1) from the same field of endeavor as the patent-at-issue, or (2) reasonably pertinent to the particular problem with which the inventor of the challenged patent is involved. *In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992). Petitioner, however, fails to argue let alone prove that Klein or Kim ’678 are analogous under either prong. The ’775 patent’s field is “a cable modem system having a functionally partitioned and flexible architecture.” Ex. 1001 [’775] 1:5-10. By contrast, Klein’s field is “semiconductor digital circuitry implementing a pipelined dynamically reconfigurable instruction set processor (Ex. 1016, [0002]), and Kim ’678’s field

is “systems integrated on a semiconductor chip” (Ex. 1015, [0001]-[0002]). Thus, Klein and Kim ’678 are not from the same field of endeavor as the ’775 patent.

Nor are Klein or Kim ’678 reasonably pertinent to the problem the ’775 patent seeks to address. The ’775 patent is directed towards “[t]he major challenge in designing” a gateway cable modem integrating “a wide range of data networking and VoIP services” “with the basic cable modem functionality in an efficient and cost-effective [manner].” Ex. 1001 [’775] 1:13-18. On the other hand, Klein seeks to address “the limitations of ASICs, FPGAs, and CPUs” as the “conflicting design goals have strained the capabilities of traditional semiconductor technologies and chip architectures.” Ex. 1016 [Klein] [0003]-[0008]. Similarly, Kim ’678 addresses “inefficiencies” in prior art schemes for system on a chip arbitration. Ex. 1015 [Kim ’678] [0012]-[0014], [0045]. Because Petitioner’s grounds as to claim 12 rely upon non-analogous art, they must be rejected.

If more is needed, Petitioner fails to demonstrate that a POSITA would have been motivated to combine Rabenko and Klein and Kim ’678 as proposed. Petitioner offers no proof that Klein or Kim ’678 are appropriate to perform the functions needed in Rabenko. *See* Pet., 59-61. Indeed, neither Klein nor Kim ’678 teach a DOCSIS MAC processor or a DOCSIS controller. *See* Exs. 1015,

1016. Rather, Klein and Kim '678 simply teach processors that have nothing to do with DOCSIS or cable modems at all. Ex. 2008 [Russ-2nd-Decl.] ¶¶ 126-128.

Thus, Petitioner fails to demonstrate that its combinations teach that “the DOCSIS MAC processor is an ARM9TDMI-based RISC processor” and that “the DOCSIS controller is an ARM940-based RISC processor.”

IV. CONCLUSION

Petitioner fails to demonstrate by a preponderance of the evidence that any of the claims are invalid.

Respectfully submitted,

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LOWENSTEIN & WEATHERWAX LLP

Date: December 10, 2024

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

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Respectfully submitted,

/ Colette Woo /

Date: December 10, 2024

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The undersigned hereby certifies that the following documents were served
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