

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COX COMMUNICATIONS, INC.,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

Case IPR2024-00579
Patent 8,223,775

PATENT OWNER'S PRELIMINARY RESPONSE

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2003	Declaration of Samuel H. Russ, Ph.D. [Russ-Decl.]
2004	Himanshu Arora, “Intro to DOCSIS Architecture, CM CMTS Protocol for Cable Modems” (May 11, 2012) (available at https://www.thegeekstuff.com/2012/05/docsis-introduction/) [https://www.thegeekstuff.com/2012/05/docsis-introduction/]
2005	David Fellows and Doug Jones, <i>DOCSIS Cable Modem Technology</i> , IEEE COMMUNICATIONS MAGAZINE, March 2001, at 202 [IEEE-Magazine]

Emphases are added unless otherwise stated.

I. INTRODUCTION

Institution should be denied because the Petition fails to show a reasonable likelihood of prevailing as to any challenged claim. Petitioner’s two grounds both fail for multiple, independently sufficient reasons.

Petitioner’s first ground, based on Schain and Thi, is far afield of the claims. Petitioner fails to show disclosure or obviousness of the required “cable modem engine including a DOCSIS controller” (Section III.A) or the “DOCSIS MAC processor configured to process...and forward...packets directly to the data networking engine without the involvement of the DOCSIS controller” (Section III.B). Petitioner also fails to show the disclosure of a “data networking engine [‘DNE’] implemented in a *first circuit*” and separately a “cable modem engine [‘CME’] implemented in a *second circuit*” as claimed. Section III.C.

Petitioner’s second ground fares no better. Its combinations of Perlman, Crocker, and Fox¹ are not shown to satisfy numerous limitations, including the required “processor” in each of the “first circuit” and “second circuit” to execute claimed software (Section IV.A); the CME being “configured to enable upgrades to its software...independent of upgrades to the software of the” DNE (Section

¹ At least one of these, Fox, cannot be a basis for obviousness at all, because it is not analogous art to the ’775 patent. Section IV.B.2.

IV.B); the “[CME] including a DOCSIS controller and a DOCSIS MAC processor,” where the “DOCSIS MAC processor [is] configured to process downstream PDU packets and forward the processed packets directly to the [DNE] without the involvement of the DOCSIS controller” (Section IV.C); the “data bus” connecting the CME and the DNE (Section IV.D); and the DNE “perform[ing] home networking functions including interfacing with customer provided equipment” (Section IV.E).

II. THE ’775 PATENT’S ADVANTAGEOUS PARTITIONED CABLE MODEM SYSTEM INCLUDES, AMONG OTHER ELEMENTS, A “DATA NETWORKING ENGINE” IN A “FIRST CIRCUIT” AND A “CABLE MODEM ENGINE” WITH A “DOCSIS CONTROLLER” AND “DOCSIS MAC PROCESSOR” IN A “SECOND CIRCUIT.”

The ’775 patent discloses a “future *gateway cable modem* (CM)” that “will incorporate a variety of functions beyond the traditional cable modem[.]” Ex.-

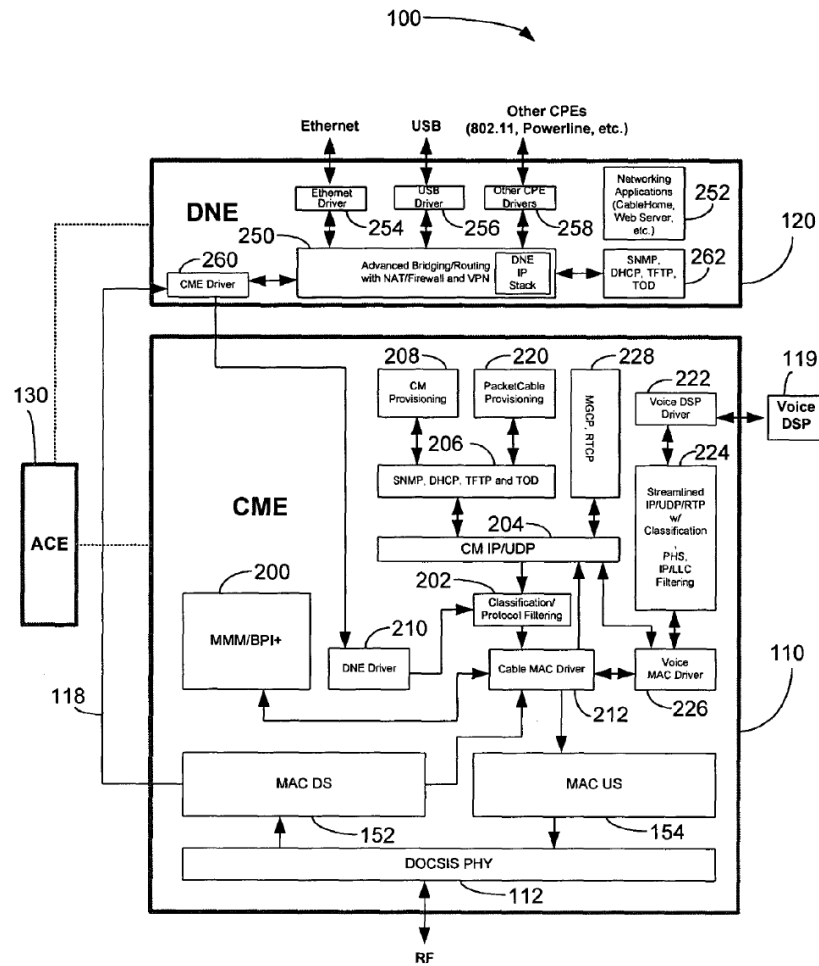
1001 [’775] 1:13, 1:20-22. As the Patent observes,

The major challenge in designing such a gateway cable modem is integration of these services with the basic cable modem functionality in an efficient and cost-effective [manner].

Id., 1:16-18. The Patent describes a variety of goals of the architecture of the invention, relating to, *e.g.*, “Functional Partitioning,” “Performance,” “Cost” and “Software Re-Use,” and how its novel “gateway cable modem architecture...meets all of these objectives.” *Id.*, 1:20-57.

The '775 patent's inventive gateway modem architecture is centrally based on separate "engines" with allocated functions. First is a data networking engine ("DNE") responsible for home networking functions—in short, for the part of the cable modem that will interface into networks on-premises—implemented in a "first circuit." Second is a cable modem engine ("CME") responsible for cable modem functions—the interface to communication outside the premises to the cable operator and on to the internet—implemented in a "second circuit." This interface implements the DOCSIS set of standards, and the CME includes both a DOCSIS MAC processor and a DOCSIS controller which perform distinct and specialized cable modem functions. Ex.-2003 [Russ-Decl.] ¶¶33-35.

The DNE and CME each are implemented in respective circuits, each include at least one processor, and are functionally partitioned from each other, as claimed: "the cable modem functions performed by the cable modem engine [CME] are completely partitioned from the home networking functions performed by the data networking engine [DNE]." Ex.-1001 ['775] cl. 18, 8:24-27. This careful partitioning is reflected in FIG. 2, showing the claimed functions of the gateway cable modem partitioned into DNE and CME:



Id., Fig. 2; Ex.-2003 [Russ-Decl.] ¶¶33-35.

The CME itself comprises several components, including a “DOCSIS MAC processor” and a “DOCSIS controller” for carrying out or controlling different portions of the functionality relating to DOCSIS-based communication.² The

² In the CME of FIG. 2, exemplary DOCSIS MAC functions are represented as blocks 152 and 154, Ex.-1001 [’775] 3:19-20, and exemplary DOCSIS controller functions as blocks 200-212, *id.*, 3:26-27.

inventive architecture allows for the DOCSIS MAC processor to be configured to process and forward downstream packets directly to the DNE without the involvement of the DOCSIS controller, boosting downstream throughput. Ex.-1001 [’775] 3:11-16, 8:18-22. FIG. 2 illustrates this in path 118, over which downstream packets may flow directly from downstream DOCSIS MAC 152 to the DNE without passing through any other component of the CME. *Id.*, 3:14-16. Meanwhile, the DOCSIS controller can “receive[]...PDU packets” from the DNE and “implements...DOCSIS...functions.” *Id.*, 3:21-27. This functionally partitioned system “enhanc[es]” “performance,” among other benefits. *Id.*, 4:43-55.

In sum, the challenged claims require a specified architecture with structural and functional requirements expressly recited in the claims. The Petition fails to show that its two grounds teach this architecture, including a DNE and CME implemented in a “first circuit” and “second circuit” respectively, a “DOCSIS MAC processor configured to process” and “forward” “downstream PDU packets” to the DNE “without the involvement of the DOCSIS controller,” and other missing elements. Sections III-IV. The cited art did not recognize that these goals and architecture (Ex.-1001 [’775] 1:19-55) were possible, much less aim to meet them.

III. SCHAIN AND THI DO NOT DISCLOSE OR RENDER OBVIOUS THE CLAIMS (ALL CLAIMS, GROUND 1).

As discussed above, the '775 patent advantageously teaches an inventive gateway cable modem system with, *inter alia*, a DNE and a CME implemented in first and second circuits respectively, and a CME with a DOCSIS controller and DOCSIS MAC processor, with the latter processor configured to forward packets directly to the DNE without involvement of the DOCSIS controller. Petitioner fails to show that Schain, Thi, or their combination discloses or renders obvious the claimed DOCSIS controller, Section III.A, much less one that can be bypassed by a DOCSIS MAC processor forwarding packets directly to a DNE without the DOCSIS controller's involvement, Section III.B. In addition, Petitioner further fails to show that what it identifies as the CME and DNE are disclosed to be on separate circuits. *See* Section III.C. Each of these failings is sufficient to reject Ground 1.

A. Schain Does Not Disclose The “Cable Modem Engine Including A DOCSIS Controller” (Limitation 18[h], All Claims).

Limitation 18[h] recites “the cable modem engine including a **DOCSIS controller**.” For this limitation, Ground 1 argues only that it is disclosed in Schain. Pet., 34. This argument fails for two independent reasons. **First**, Schain is not shown to disclose a “DOCSIS controller.” **Second**, its purported “DOCSIS controller” is not shown to be included in its purported CME (its “cable bridge,”

Pet., 29-30, 31-32). Under Petitioner’s own arguments, Schain’s purported DOCSIS controller is stored in Schain’s “cable applications layer,” which is not part of Schain’s “cable bridge.”

1. “A DOCSIS Controller”

First, Schain does not disclose the “DOCSIS controller.” Petitioner identifies no express mention of DOCSIS controllers in Schain. Instead, Petitioner relies solely on a mention by Schain of undescribed “specially designed controllers (not shown)” in its “broadband gateway 500,” contending that the POSITA “would recognize that one relevant ‘specialized controller’ would be a DOCSIS controller”:

Schain further discloses the broadband gateway 500 including specialized controllers, e.g., a DOCSIS controller: “Any required software support for the network connectivity could be provided in *** specially designed controllers (not shown).” Ex. 1005, ¶61; Ex. 1003, ¶90. Skilled artisans would recognize that one relevant “specially designed controller” would be a DOCSIS controller. Ex. 1003, ¶¶90-92 [sic]

Pet., 34.

Petitioner’s contention that the POSITA reading Schain would recognize that “one relevant ‘specially designed controller’ would be a DOCSIS controller” must be based on inherency, since Schain does not expressly disclose a “DOCSIS

controller” and Petitioner does not argue it would be obvious to add. Pet., 34.

Inherency faces a particularly high bar in this context, requiring that the limitation be “necessarily present.” *PAR Pharm., Inc. v. TWi Pharms., Inc.*, 773 F.3d 1186, 1195-1196 (Fed. Cir. 2014) (“the concept of inherency must be limited when applied to obviousness, and is present only when the limitation at issue is the ‘natural result’ of the combination of prior art elements,” *i.e.*, “necessarily present”). But Petitioner does not even contend, much less prove, that Schain’s unspecified, undescribed, un-shown “specially designed controllers” would ***necessarily*** include, specifically, a “DOCSIS controller” as claimed. This is itself sufficient reason to reject the Petition’s first ground.

If more were needed, nothing in Schain in fact suggests that its “specially designed controllers (not shown)” necessarily include a “DOCSIS controller.” Schain’s lone mention of these undescribed controllers comes in the context of “output connections for broadband gateway 500”:

[a]ny required software support for the network connectivity could be provided in the CPU 520, ***or in specially designed controllers (not shown)***. If the broadband gateway 500 supports wireless connectivity, then an appropriate wireless circuit 550 and an analog front end (AFE) 555, along with an antenna 560 would be present.

Ex.-1005 [Schain] [0063]; Pet., 34. This portion of Schain, however, does not even mention DOCSIS, much less a controller of DOCSIS functions. Petitioner

does not even articulate a reason, much less show, that one of these unspecified, not-shown controllers would be one that controls DOCSIS functions so as to meet the claimed “DOCSIS controller” of the CME.

2. “Includ[ed]” In The CME

Even if, *arguendo*, one of Schain’s not-shown “specially designed controllers” were a DOCSIS controller, Petitioner fails to show it is “included” in a CME as claimed. Schain’s conclusory mention of these undescribed controllers does not specify where they might be found, much less disclose that they are in Schain’s “cable bridge” (which Ground 1 alleges is the “CME,” *see* Pet., 29-32). Despite this lack of disclosure, Petitioner asserts that Schain’s supposed “‘DOCSIS controller’ is within the ‘cable applications layer.’” Pet., 35. Petitioner cites nothing in Schain to support this bare conclusion.

Even if, *arguendo*, Schain had a DOCSIS controller **and** it were in its “cable applications layer,” Petitioner has not shown it is in Schain’s alleged CME (the “cable bridge”). Petitioner does not address the fact that Schain’s **cable applications layer 325** is not shown to overlap with **cable bridge 315**:

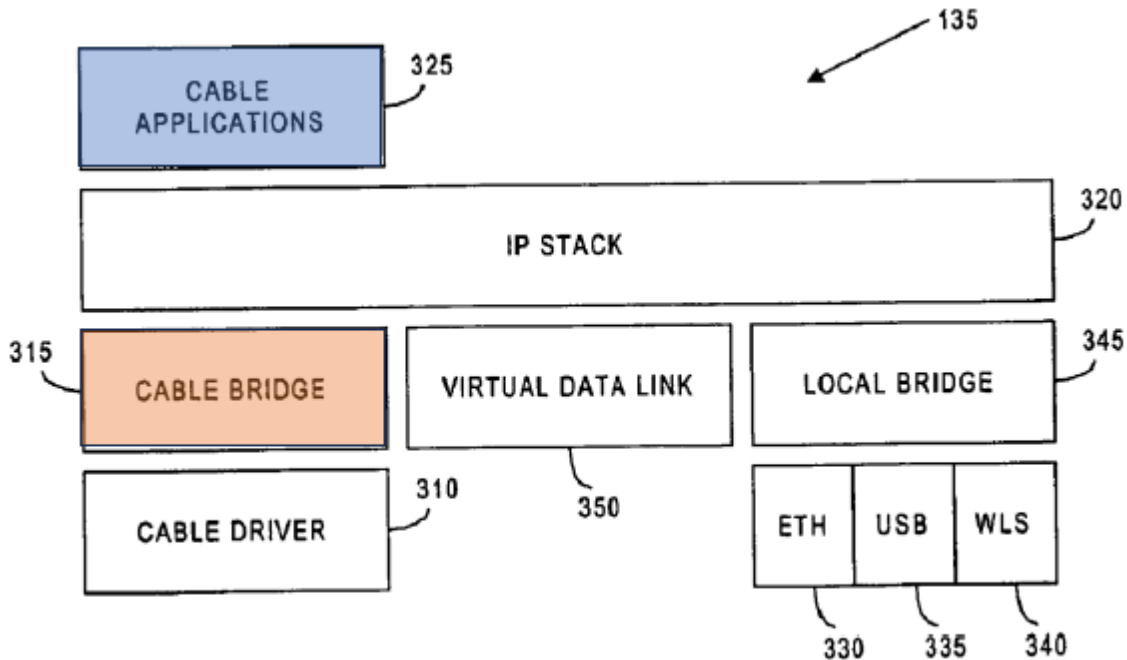


Figure 3

Ex.-1005 [Schain] Fig. 3 (annotated); *see also id.*, Figs. 2a-2b & 4, [0031]-[0032], [0037]-[0038], [0047]-[0048] (discussing positions of “cable applications layer” and “cable bridge”). Petitioner does not address Schain’s disclosure, but simply asserts the conclusion it would need to meet the claims.

For these reasons, Petitioner fails to show that Ground 1 discloses or renders obvious the claimed “cable modem engine including a DOCSIS controller.”

B. Schain And Thi Do Not Disclose Or Render Obvious A “DOCSIS MAC Processor Configured To...Forward The Processed Packets Directly To The [DNE] Without The Involvement Of The DOCSIS Controller” (Limitation 18[i], All Claims).

Not only does Ground 1 not show a “DOCSIS controller” (Section II.A *supra*), it does not show a “DOCSIS MAC processor configured to process

downstream PDU packets and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller” as limitation 18[i] also requires the CME to include.

The Petition asserts Schain discloses this limitation or, alternatively, that adding Thi to Schain renders it obvious. As a threshold matter, under 35 U.S.C. §325(d) this argument should not be considered, because in prosecution, Schain was already presented and overcome as to this limitation. Section III.B.1. Even if reconsidered, Schain is not shown to disclose a DOCSIS MAC processor in a CME configured to process and forward downstream PDU packets “directly” to a DNE without involvement of a DOCSIS controller. Section III.B.2. Adding Thi, which concerns neither a DOCSIS controller nor a DNE to forward packets to, does not change this fact. Section III.B.3.

1. Under § 325(d), The Panel Should Not Revisit The Examiner’s Correct Finding That Schain Does Not Teach Limitation 18[i].

Petitioner first asserts that Schain itself discloses limitation 18[i]. Pet., 35-36. However, Schain was already addressed and overcome in prosecution with respect to this very limitation, and no error in that determination has been shown.

Under 35 U.S.C. § 325(d), “the Director may take into account whether, and reject the Petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” *Advanced Bionics v. Med-*

El Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6, 8 (Feb. 13, 2020) (precedential). Under *Advanced Bionics*’ “two-part framework,” the Board first considers “whether the same or substantially the same art previously was presented to the Office” and, if so, “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Id.*

As to *Advanced Bionics*’s first part, it is undisputed this art previously was presented to the Office. Pet., 79-80. In prosecution, the Examiner rejected claims over a combination led by Schain, then withdrew that rejection and expressly found that Schain did **not** disclose “the DOCSIS MAC processor is configured to process downstream PDU packets and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput,” as 18[i] requires. Ex.-1002 [Pros.-Hist.] 72.

As to *Advanced Bionics*’s second part, Petitioner does not even argue the Examiner “materially erred” in finding Schain does not disclose or render obvious 18[i]. Pet., 79-80.

Thus, the panel needn’t reconsider whether Schain renders 18[i] obvious.

2. Petitioner, In Any Event, Does Not Show That Schain Discloses Limitation 18[i].

Even if, despite *Advanced Bionics*, Schain is reconsidered here, the Petition

fails to show Schain teaches 18[i]. Pet., 35-36 (arguing, *inter alia*, “Schain **discloses forwarding packets** between the two bridges.”) (citing Ex.-1005 [Schain] [0050]). Specifically, Petitioner fails to substantiate its assertion that “Schain discloses or at least implies that the PDU packets are transmitted directly from the cable bridge to the local bridge without involvement of the DOCSIS controller.” Pet., 36. Petitioner points to disclosure of transferring packets from a “source bridge” to a “destination bridge,” but fails to point to either disclosure or explanation of why such a transfer would have been performed such that the purported **DOCSIS MAC processor** processes and forwards downstream PDU packets at all, let alone **directly** to the purported DNE without involvement of the purported DOCSIS controller.

First, it is not shown that Schain’s purported **DOCSIS MAC processor** processes and forwards downstream packets to the purported DNE at all. The Petition’s argument here does not mention the DOCSIS MAC processor and merely asserts packets are “transferred from one bridge to the other bridge via the virtual data link 350” without explaining what this has to do with a purported DOCSIS MAC processor. Pet., 35-36 (citing Ex.-1005 [Schain] [0049]).

Even if, *arguendo*, Schain did have a DOCSIS MAC processor and it did process and forward these packets, there is no indication packets are forwarded directly to the purported DNE as claimed. The Petition asserts packets are

transferred between Schain’s cable bridge (its alleged CME) and local bridge (its alleged DNE) via virtual data link 350. *Id.* But Petitioner does not **show** any transfer is done directly: Petitioner merely states as an unsupported conclusion that it **is**. *Id.* It is fundamental that, “[t]o satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements.” *E.g., In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). And Dr. Martin’s “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.” *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, 15 (Aug. 24, 2022) (precedential).

Thus, even if, *arguendo*, a DOCSIS MAC processor did perform Schain’s downstream processing and forwarding, Petitioner has not shown that Schain’s packets are forwarded **directly** to the DNE.

3. Adding Thi Does Not Add Limitation 18[i].

“To the extent the Board finds that Schain does not explicitly disclose processing and forwarding downstream PDU packets without the involvement of the DOCSIS controller,” the Petition alternatively asserts, “this is disclosed by

Thi.” Pet., 36.³ Petitioner, however, fails to show this is true. And even if it had, it fails to show a motivation to combine with a reasonable expectation of success.

Petitioner contends Thi’s voice and data processor is a DOCSIS controller, and that Thi’s “data encryption security” (DES) is a DNE to which PDU packets are forwarded without involvement of that purported “DOCSIS controller.” *Id.* Petitioner bases this argument on its contention that voice and data processor 160 in Thi is a DOCSIS controller, because, Petitioner argues, the ’775 patent describes its DOCSIS controller as “configured to implement VoIP functionality” and Thi “discloses a ‘voice and data processor 160’ which ‘supports the exchange of voice, as well as fax and modem’” and “may be implemented with...voice over packet based networks.” Pet., 37. This argument fails for at least two reasons: Petitioner has not shown (i) that Thi’s voice and data processor is a DOCSIS controller, or (ii) that Thi’s “data encryption security” is a DNE.

a. *Thi’s Voice And Data Processor Is Not A “DOCSIS Controller” And Does Not Control DOCSIS Functions.*

Thi’s “voice and data processor” is not shown to be a “DOCSIS controller.” The Petition identifies no disclosure that Thi’s voice and data processor relates to

³ Petitioner, thus, asserts that Thi “disclose[s]” this, not that Schain-Thi together disclose it or render it obvious. *Id.*

DOCSIS, in name or function. *See* Pet., 37. Its name does not mention DOCSIS. It is not shown to control DOCSIS functions. There is no disclosure of it even participating in DOCSIS operations. The Petition does not argue that the “voice and data processor” meets the standard of being inherently (*i.e.*, “necessarily”) a DOCSIS controller, which it is not. Section III.A. That leaves only conclusory statements, which cannot show obviousness. Section III.B.2.

If any more response were needed, there is “no indication ... that Thi’s voice and data processor ‘controls’ any DOCSIS functions in Thi.” Ex.-2003 [Russ-Decl.] ¶63. As Dr. Russ explains:

[a]s is indicated in the name, the POSITA would have understood that the claimed “DOCSIS controller” would control DOCSIS functions. The ’775 patent supports this understanding. It provides expressly disclosed examples in embodiments of such control, including the processing of management messages to/from the DOCSIS MAC, and MAC address learning. Ex. 1001 [’775] 3:26-38. Tellingly, the Thi reference cites none of these functions.

In contrast to the ’775 patent’s disclosure of DOCSIS control by its claimed “DOCSIS controller,” the Petition points to no disclosures indicating that Thi’s voice and data processor “controls” anything, much less any DOCSIS functions or the DOCSIS MAC. Thi’s disclosures are not shown to point to any “control” aspect of the voice and data processor.

Id., ¶¶64-65. Contrast this to the '775 patent's express descriptions of the claimed "DOCSIS controller" and its control of DOCSIS functions:

The '775 patent discloses that, in an embodiment, the DOCSIS controller "implements the following **DOCSIS** (blocks 200-212) **functions**." Ex. 1001 ['775] 3:26-48. Separately from this disclosure of "DOCSIS functions" (citation omitted), the patent additionally discloses that the "controller 116 also implements all PacketCable functionality...represented by functional blocks 220-228," including "blocks 222 (voice DSP driver), 224...and 226 (voice MAC driver) [which] **interface with external voice DSP 119**." *Id.*

The "PacketCable VoIP functionality" that may be implemented by the DOCSIS controller in this embodiment in the '775 patent is not necessary for the DOCSIS controller to be a DOCSIS controller. PacketCable is an optional part of the DOCSIS standard. This DOCSIS controller would be a DOCSIS controller regardless of whether it performs any voice packet processing. The patent discloses that this additional VoIP functionality is added to improve performance by "minimiz[ing]" "latency and jitter of voice packets." *Id.*, 3:39-41. Thus, VoIP functionality is not a requirement of the DOCSIS controller, but is an addition to the "DOCSIS functions" it would otherwise perform.

Ex.-2003 [Russ-Decl.] ¶¶66-67.

Even if Thi's "voice and data processor" processes "voice" packets, Pet., 37, whether it is a DOCSIS controller as claimed does not turn on voice packet

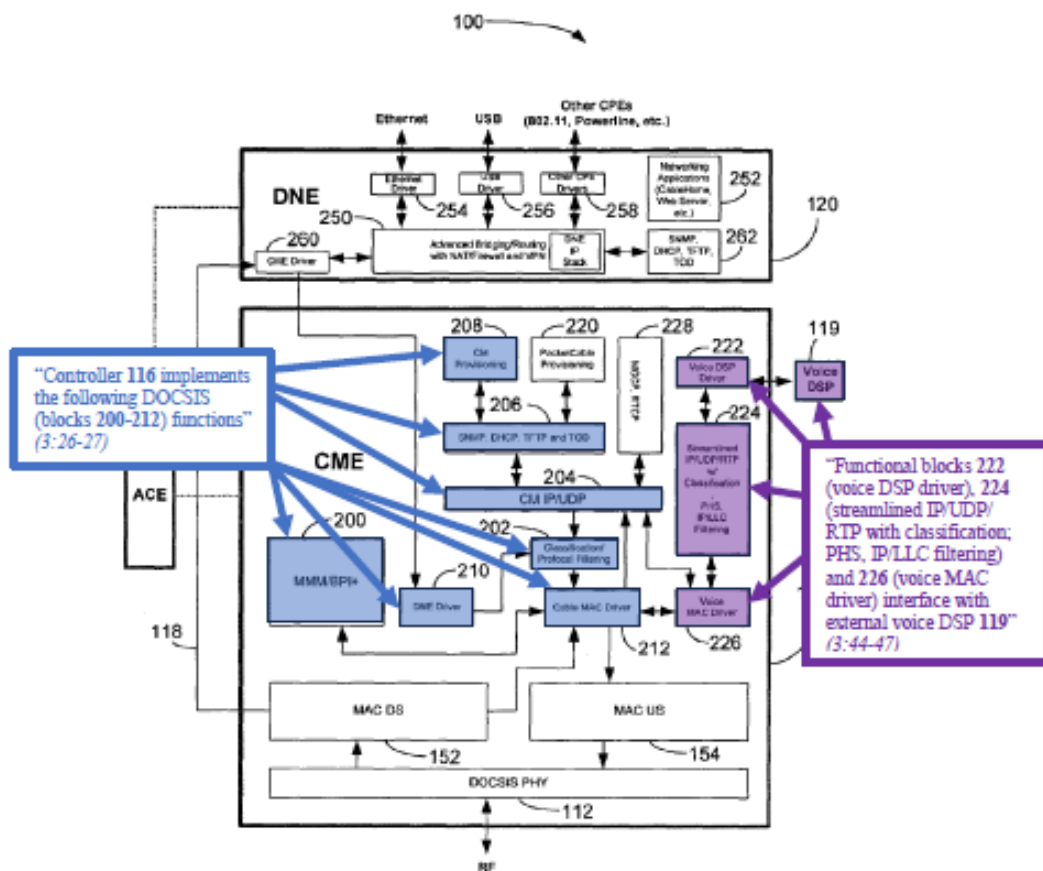
functionality. DOCSIS is a standard relating to cable television networks.

“[S]upport[ing]” VoIP packet based networks (*id.*) or processing or transporting voice over packet-based networks does not intrinsically imply control of DOCSIS functions or a DOCSIS controller. For example, a 3G cell phone implements voice functions over a packet-based cellular network, without having anything to do with the DOCSIS standard, which is for cable television networks. Ex.-2003 [Russ-Decl.] ¶63.

Tellingly, the '775 patent distinguishes between voice processing functions and DOCSIS controller functions. The '775 patent discloses that for advantageous performance VoIP (voice over IP) functionality may be relocated within the Cable Modem Engine. Ex.-1001 ['775] 4:19-24. Specifically, “to minimize the latency and jitter of voice packets,” VoIP functions may be **added to** the DOCSIS controller: “the data path for voice packets is laid entirely within cable modem engine 110 and is optimized to reduce delay and jitter.” *Id.*, 3:39-41, 4:55-57. Thus, tight integration reduces processing and travel time for these real-time voice packets. But adding VoIP processing to a CME controller does not affect whether or not it is a **DOCSIS** controller. *Compare, e.g., id.*, cl. 1 (reciting DOCSIS controller as CME component) *with* cl. 3 (further reciting VoIP functionality embedded in CME) *and* cl. 6 (reciting “wherein all VoIP functionality is

implemented in the DOCSIS controller”). Otherwise, every VoIP processor would have to be a DOCSIS controller. Ex.-2003 [Russ-Decl.] ¶68.

The Patent's FIG. 2 further illustrates this distinction. There, exemplary DOCSIS control functions are blocks 200-212. *Id.*, 3:26-27 ("Controller 116 implements the following DOCSIS (blocks **200-212**) functions"). Meanwhile, the VoIP functions are blocks 222, 224, 226 and external DSP 119. *Id.*, 3:44-47 ("Functional blocks 222 (voice DSP driver), 224 (streamlined IP/UDP/RTP with classification; PHS, IP/LLC 45 filtering) and 226 (voice MAC driver) interface with external voice DSP 119").



Ex.-1001 [’775] Fig. 2 (annotated). Nothing shows that these separately shown DOCSIS and voice functional blocks overlap.

Thus, Petitioner has not shown that Thi’s “voice and data processor” is a DOCSIS controller, and that a DOCSIS controller is bypassed by the packets forwarded to the DNE.

b. *Thi’s DES Is Not Shown To Be A DNE.*

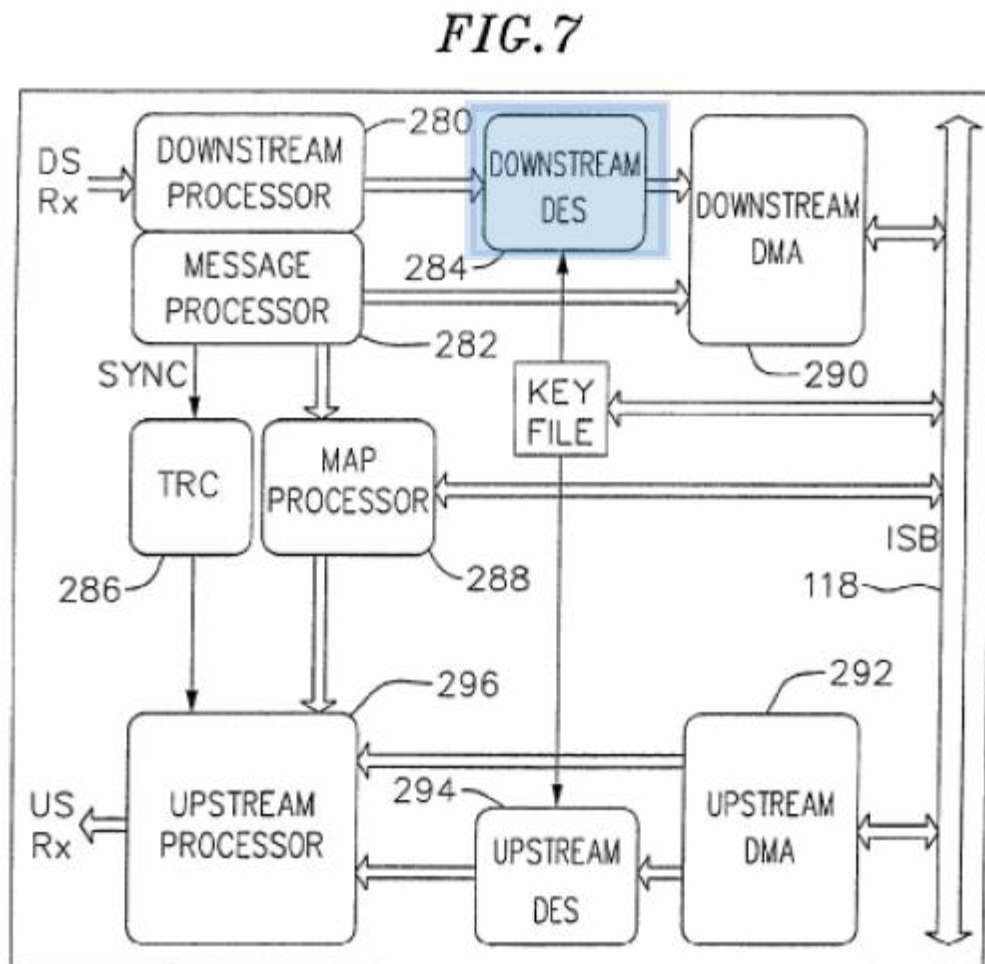
Petitioner also fails to demonstrate packets are sent “directly” to the DNE. The element it points to as the DNE, Thi’s data encryption security or “DES” 284, is not shown to be the claimed DNE.

Petitioner contends only that a “POSITA would understand the DES 284 of Thi ***is equivalent to the claimed data networking engine***, as the function of the data networking engine as well as the DES is to perform security processing of the forwarded packet.” Pet., 39. This argument fails because performing security processing and/or encryption on packets is not enough to make something a DNE. The ’775 patent describes preferred embodiments of the “[d]ata networking engine” as “responsible for all data networking processing[.]” See Ex.-1001 [’775] 3:49-51; see also *id.*, 3:51-4:3. While a DNE need not perform every exemplary function of DNEs disclosed in the patent, Petitioner does not explain why or how performing security processing on the forwarded packet could suffice to render Thi’s DES a DNE or its equivalent. Ex.-2003 [Russ-Decl.] ¶74.

Even if Thi's DES were a DNE, it would still be far afield of the claims.

The Petition refers to “downstream DES 284” as the alleged DNE. Pet., 39. But remarkably, the Petition ignores that Thi's downstream DES 284 is *part of Thi's DOCSIS MAC*, which the claims require in the CME, not the DNE.

Thi's “block diagram of a *DOCSIS media access controller (MAC)*” (Ex.-1006 [Thi] [0020]), for example, includes downstream DES 284:



Id., Fig. 7 (annotated). The claims, however, require the “DOCSIS MAC

processor” to be part of the CME, which must be on a separate circuit from the DNE and functionally partitioned from the DNE.

Thus, even if the DES were a DNE, Thi’s disclosures indicate it is in the CME, not separated from the CME as the claims require.

c. *No Motivation Or Expectation Of Success Is Shown.*

Even, if, *arguendo*, Thi’s voice and data processor were a DOCSIS controller, **and** its DES were a DNE, **and** its alleged DNE were not a part of a DOCSIS MAC processor, Petitioner still fails to show that the POSITA would be motivated to make its combination with a reasonable likelihood of success.

First, the Petition ignores that Schain does not disclose a voice and data processor (Thi’s purported “DOCSIS controller”), and indeed does not discuss VoIP or the ability to process voice packets at all. *See generally* Ex.-1005 [Schain]. There is no apparent reason to apply Thi’s voice and data processor teachings to Schain. Ex.-2003 [Russ-Decl.] ¶77. Notably, during prosecution the Examiner reached much the same conclusion, determining that “Schain does not specifically teach...VoIP functionality in accordance with the PacketCable specification,” and relying instead on another reference to allegedly read on this limitation. Ex.-1002 [Pros-Hist.] 71. Nothing shows that the POSITA would have looked to Thi’s voice and data processor to modify Schain, which is not shown to have any disclosure of processing voice packets. Ex.-2003 [Russ-Decl.] ¶77.

Furthermore, as noted above, Thi's alleged DNE (Thi's DES), is a part of Thi's DOCSIS MAC, which is part of the alleged CME. Ex.-1006 [Thi] Fig. 7. In contrast, the claims require that the DNE be on a separate circuit from, and functionally partitioned from, the CME. Ex.-1001 ['775] cl. 18[h]. Petitioner gives no explanation of why the POSITA would be motivated, or expect success in an attempt, to modify the combination by carving out a portion of Thi's CME, proclaiming it a DNE, placing it in a separate circuit, and then routing packets directly to that DNE while bypassing Thi's voice and data processor, which, again, Schain has no shown use for. It would be improper to add these missing parts of the claim under a hindsight "obviousness" theory. Section IV.C.

Petitioner's combination, thus, does not disclose this limitation.

C. Schain Lacks The "Data Networking Engine Implemented In A First Circuit" And The "Cable Modem Engine Implemented In A Second Circuit" (Limitations 18[a], 18[c], All Claims).

In Petitioner's first ground, Petitioner relies exclusively on Schain for limitations 18[a] and [c]. These limitations require "a data networking engine implemented in a *first circuit*" (18[a]) and "a cable modem engine implemented in a *second circuit*" (18[c]).

Petitioner relies on an argument that Schain discloses each of these limitations, relying specifically upon Schain's claim 1. But Petitioner fails to show that these limitations are disclosed. Schain's claim 1 describes both of these

alleged engines as being on “a circuit,” rather than one being in a first circuit and one being in a separate second circuit. Petitioner does not argue that the “a circuit” of Schain’s claim 1 contains multiple circuits. Nor does Petitioner argue that it would have been obvious to modify Schain to add these limitations.

Specifically, Petitioner argues that Schain’s “local bridge 345,” its alleged DNE, is “implemented in a circuit,” relying for this assertion on Schain’s claim 1:

The local bridge is implemented in a circuit: “A circuit comprising ... a local bridge.” Ex. 1005, claim 1; Ex. 1003, ¶61.

Pet., 26. At the same time, in the same words, Petitioner argues that Schain’s “cable bridge 315,” its alleged CME, is likewise “implemented in a circuit,” relying again upon Schain’s claim 1:

Per claim 1 of Schain, the cable bridge (also referred to as a broadband bridge) is implemented in a circuit: “a broadband bridge ... containing circuitry.” Ex. 1005, claim 1; Ex. 1003, ¶72.

Pet., 29. Petitioner’s citations to Dr. Martin’s declaration only offer the same conclusions, without citing additional analysis or evidence. Thus, to allegedly show a DNE “implemented in a first circuit” **and** a CME “implemented in a second circuit,” Petitioner and its expert rely solely, without any discernible explanation, on Schain claim 1’s recital of implementing its elements in “a circuit.” But Schain’s claim 1 simply says it claims “a circuit” comprising every last one of

its elements, including the alleged DNE and CME. Ex.-1005, claim 1. Petitioner never argues that Schain teaches that the alleged DNE and CME in its claim 1 may be implemented on separate circuits within claim 1's "circuit."

As reproduced below, Schain's claim 1 recites "[a] circuit comprising" both "a broadband bridge" (*i.e.*, the alleged CME) and "a local bridge" (*i.e.*, the alleged DNE)":

What is claimed is:

1. **A circuit comprising:**

a broadband modem coupled to a broadband medium, the broadband modem comprising:

a broadband bridge coupled to a broadband connection, the broadband bridge containing circuitry to filter packets;

a first Internet protocol (IP) layer coupled to the broadband bridge, the first IP layer to process data packets according to an Internet protocol;

a residential gateway comprising:

a local bridge coupled to a network connection, the local bridge containing circuitry to filter packets;

a second IP layer coupled to the local bridge, the second IP layer to process data packets according to the Internet protocol; and

the circuit further comprising a virtual data link coupled at a first end to the broadband bridge and at a second end to the local bridge, the virtual data link to allow packets from one bridge to cross into the other.

Ex.-1005 [Schain] cl. 1 (annotated).

Petitioner does not assert that Schain discloses that its broadband bridge and

local bridge of its claim 1 may be implemented on separate “first” and “second” sub-circuits within the “circuit” disclosed in Schain’s claim 1. Indeed, Petitioner does not expressly assert that Schain claim 1 discloses more than one “circuit,” but merely that each of Schain’s two bridges is “implemented in *a* circuit”—seemingly consistent with them sharing a single circuit. Pet., 26, 29. In contrast, ’775 claim 18 recites a DNE in “a first circuit” and separately a CME in “a second circuit, which is commonplace language for claiming repeated, separate elements. See, e.g., *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2005) (“The use of the terms ‘first’ and ‘second’ is a common patent-law convention to distinguish between repeated instances of an element or limitation.”); *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005); *Regents of Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 935–39 (Fed. Cir. 2013) (“first” and “second” disks). It bears repeating that claim 18 is not satisfied by an alleged DNE and CME implemented on the same circuit.

In sum, Petitioner fails to show Schain discloses or renders obvious a DNE “implemented on a first circuit” and CME “implemented on a second circuit.”

D. Petitioner’s Estoppel Theory As To Schain Is Meritless (All Claims, Ground 1).

The Petition vaguely asserts that “estoppel should apply as to the features noted by the examiner as disclosed in Schain” for all elements of the independent

claims, except limitation 18[i], because Schain was the subject of a rejection overcome during prosecution. Pet., 24; see Ex.-1002 [Pros.-Hist.] 47, 56, 66-73. Petitioner does not specify the type of “estoppel” meant.⁴ Whatever type is meant, Petitioner’s theory relies on an assertion that is demonstrably false: that in prosecution, Patent Owner supposedly “made no argument” that Schain did not teach the independent claims. No such “estoppel” applies.

First, Petitioner misapprehends the prosecution. Its premise that “Patent Owner made no argument that Schain did not teach the features of the independent claims, instead amending to overcome Schain without argument,” Pet., 24, is incorrect. After the Examiner rejected claim 18 based on Schain, Patent Owner expressly “traverse[d]” and “respectfully requested” “[r]econsideration” of the rejection. Ex.-1002 [Pros.-Hist.] 56. In the same filing, Patent Owner presented claim amendments, expressly “without acquiescence, in the interests, e.g., of advancing the prosecution of this case, avoiding additional costs, etc.” *Id.* Patent Owner expressly based this amendment on the Examiner having already conceded

⁴ While there is such a thing as “prosecution history estoppel,” it applies to the doctrine of equivalents, which is not involved in this case. See *Pharmacia & Upjohn Co. v. Mylan Pharms., Inc.*, 170 F.3d 1373, 1376 (Fed. Cir. 1999).

that the subject matter of these claims was “allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.” *Id.*, 72. Thus, the Petition’s assertion that Applicant made “no argument” is false: Applicant disagreed with the Examiner’s findings, traversed the rejections, sought reconsideration, and offered amendments “without acquiescence” on these points. *Id.*, 56.

Petitioner cites no controlling authority for its position. The two cases it cites are not binding and did not estop a patent owner, based on prosecution, from addressing whether a reference meets a claim. Pet., 24. First, *Google LLC v. Parus Holdings, Inc.*, IPR2022-00279, Paper 16 (Sept. 18, 2023), involved “collateral estoppel” from a prior IPR. *Id.*, 18. “Collateral estoppel” means that a **prior litigation** reached a final judgment that resolved an issue, estopping the party from relitigating that issue in a subsequent litigation—requiring a “first action” that was “actually litigated” and that the issue be “essential to a final judgment in the first action.” *Id.* Here, the prosecution is not shown to be a “first action,” nor one that “actually litigated” this issue or resulted in a “final judgment” on it, nor was the Examiner’s rejection “essential” to a judgment on this issue—the rejection was overcome by being obviated by amendment. Meanwhile, *Electa Ltd. v. Zap Surgical Sys., Inc.*, [81 F.4th 1368 (Fed. Cir. 2023)] [*sic* (miscited by Petitioner)], does not mention “estoppel,” and looked to prosecution history only to address

whether a reference was “relevant art” and whether there was a “motivation to combine.” *See id.*, 1374-75. Neither case is relevant here.

No facts or law support Petitioner’s position that “estoppel” should apply.

For all the reasons above, Ground 1 fails to satisfy 35 U.S.C. §314(a).

IV. PERLMAN, CROCKER, AND FOX DO NOT DISCLOSE OR RENDER OBVIOUS THE CLAIMS (ALL CLAIMS, GROUND 2).

Petitioner’s second ground relies upon Perlman, Crocker, and Fox. Like the first ground, it suffers from many fatal deficiencies. First, Petitioner fails to show that Perlman/Crocker/Fox discloses or renders obvious a DNE and CME implemented on separate circuits with at least one processor apiece (limitations 18[a], [c]-[d]). Section IV.A. The combination also fails to disclose or render obvious CME software independently upgradeable from the DNE’s software (18[g]). Section IV.B. It also fails to disclose or render obvious a DOCSIS MAC processor configured to process and forward packets directly to the DNE without involvement of the DOCSIS controller (18[i]); a data bus connecting the CME to the DNE (18[j]); or a DNE that performs “home networking functions include interfacing with customer provided equipment” (18[a]-[b]). Sections IV.C-E.

A. Perlman And Crocker Do Not Disclose Or Render Obvious “A First Circuit That Includes At Least One Processor” And “A Second Circuit That Includes At Least One Processor,” “Separate From The First Circuit” (Limitations 18[a], [c]-[d], All Claims).

Limitation 18[a] requires “a data networking engine implemented in a *first*

circuit that includes at least one processor.” Limitations 18[c]-[d] require “a cable modem engine implemented in a *second circuit that includes at least one processor,*” “the second circuit being *separate from* the first circuit.” Petitioner asserts that Perlman discloses these limitations or alternatively, that Crocker discloses them and would be combined with Perlman. However, Perlman only discloses a processor shared by the purported DNE and CME, and concededly does not teach that its alleged DNE and CME are on separate circuits. Section IV.A.1. Meanwhile, Crocker fails to disclose a DNE that performs “home networking functions including interfacing with customer provided equipment” and thus fails to meet limitation 18[a]. Section IV.A.2; *see also* Section IV.E.

1. Perlman’s “Logic[s]” Do Not Meet These Limitations.

The Petition asserts that Perlman discloses these limitations, as follows:

- “MPEG-2 logic” is purportedly the DNE, and **CPU 225** “which is configured to select the MPEG-2 logic when appropriate” is purportedly the “at least one processor” of the DNE’s circuit. Pet., 46 (citing Ex.-1007 [Perlman] [0028]).
- Petitioner asserts that Perlman’s “DOCSIS logic” is the CME and that Perlman “discloses ‘software executed *by the CPU 225*’ configured to select the DOCSIS logic when appropriate,” making the “CPU...a processor” of the CME’s circuit. Pet., 53.

Perlman does not satisfy limitations 18[a], [c], and [d]. These limitations recite separate processors for the DNE and CME, reciting a DNE “implemented in a first circuit that includes at least one processor” and a CME “implemented in a second circuit that includes at least one processor” and further that the first and second circuits are “separate” from one another. Because the claims require two separate circuits each including “at least one processor,” the two processors cannot be one and the same. However, the Petition relies on CPU 225 as the “at least one processor” **both** for the DNE **and** for the CME.

“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention.” *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (cleaned up); *see, e.g., HTC Corp. v. Cellular Communs Equip., LLC*, 701 Fed. App’x. 978, 982 (Fed. Cir. 2017) (“separate naming of two structures in the claim strongly implies that the named entities are not one and the same structure”). Consequently, both this Board and its reviewing court agree that “[t]he same disclosure of [a prior art reference] cannot be used to meet separate elements of the same claim.” *Apple Inc. v. Evolutionary Intelligence, LLC*, IPR2014-00085, Paper 9, 18 (Apr. 25, 2014); *see Cisco Sys., Inc. v. Egenera, Inc.*, IPR2017-01341, Paper 10, 15 (Nov. 13, 2017) (“reliance on the same component for multiple claim elements is improper.”). This rule is routinely applied to reject attempts to rely on

one structure in the prior art to satisfy multiple claim elements. *See, e.g., id.*; *Franklin Elec. Co., Inc. v. Liberty Pumps, Inc.*, IPR2017-00112, Paper 14, 9-10 (Apr. 27, 2017) (“‘hanging feature’ and ‘shelf’ refer to two distinct and separately identifiable structures and are not construed properly as reading on the same, single structure”). Petitioner points to nothing permitting the same prior art processor to satisfy two separately recited processors in two different, “separate” circuits.

Nor does the Petition show that Perlman discloses a DNE implemented on a first circuit and a CME implemented on a separate second circuit. Petitioner asserts this claim language is met because Perlman allegedly “shows and describes MPEG-2 logic and DOCSIS logic as two separate components with different functionality,” and “a POSITA would understand that the MPEG-2 logic and DOCSIS logic [] **could be** implemented on separate circuits.” Pet., 56. Petitioner refers to its annotated version of Perlman’s Figure 2a for this attempted distinction:

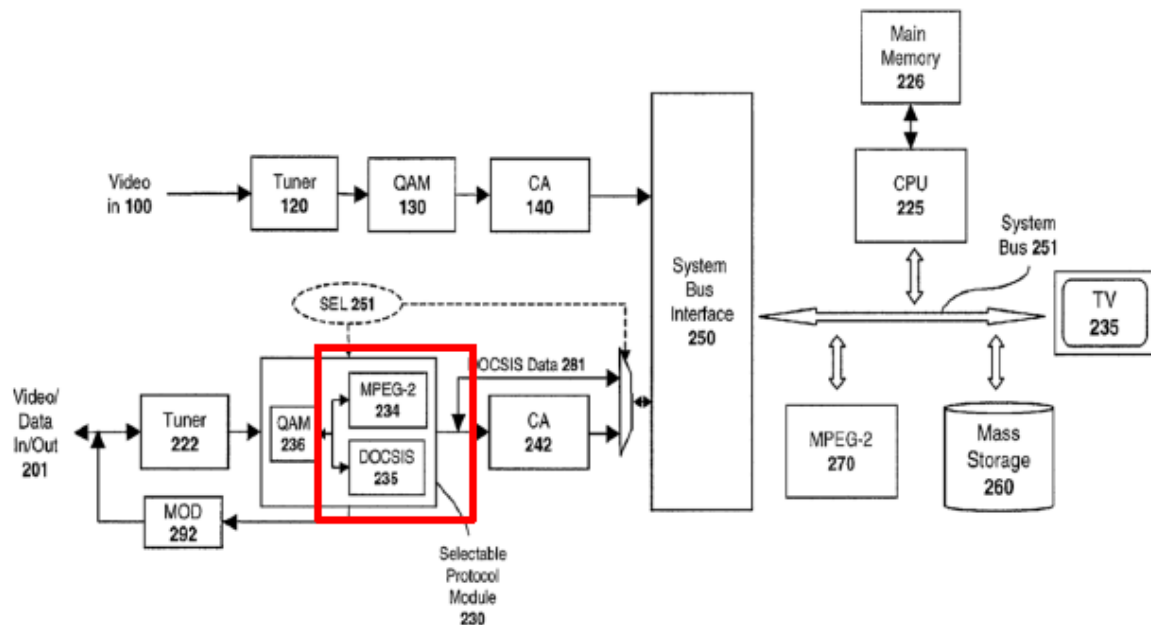


FIG. 2a

Pet., 56.

To begin with, Petitioner’s assertion that Perlman’s MPEG-2 logic and DOCSIS logic “could be implemented” on separate circuits is an admission that Perlman does not disclose them on separate circuits. Nothing in Perlman’s disclosure states or is argued to state such a thing. Even if, *arguendo*, the POSITA “could” implement Perlman’s MPEG-2 logic and DOCSIS logic on different, separate circuits as the claimed DNE and CME, that would not show the limitation is obvious. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art

to arrive at the claimed invention.”) (emphasis in original) (citing *InTouch Techs., Inc. v. VGO Communs., Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014)). The Petition cites no evidence a POSITA **would** be motivated to implement the MPEG-2 logic and the DOCSIS logic on separate circuits. Conclusory assertions cannot support obviousness. Section III.B.2, *supra*.

2. Crocker’s “Line Cards” Do Not Add These Limitations.

Alternatively, the Petition asserts it was obvious to modify Perlman’s MPEG logic and DOCSIS logic with Crocker’s line cards 735 and 731, respectively, to achieve a “first circuit” “separate from” a “second circuit.” Pet., 47-48, 53-54, 56-58. Petitioner asserts that Crocker’s line cards 735 and 731 meet the “first circuit” and “second circuit” respectively because “[a] line card was known in the art to be a circuit,” *id.*, 47-48, 53-54, and “[a] POSITA would be motivated to modify the” MPEG logic and DOCSIS logic of Perlman with the line cards 735 and 731 of Crocker, respectively, and these circuits would be “separate from” one another, because they have “similar functionality” and it “would increase the flexibility of the system described in Perlman.” *Id.*, 48, 55, 58.

As an initial matter, Petitioner offers nothing but conclusory statements for this argument, simply asserting these “logics” could be modif[ied]” in view of the “line cards” without explaining how. Pet., 48, 55, 58. Significantly, it is not even clear whether Perlman’s MPEG-2 logic and DOCSIS logic are software or

hardware. *Cf., e.g.*, Ex.-1007 [Perlman] [0028] (stating, with respect to another “logic,” that the “logic...may be embodied in software executed by the CPU 225” or “may be embodied in any combination of hardware..., software and/or firmware”). (This passage addresses a different, “selection logic”; Perlman does supplies even less discussion than this of the possible form of its MPEG-2 logic and DOCSIS logic.) Petitioner also fails to explain how Perlman’s MPEG logic (purported DNE) or DOCSIS logic (purported CME) have “similar functionalit[ies]” to Crocker’s line cards 735 and 731. Pet., 48, 55, 58. Petitioner asserts similar functionalities exist between Perlman and Crocker, but does not identify any of them in particular. *Id.* (Petitioner’s expert offers no further explanation. Ex.-1003 [Martin-Decl.] ¶¶137, 155, 166.) Without any information, one cannot “weigh the benefits and drawbacks of the modification against each other, to determine whether there would be a motivation to combine,” as would be required to find obviousness. *Arctic Cat Inc. v. Polaris Indus.*, 795 Fed. App’x. 827, 833 (Fed. Cir. 2019) (citing *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000)). Petitioner also fails to show that Perlman and Crocker are “similar” such that the POSITA would be motivated to make the combination, as alleged. Pet., 48, 55, 58. These are among the reasons why “mere conclusory statements” cannot show obviousness. *Magnum Oil*, 829 F.3d at 1380.

Instead, the POSITA would understand that Perlman and Crocker’s systems

do not have “similar functionalit[ies].” Petitioner asserts Perlman is a cable modem (CM) system (Pet., 15), but Crocker is explicitly a cable modem termination system (CMTS) (Pet., 16-17; Ex.-1008 [Crocker] 1:50-52). A CMTS and CM exist at opposite sides of a cable network, as a CMTS is the system used by a cable provider while a cable modem system is used by the subscriber in their home. Ex.-2003 [Russ-Decl.] ¶¶99, 160-162. A CMTS handles vastly different functions than a CM, since it is designed to interface with, control, and manage dozens or hundreds of CMs, not to *be* a CM, and it is designed to interface with the internet and other sources of cable television content, not with a data network within a customer’s home or premises. *Id.*, ¶¶99-101, 160-162. Given this important distinction, it is not shown that the POSITA would’ve been motivated to combine Perlman and Crocker. No such motivation exists where the combination would render one of the references “inoperable for its ***intended purpose***.” *Plas-Pak Indus. v. Sulzer Mixpac AG*, 600 Fed. App’x. 755, 760 (Fed. Cir. 2015) (“modifying Jacobsen to accommodate the spray nozzle of Hunter would render Jacobsen ‘inoperable for its intended purpose,’ and a person of ordinary skill would thus not have been motivated to pursue the combination.”) (citing *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984), *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374 (Fed. Cir. 2007)). Perlman’s intended purpose is to have a “multimedia system capable of selection between different network protocols for

transmitting and receiving data and multimedia content” which is performed in “a more flexible, efficient and intelligent manner.” Ex.-1007 [Perlman] [0002], [0011]. The addition of Crocker’s line cards to Perlman is the opposite of a “flexible, efficient and intelligent manner,” as Perlman does not use line cards or need to service cable modems. Indeed, adding a separable line card would seem to dramatically increase costs, including connectors and separate circuit boards needed to implement it. Ex.-2003 [Russ-Decl.] ¶¶100-101.

Similarly, the POSITA is not motivated to make a combination that would change the basic principle of operation of one of the references. *See In re Ratti*, 270 F.2d 810, 813 (CCPA 1959) (proffered combination is not proper where it would change the basic principles of operation of one of the references); *Plas-Pak*, 600 F. App’x. at 759 (“a change in a reference’s ‘principle of operation’ is unlikely to motivate a person of ordinary skill to pursue a combination with that reference”). Again, Perlman’s basic principle of operation is to manage multimedia communications and network protocols. Adding hardware in the form of Crocker’s line cards would unnecessarily complicate its system, as Perlman is not designed to manage multiple CM systems or implement line cards, but rather to select between multimedia channels and receive and transmit multimedia content.

Petitioner’s remaining reason for modifying Perlman in view of Crocker’s line cards—that they would “increase the flexibility of the system described in

Perlman”—also lacks explanation or support. Petitioner does not say **why** this would increase the flexibility of Perlman’s system, and thus why a POSITA would be motivated to modify Perlman. Petitioner’s citations to Crocker at 3:43-45 say nothing about increased flexibility, nor does Petitioner explain how such flexibility would result. The cited part of Crocker states that it is “desirable to improve upon the interoperability of hardware and/or software components in access networks in order to accommodate new and emerging network applications and technologies.” Ex.-1008 [Crocker] 3:43-45. This does not explain how adding Crocker’s line cards to Perlman’s system could result in increased flexibility for these aspects of **Perlman**. Rather, as discussed above, adding a separable line card would dramatically increase costs for what appears to be no tangible benefit. Ex.-2003 [Russ-Decl.] ¶¶100-101.

Petitioner does not explain its citations to Mr. Martin’s declaration for these assertions. Ex.-1003 [Martin-Decl.] ¶¶137-138, 155-157, 166. Petitioner may not incorporate-by-reference unexplained expert testimony. 37 C.F.R. § 42.6(a)(3). The Board should decline to consider any unexplained content in these citations. *3M Co. v. Evergreen Adhesives, Inc.*, 860 Fed. App’x. 724, 725-728 (Fed. Cir. 2021) (Board properly declined to consider improperly incorporated testimony); *see also Promptu Sys. Corp. v. Comcast Cable Comm’ns, LLC*, 92 F.4th 1384, 1386 (Fed. Cir. 2024) (*per curiam*) (holding improper attempts to exceed word

count through incorporation by reference are “not only an inefficient use of this Court’s resources, but unfair”).

Thus, Petitioner has not shown that the POSITA was motivated to modify Perlman in view of Crocker or how this would be achieved without negatively impacting Perlman’s functionality, yet still meet limitations 18[a] and 18[c]-[d].

B. Perlman, Crocker, And Fox Do Not Render Obvious A CME “Configured To Enable Upgrades To Its Software In A Manner That Is Independent Of Upgrades To The Software Of The [DNE]” (Limitation 18[g], All Claims).

Limitation 18[g] requires “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.” Ground 2 relies on Perlman, Crocker, and Fox for 18[g]. But Perlman and Crocker do not even disclose upgrading software, much less upgrades to its purported CME’s software independent of upgrades to the software of its purported DNE. Section IV.B.1. Petitioner alternatively relies upon Fox, but, fails to demonstrate that Fox is even analogous art to the ’775 patent. Section IV.B.2.

1. Petitioner Fails To Show That Perlman Or Crocker Disclose Upgrading Software, Much Less Upgrading CME Software Independently Of DNE Software.

Petitioner first argues Perlman and Crocker each explicitly disclose a “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.” Pet., 63-64. But neither Perlman nor Crocker even discloses upgrading software, much less upgrading the CME’s software independent of the DNE’s, as claimed.

a. *Perlman*

Petitioner asserts that Perlman discloses the claimed independent software upgradability by allegedly disclosing ““selection logic 250 [which] switches between MPEG-2 logic 232 for receiving multimedia content and DOCSIS logic 233 for processing packetized DOCSIS data/content,”” and ““two separate communication channels... which process content and data under the DOCSIS standard when selected by selection logic 250-251.”” Pet., 63. Petitioner contends that “[s]ince the MPEG-2 logic 232 and DOCSIS logic 233 use separate communication channels and perform separate functions, the MPEG-2 logic 232 and DOCSIS logic 233 can be independently upgraded.” *Id.*, 63-64.

That does not follow. Petitioner identifies nothing in Perlman disclosing or suggesting that the software for MPEG-2 logic or DOCSIS logic is upgradeable, much less configured for independent upgradeability as claimed. Petitioner asserts that, when communication channels and functions are separate, the two “**can** be independently upgraded.” But Perlman does not mention upgrading software, much less configuring its system to allow for it. Nor does the presence of alternate communications paths prove independent upgradability. Ex.-2003 [Russ-Decl.]

¶109. Rather, the POSITA would understand that, generally, an MPEG-2 decoder is not upgradable, as it performs a fixed function. Ex.-2003 [Russ-Decl.] ¶110.

Petitioner's assertion that Perlman's DOCSIS logic "can be independently upgraded" from the MPEG-2 logic (Pet., 63-64) is conclusory. The Petition does not explain how this could or would be accomplished, and offers no technical support for its assertion (*id.*) that this purported separation of functions and communication channels would necessarily disclose independent upgradeability. Conclusory statements cannot show obviousness. *See* Section III.B.3.

To the extent Petitioner may be suggesting such independent upgradeability is inherent to Perlman, there is no showing that such upgradeability is necessarily present, especially since Perlman does not even mention it. Section III.A (citing authorities). Perlman does not disclose **any** upgradeability of software of its purported DNE (its MPEG-2 logic) or CME (its DOCSIS logic), much less **independent** upgradeability. Petitioner argues otherwise based solely on its assertion that the MPEG-2 and DOCSIS logics "use separate communication channels and perform separate functions." Again, this does not even inherently show upgradeability. Perlman simply does not disclose this limitation.

b. *Crocker*

In the alternative, Petitioner asserts that Crocker's "line cards 731 and 735 are physically separate," and since they "are installed on physical [*sic*] separate

circuitry, updates to the software of one can be effected independently of updates to the other at least by ***physically replacing*** either circuit.” Pet., 64. To be clear, no disclosure in Crocker shows that its line cards can even be physically replaced. Petitioner offers conclusory assertions that Crocker ***can*** physically replace circuits simply because its line cards are installed on physically separate circuitry, *id.*, but points to no support in Crocker or elsewhere for either conclusion. Petitioner’s conclusory and incomplete analysis, parroted by its expert, is legally insufficient for obviousness. Section III.B.2 (citing authorities); *see* 37 C.F.R. § 42.65.

Even if, *arguendo*, the line cards could be replaced, that is far afield from what the claims require. Upgrading software is different from replacing hardware. The Petition and Dr. Martin conflate the ***possibility*** of ***replacing hardware*** in Crocker with the independent ***upgrading of software*** required by the claims. Pet., 64; Ex.-1003 [Martin-Decl.] ¶188. No reason or explanation is offered that these two different things are not two different things. Crocker, like Perlman, provides no disclosures concerning upgrading software, much less upgrading the alleged CME’s software independent of upgrading the alleged DNE’s software. Ex.-2003 [Russ-Decl.] ¶¶111-113.

Even assuming, *arguendo*, reasons to combine, Petitioner ignores Crocker’s existing capability to replace hardware, which supports non-obviousness. The POSITA armed with Crocker’s physically replaceable hardware modules would

have a ready alternative to performing any software upgrades: why bother upgrading software when the entire functional module is expected to be replaceable? *See* Ex.-2003 [Russ-Decl.] ¶117. If anything, therefore, Perlman/Crocker teaches away from the invention. It is not shown that the POSITA would obviously add independent software upgradeability as claimed.

2. Petitioner Fails To Show Fox Is Analogous Art (All Claims).

Petitioner alternatively argues that the addition of the Fox reference renders limitation 18[g] obvious. Petitioner, however, fails to prove that Fox is analogous art, and in fact confirms that Fox is **not** analogous art.

Art must be “analogous” to be considered for purposes of an obviousness analysis. *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011) (“A reference qualifies as prior art for an obviousness determination under § 103 **only when it is analogous** to the claimed invention.”). Petitioner has the “burden” of showing analogousness. *Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1377 (Fed. Cir. 2023). Analogous references must be either (1) “from the **same field of endeavor**” as the challenged patent or (2) “reasonably pertinent to the **particular problem** [that] the inventor[s]” of the patent at issue were trying to solve. *In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992).

Petitioner—quite rightly—does **not** contend that Fox is reasonably pertinent to the problem the inventors of the ’775 patent were trying to solve. Petitioner

only contends that:

Fox is from the same field of endeavor as the '775 Patent, **as both relate to techniques for efficient networking.** Ex. 1003, ¶33. Thus, Fox is analogous art to the '775 Patent.

Pet., 18. Thus, Petitioner contends that Fox is analogous because both Fox and the patent allegedly share the field “techniques for efficient networking.”

As seen above, Petitioner does not cite any evidence for its assertion that the '775 patent's field is “techniques for efficient networking.” And that assertion is not credible. When Petitioner (and its expert) identify the '775 patent's field in relation to the four other references deployed in the Petition, in each instance—with the glaring exception of Fox—Ppetitioner and its expert contend that the '775 patent's field relates to a **different** field: “**cable modem systems**” (or, in one instance, “systems for networking cable modem functionality”):

- “Schain is from the same field of endeavor as the '775 Patent, as **both relate to cable modem systems.**” Pet., 12; Ex.-1003 [Martin-Decl.] ¶22.
- “Thi is from the same field of endeavor as the '775 Patent, as **both relate to cable modem systems.**” Pet., 14; Ex.-1003 [Martin-Decl.] ¶26.
- “Perlman is from the same field of endeavor as the '775 Patent, **as**

both relate to cable modem systems.” Pet., 15; Ex.-1003 [Martin-Decl.] ¶29.

- “Crocker is from the same field of endeavor as the ’775 Patent, *as both relate to systems for networking including cable modem functionality.*” Pet., 16; *but see* Ex.-1003 [Martin-Decl.] ¶30 (“Crocker is in the same field as the ’775 Patent, *as both relate to cable modem systems.*”).⁵

Thus, for all references except Fox, the Petition asserts the “field,” at least to some extent, relates to “cable modem systems,” or “functionality” in the case of Crocker. (Petitioner’s expert, who Petitioner cites in support of its position, also identifies the ’775’s “field” as “*cable modem systems.*” Ex.-1003 [Martin-Decl.] ¶30.)

Not so for Fox. After identifying the ’775 patent’s field as “cable modem systems” or, at the very least, as involving “cable modem functionality,” Pet., 12-16, Petitioner provides no explanation for why the ’775 patent’s field would somehow be a different field for purposes of analogousness to Fox, *id.*, 18, much less why that different field would be the more amorphous and generic “techniques

⁵ Patent Owner does not concede that Petitioner’s other references are analogous art.

for efficient networking”—a term which does not even mention “cable modem systems” or “cable modem functionality.”

Nothing in the ’775 patent’s disclosure supports this inconsistency. The test for analogous art “set[s] the field of the invention by consulting the structure and function of the claimed invention as perceived by one of ordinary skill in the art.” *In re Bigio*, 381 F.3d 1320, 1326 (Fed. Cir. 2004). The ’775 patent’s claimed invention—in seeming accord with Petitioner’s identification of the patent’s field in all contexts besides Fox, Pet., 12-16—is about “cable modems.” The patent is titled “Architecture for a flexible and high-performance gateway **cable modem**.” Its Abstract describes a “**cable modem system** and architecture.” Its “**Field** of the Invention” says “The present invention relates to **cable modems** and, in particular, **relates to a cable modem system** having a functionally partitioned and flexible architecture.” Ex.-1001 [’775] 1:7-9. Its Background section focuses upon a “future gateway **cable modem**” (*id.*, 1:13) and “designing...a gateway **cable modem**” (*id.*, 1:16-17), and indicates that “[t]he present invention provides a gateway **cable modem** architecture that meets” certain “objectives” (*id.*, 1:56-57). Its “Summary of the Invention” says “[t]he present invention provides a gateway **cable modem**” and that “[o]ne embodiment of the invention is a **cable modem system**” *Id.*, 1:61-66. Its drawings relate to “a block diagram of a gateway **cable modem**” and a “functional block diagram implementing the **cable modem**

architecture of Fig. 1.” *Id.*, 2:42-45. And its claims recite a “**cable modem system**” (*id.*, cls. 1, 18) or “method of **cable modem operation**” (*id.*, cl. 14). The entirety of the ’775 patent confirms that its field of endeavor is “cable modem systems,” in precisely the portions of the patent, as listed above, that the Federal Circuit has looked to discern the field of endeavor for analogous art purposes. *See, e.g., In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979) (determining field of endeavor based on “Background of Invention”); *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1237-38 (Fed. Cir. 2010) (similar); *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1381 n. 8 (Fed. Cir. 2019) (“[T]he specification of each reference includes a ‘Field of the Invention’ section that distinctly describes each applicable field of endeavor.”), 1380-81 (affirming Board’s finding of field of endeavor based on “title of the [] patent and...preamble of a...claim”). Thus, Petitioner’s identification of the ’775 patent’s field as “cable modem system”—except in connection with Fox—is substantiated by the traditional sources used to discern the “field of endeavor.”

In contrast, Petitioner does not explain why, when it discusses Fox, it switches its identification of the ’775 patent’s field from “cable modem systems” to generic “techniques for efficient networking,” a phrase that, like the phrase “efficient networking,” appears nowhere in the patent, where, in contrast, the term “cable modem” appears 123 times. In sum, Petitioner offers nothing to show that

“techniques for efficient networking” is the ’775 patent’s field.

The reason for this attempted switcheroo is that Fox has nothing particular to do with cable modems at all. Fox never mentions cable TV, modems, or cable modems: its title is “Decoupling Processes From Hardware With Logical Identifiers.” Ex.-1009 [Fox], 1:1-2. Unable to situate Fox in a field of cable modem systems, Petitioner seeks another field into which Fox and the ’775 patent might fit. But there is no authority for switching the subject patent’s “field of endeavor” without explanation or justification in this manner when comparing it to different references for analogousness purposes.

Because Petitioner wholly fails to prove that Fox is analogous art to the ’775 patent, it is not available as a part of its combination. Consequently, Petitioner cannot contend that the claims are obvious based upon a combination of Perlman, Crocker, and Fox. *See Klein*, 647 F.3d at 1348, 1352.

C. Perlman And Crocker Do Not Disclose Or Render Obvious The CME’s “DOCSIS MAC Processor Configured To...Forward The Processed Packets Directly To The [DNE] Without The Involvement Of The DOCSIS Controller” (Limitation 18[i], All Claims).

As to the “DOCSIS controller and...DOCSIS MAC processor” included in the CME, limitation 18[i] requires that “the DOCSIS MAC processor [be] configured to *process* downstream PDU packets and *forward the processed packets directly to the data networking engine* without the involvement of the

DOCSIS controller.” Thus, the CME’s DOCSIS MAC processor must **process** and **forward** downstream PDU packets directly to the DNE without involvement of the CME’s DOCSIS controller. Petitioner argues that it was obvious to add the “DOCSIS controller” and “DOCSIS MAC processor” to Perlman, and relies on the combination of Perlman and Crocker as disclosing or rendering obvious the claimed forwarding of packets. Neither is shown.

The Petition concedes that Perlman does not disclose a DOCSIS MAC processor or DOCSIS controller as claimed. Pet., 66. The Petition first asserts that both were obvious to add in view of Perlman alone, alleging the “POSITA would have been motivated to include conventional components such as a controller and processor in the DOCSIS component of Perlman in order to process the data.” *Id.*, (citing Ex.-1003 [Martin-Decl.] ¶195). This assertion is a “mere conclusory statement[.]” like the ones found insufficient in *Magnum Oil*. 829 F.3d at 1380; Section III.B.2. Petitioner does not allege any reason the POSITA would be motivated to add these components to Perlman, such as, *inter alia*, what benefits would be rendered from this addition. *But see Arctic Cat*, 795 Fed. App’x. at 833 (noting that obviousness determination must “weigh the benefits and drawbacks of [the] modification against each other, to determine whether there would be a motivation to combine”); *Belden*, 805 F.3d at 1073 (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated*

to make the combinations or modifications of prior art to arrive at the claimed invention.”) (emphasis in original). Petitioner fails to even address how these components could be added, and offers no evidence supporting its conclusory assertion that it was “conventional” and obvious to have a separate DOCSIS controller and DOCSIS MAC processor as disclosed and claimed in the ’775 patent.

Petitioner contends that “Perlman’s ‘DOCSIS logic 233 [is] for **processing** packetized DOCSIS data/content.’” Pet., 66 (citing Ex.-1007 [Perlman] ¶27; Ex.-1003 [Martin-Decl.] ¶197). But the claims do not merely require “processing” packets, but also “forward[ing] the processed packets.” Petitioner does not contend Perlman discloses (or renders obvious) forwarding the processed packets, nor that Perlman discloses (or renders obvious) “direct[ing]” “forward[ing]” of “downstream PDU packets...to the data networking engine without the involvement of the DOCSIS controller.” Pet., 66-67. On the contrary, splitting a DOCSIS system’s architecture into three components so that distinct functions may be “pipe-lin[ed]” to specific processors to improve performance and allow packet bypass was an innovation of the ’775 patent, and this innovation is not found in Perlman. *See* Section II; Ex.-1001 [’775] 2:55-58, 4:41-57.

Petitioner’s parroting expert provides no further explanation. Pet., 66; Ex.-1003 [Martin-Decl.] ¶195. Petitioner’s expert’s statement that this would be

“conventional and well known” relies on nothing more than *ipse dixit*. But it is well-settled that such missing limitations cannot be supplied by conclusory statements 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. Cir. 2014); *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.’”). Petitioner fails to show the technology was simple or straightforward. On the contrary, as just discussed above, this packet bypass architecture was innovative and required a novel subdivided architecture for these functions. See Section II; Ex.-1001 [’775] 2:55-58, 4:41-57. In sum, Petitioner has not shown the POSITA would have been motivated to modify Perlman to add these components.

In the alternative, Petitioner turns to Crocker’s additional teachings to fill these gaps in Perlman. They do not.

Petitioner asserts that “Crocker...describes forwarding packets to the line card 735 for data networking: ‘packets are forwarded by the forwarding engine to a data network interface 735a.’” Pet., 67 (citing Ex.-1008 [Crocker] 14:66-15:2; Ex.-1003 [Martin-Decl.] ¶¶198-200). As Petitioner admits, Crocker’s “forwarding engine” is not shown as part of its line card 731, which Petitioner relies on for the

“DOCSIS MAC processor” that must do the packet forwarding recited in the claim language. Pet., 66-67 (admitting the “forwarding engine is not pictured as part of the line card 731”).

To bridge this gap between the references and the claimed invention, Petitioner offers only a conclusory assertion that “it would be a trivial modification to have the DOCSIS processor 855 of the line card 731 perform this function.” *Id.* (citing Ex.-1003 [Martin-Decl.] ¶200). Crocker never calls processor 855 a “DOCSIS processor,” and the Petition does not explain its use of the appellation; but even aside from that, Petitioner offers no evidence that this modification to make the (not-shown) “forwarding engine” of Crocker’s “line card 731” part of the combination’s purported “DOCSIS MAC processor” so as to supply the missing “forwarding” limitation of all the claims would be “trivial.” As shown above, under cases such as *Arendi*, *K/S HIMPP*, and *DSS*, missing limitations, particularly new and advantageous limitations, simply cannot be added in an obviousness analysis based on a bare assertion of “trivial[ity].” *See also* Section III.B.2 (citing authorities on conclusory statements).

Even if, *arguendo*, such modification would be “trivial,” no motivation for it is shown. Petitioner fails to show why the POSITA would want this capability in this combination, and no such reason is apparent. As discussed above, Perlman does not disclose a DOCSIS MAC or a DOCSIS controller. Section IV.A.1. The

POSITA had no evident reason to look to Crocker to modify Perlman to change forwarding between a nonexistent separate MAC processor and controller.

Petitioner asserts that it would be obvious to add these from Crocker to Perlman, Pet. 66-67, but even if that were shown (which it isn't), it can't be used as a reason for the **further** modification to add the claimed bypass. "To entertain such an argument would be to allow [Petitioner] to hoist itself by its own bootstraps."

Selman v. United States, 498 F.3d 1354, 1356 (Ct. Cl. 1974). Rather, the addition of the claimed forwarding from the DOCSIS MAC processor without involvement of the DOCSIS controller must be found obvious **on top of** the alleged obviousness of adding those other missing elements to make that claimed bypass possible at all.

Furthermore, Petitioner's theory requires Crocker's "data network interface" (the component the packets would be forwarded to) to be part of the DNE. Pet., 67. The Petition asserts that the combination's "DNE" would be Perlman's MPEG-2 logic, but does not explain how Crocker's "data network interface" would relate to Perlman's MPEG-2 logic or how or why the POSITA would have incorporated the one into the other. And again, Petitioner has not explained how its proposed modifications to Crocker's purported DOCSIS MAC processor to forward packets in the bypassing manner claimed would or could be ported over to modify Perlman's relied-upon teachings, which feature no DOCSIS MAC processor. It also does not explain what Crocker's "data network interface" has to

do with MPEG-2, what it would be used for, or how it would work. Ex.-2003 [Russ-Decl.] ¶¶134-135. Thus, there is not only no motivation shown, Petitioner fails to show, as “required,” “that a skilled artisan would have had a ‘reasonable expectation’ of success” in the combination. *Eli Lilly & Co. v. Teva Pharms. Int’l GmbH*, 8 F.4th 1331, 1345 (Fed. Cir. 2021).

Petitioner fails to show the combination renders these limitations obvious.

D. Perlman And Crocker Do Not Disclose Or Render Obvious “A Data Bus That Connects The Data Networking Engine To The Cable Modem Engine” (Limitation 18[j], All Claims).

Limitation 18[j] requires “a ***data bus*** that connects the data networking engine to the cable modem engine.” For this limitation, Petitioner relies on Perlman or, in the alternative, Crocker. However, Perlman and Crocker are not shown to disclose such a bus. Even if Crocker discloses such a bus connecting its purported DNE and CME, Petitioner shows no motivation to combine it with Perlman with a reasonable expectation of success. (Furthermore, the combination is not shown to disclose a DNE for the bus to connect to, as discussed below in Section IV.E.)

Petitioner asserts Perlman discloses a “data bus” connecting the “MPEG-2 logic,” the purported DNE, and the “DOCSIS logic,” the purported CME. Pet., 67-69. It alleges that “Perlman shows the MPEG-2 logic 232 and DOCSIS logic 233 [are] connected,” so must therefore “disclose that such a connector ***could*** be a

bus.” *Id.* (citing Ex.-1007 [Perlman] Fig. 2a). Nothing supports this conclusory statement.

First, it is not shown that there is a connector connecting Perlman’s MPEG-2 logic and DOCSIS logic. Perlman discloses, as shown in Fig. 2a, that the **QAM** is connected to the MPEG-2 decoder and DOCSIS logic, sending information to both of those two components:

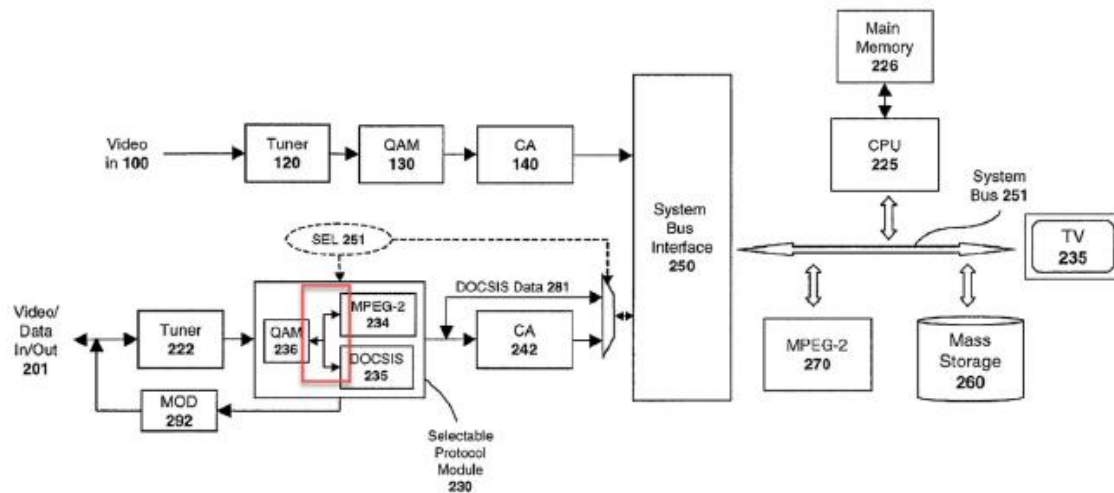


FIG. 2a

Ex.-1007 [Perlman] Fig. 2a (annotated). Perlman does not expressly depict or describe any connection, let alone mechanism to send information, **between** the MPEG-2 logic and DOCSIS logic. The two are not disclosed to communicate with each other—nor are they shown to have a reason to. Perlman teaches the MPEG-2 logic and DOCSIS logic perform distinct functions and only one is “selected” by the “selection logic 251” for a respective purpose. Ex.-1007 [Perlman] [0023]

(“MPEG-2 logic...process[es] multimedia cable/television channels and DOCSIS logic...process[es] packetized data according to the DOCSIS standard”); *see also id.*, [0024]-[0025]. Thus, there is no showing of sending of data, much less a data bus, connecting Perlman’s MPEG-2 logic to its DOCSIS logic. Ex.-2003 [Russ-Decl.] ¶¶140-142.

Since Petitioner is asserting that Perlman discloses this limitation, Petitioner’s argument must be rooted in inherency, but Petitioner does not assert the alleged “connector” between the purported DNE and CME “necessarily” is a bus, only that it “*could*” be. Pet., 68-69. This assertion, on its face, is insufficient to show inherency. Section III.A, *supra* (collecting authorities). Moreover, the Petition fails to even show the connector “could” be a bus. Perlman describes MPEG-2 234 and DOCSIS as “*logic[s]*.” Nothing indicates physical connection between Perlman’s MPEG-2 and DOCSIS, and Petitioner points to no physical connector or connecting hardware. Thus, the POSITA would not understand that any “connector” between Perlman’s MPEG-2 logic and DOCSIS logic could, let alone would, be the claimed “data bus.”

Perlman expressly discloses multiple “bus[es],” including system bus interface 250 and system bus 251. In contrast, Perlman does not describe any connection between MPEG-2 logic 232 and DOCSIS logic 233 as a bus, nor denote any connector between them as a bus in its drawings.

Petitioner alternatively asserts Crocker discloses a “**data bus**” connecting “line cards 731 and 753,” citing Crocker’s Figure 7. Pet., 68-69 (“Crocker explains that the ‘lines [*sic*] cards...may be configured to use at least one common dedicated line or back plane (e.g. 745).[’] ... Such connectors can include, ‘for example, a backplane line **or system bus.**’”) (citing Ex.-1008 [Crocker] 15:15-18; Ex.-1003 [Martin-Decl.] ¶207). Petitioner is playing fast and loose with Crocker’s disclosure. Petitioner’s citation of Crocker at 15:15-18, regarding a “system bus,” is with respect to the connection between “Routing Engine A 701a...to Routing Engine B 701b,” which is instead **connector 746** of Fig. 7. Ex.-1008 [Crocker] 15:15-18.

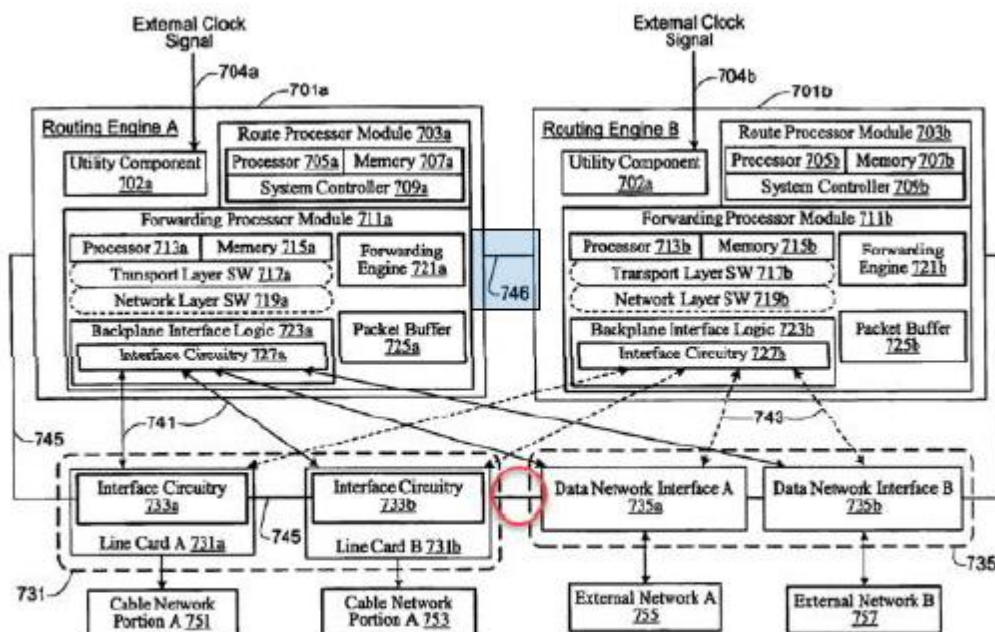


Figure 7 700

Ex.-1008 [Crocker] Fig. 7 (annotated). Crocker makes no such disclosure with respect to ***line cards 731 and 735***, Petitioner's purported DNE and CME. Thus, Petitioner's argument stitches together a disclosure of a bus with Crocker's Figure 7, misleadingly suggesting that Crocker discloses that its line cards 735 and 731 are disclosed as connected by a bus. In fact no such disclosure with respect to line cards 735 and 731 exists: the alleged bus is between routing engines 701a and 701b.

To the extent that Petitioner relies on inherency in Crocker, Petitioner has not shown that a data bus is "necessarily present" in Crocker connecting the line cards 735 and 731. *See* Section III.A (citing authorities). Petitioner does not point to any disclosure of what the line connecting those line cards is and, as can be seen in the figure above, bus 746 connects two routing engines, not line cards 731 and 735. Petitioner, thus, has not shown a "data bus" is "necessarily present" connecting Crocker's purported CME and DNE.

Thus, there is no disclosure that Crocker's purported DNE and CME (Crocker's line cards 735 and 731, respectively) are connected by a "data bus." But even if Crocker ***did*** disclose such a data bus, there is no indication why Perlman would be modified as the Petition proposes in this combination, since, as discussed, Perlman's system does not disclose any physical connector between its purported CME and DNE. Petitioner has shown no motivation to modify Perlman

to add such a connection, much less one in the specific form of a bus, or any benefits from such a modification. Pet., 67-69. If anything, such a modification would unnecessarily complicate Perlman’s system. Ex.-2003 [Russ-Decl.] ¶¶145-146. Again, Perlman teaches the MPEG-2 logic and DOCSIS logic are selected alternatives of the other to perform distinct functions. Ex.-1007 [Perlman] [0023] (“MPEG-2 logic... process[es] multimedia cable/television channels and DOCSIS logic...process[es] packetized data according to the DOCSIS standard”); *see also id.*, [0024]-[0025]. Perlman doesn’t disclose any interaction between the MPEG-2 logic and DOCSIS logic, or any reason data would need to flow between them, so there is no reason the POSITA would be motivated to connect them via a data bus. Ex.-2003 [Russ-Decl.] ¶140. Petitioner has further failed to show **how** Crocker’s purported data bus could be added to Perlman. Again, this would change Perlman’s architecture and tend to complicate its system, with no shown benefit. Ex.-2003 [Russ-Decl.] ¶¶145-146.

Lastly, as discussed in Section IV.E, *infra*, neither Perlman nor Crocker discloses or renders obvious a DNE, and thus could not also disclose a “data bus” connected to a DNE.

The Perlman-Crocker combination does not render limitation 18[j] obvious.

E. Perlman And Crocker Do Not Disclose The “Data Networking Engine” That “Perform[s] Home Networking Functions Including Interfacing With Customer Provided Equipment” (Limitations 18[a]-[b], All Claims).

Limitations 18[a]-[b] requires a “DNE” that “perform[s] home networking functions including interfacing with customer provided equipment.” Petitioner contends that “[t]he combination of Perlman and Crocker disclose” a DNE. Pet., 46. Neither reference, however, discloses a DNE, much less one that necessarily performs “home networking functions including interfacing with customer provided equipment” as the claims require.

First, Petitioner contends Perlman’s “MPEG-2 logic is a data networking engine” because it “process[es]” “multimedia cable/television channels” and “the incoming multimedia content.” Pet., 46. Its argument is conclusory, and does not explain why such activities would render “MPEG-2 logic” a DNE. Nor is there reason to assume that Perlman’s MPEG-2 logic is a DNE. The exemplary DNE, as described in the ’775 patent, is described as “responsible for all data networking processing,” with examples of functions the DNE might perform described as “advanced multi-port bridging/routing with NAT/firewall and VPN...and home networking applications.” See Ex.-1001 [’775] 3:49-53. As a further example, in certain embodiments, “as seen in Fig. 1, [the] data networking engine is capable of additional CPE functionality such as Ethernet, USB and other LAN I/F

communications...with appropriate CPE drivers” *Id.*, 3:63-66. While a system need not perform all of these functions to qualify as a DNE, Petitioner points to no capability in MPEG-2 logic remotely like these exemplary functions, or even offer an argument that any are analogous. And the Petition offers no explanation of how the different and more limited actions it points to (processing multimedia channels and incoming multimedia content) would be enough to make MPEG-2 logic a DNE. Ex.-2003 [Russ-Decl.] ¶¶151-153. The Petition has thus failed to meet its burden.

Furthermore, the POSITA would not have understood the MPEG-2 decoder to be a DNE as claimed. Perlman’s MPEG-2 logic is only disclosed to “process[] multimedia cable/television channels” and “content,” but not to perform any of the other above-referenced functions that an exemplary DNE might perform. Indeed, the POSITA would have generally understood that MPEG-2 decoders perform no network functions at all. Ex.-2003 [Russ-Decl.] ¶¶152-153. Thus, Perlman’s MPEG-2 decoder is not shown to perform functions of a DNE, or to be a DNE. Ex.-2003 [Russ-Decl.] ¶152-153.

Even if, *arguendo*, Perlman’s MPEG-2 logic were a DNE as claimed, Petitioner does not show that it “performs home networking functions including interfacing with customer provided equipment” as further required. Petitioner asserts that the MPEG-2 logic performs “home networking functions” because it

processes multimedia cable television channels and incoming multimedia content.

Pet., 49-50. Citing its declarant, Petitioner contends that:

Further “if a user is watching a first cable channel via tuner 120 and decides to concurrently record a second cable channel or watch the second channel on a separate display or picture-in-picture window, the second tuner 222 will lock on to the second channel responsive to the user’s request and the selection logic 251 will select the MPEG-2 logic 234...for processing the incoming multimedia content from the second channel.” Ex. 1007, ¶24.

Further, Perlman describes that using prior art systems, “a user is able to concurrently receive two cable broadcast channels while communicating over the Internet (e.g., sending email, browsing Web pages, downloading interactive content related to a particular TV program, ...etc.).” Ex. 1007, ¶28.

Pet., 50.

But the above-referenced functions of Perlman’s MPEG-2 logic are not “home networking functions including interfacing with customer provided equipment.” Perlman describes its MPEG-2 logic as processing and decoding incoming media content, but not as performing home networking functions. Nor is Perlman’s MPEG-2 logic disclosed to interface with customer provided equipment. Once content is decoded, the MPEG-2 logic provides it to Perlman’s CA module 242, which further determines whether to provide the user access to

the content. Indeed, to a POSITA, “distribution of decoded video from the output of an MPEG-2 decoder over a home network would be a bug, not a feature—it is actually a blatant security issue.” Ex.-2003 [Russ-Decl.] ¶154. Dr. Russ explains:

The distinction between Perlman’s MPEG-2 logic functions and the functions of the DNE of the ’775 patent is shown by Perlman’s disclosures that Perlman’s MPEG-2 processes the channels and content but ultimately does not interface with customer provided equipment. Ex. 1007 [Perlman] [0023] (“MPEG-2 logic 234...process[es] multimedia cable/television channels”), [0024] (“the selection logic 251 will select the MPEG-2 logic 234...for processing the incoming multimedia content from the second channel”). It is a different component, Perlman’s CA 242 processor, depicted in annotated Fig. 2 below, that interfaces with the customer provided equipment. *Id.*, [0024] (“The CA module 242 of this embodiment will then operate on the incoming multimedia content as described above (*i.e.*, providing access to the channel/content only if the user has the right to view it).”).

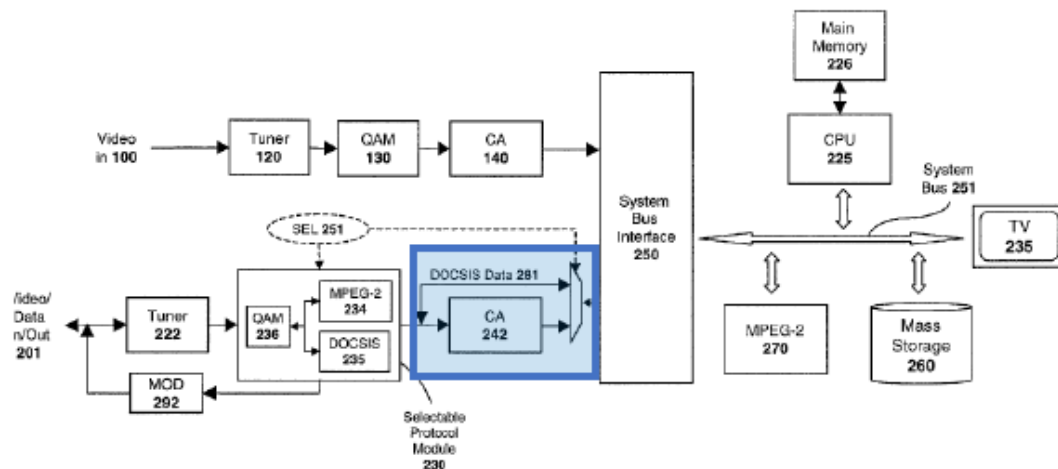


FIG. 2a

Ex. 1007 [Perlman] Fig. 2a (annotated). As can also be seen in the figure above, MPEG-2 interfaces with CA 242 and there is no indication that MPEG-2 “interfaces” with consumer premises equipment, such as the TV. To the extent the CA does interface with a TV, it is over a direct connection, such as an HDMI connector, and not over a network. Again, sending decoded video over a network is a major security issue.

Ex.-2003 [Russ-Decl.] ¶155. Thus, Petitioner has not shown that Perlman’s MPEG-2 logic is a DNE, let alone one that performs “home networking functions including interfacing with customer provided equipment.”

Alternatively, Petitioner asserts Crocker discloses a DNE. Pet., 46.

Petitioner asserts that “Crocker describes ‘line cards 735’” that “include a ‘data network interface 735a [which] functions as an interface component between *external data sources and the cable system*,” and thus that “[t]he line card 735,

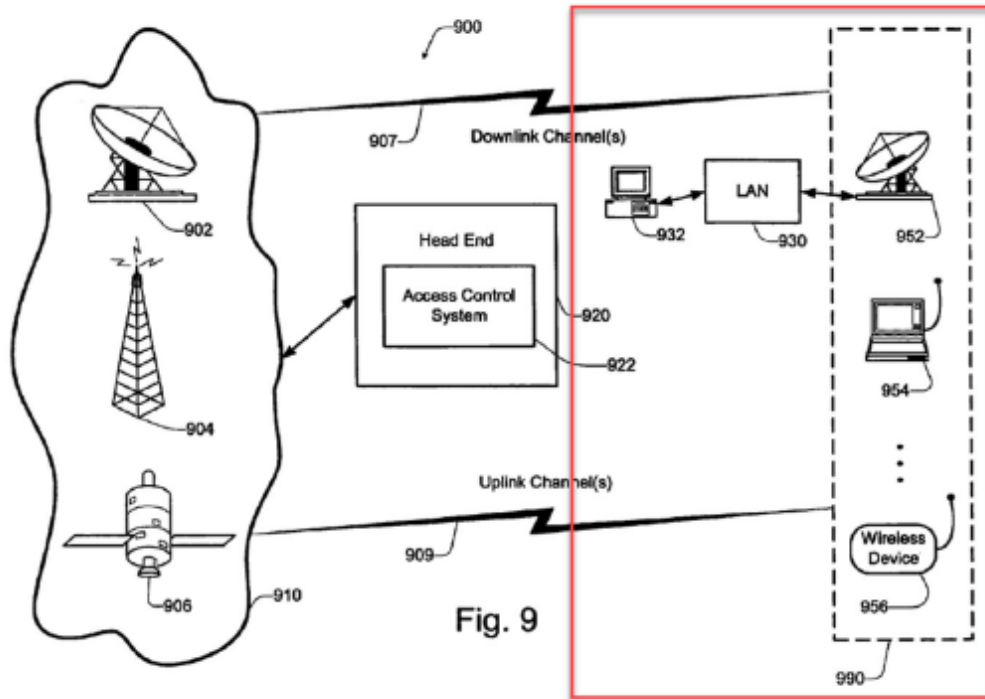
including the data network interface 735a, therefore is a data networking engine.”

Pet., 46-47. Petitioner concludes that because line card 735 “functions as an interface component between external data sources and the cable system,” it is a DNE.

However, a DNE is not met simply by anything that “interfaces” with “external data sources” and the “cable system.” “Interfacing” with a cable system is not listed in any of the exemplary functions of a DNE which the ’775 patent discloses (already discussed above), and so would not be enough to indicate a data networking engine. Nor is interfacing with the Internet (which Crocker cites as an example of an “external data network”) a function of a DNE. Ex.-1008 [Crocker] 15: 16:26-32 (giving example of “external data network” as “the Internet”). Nowhere does Petitioner point to disclosure that Crocker’s “data network interface 735a” performs any functions associated with data networking, or how data network interface 735a interacts with home networking applications or customer provided equipment. Petitioner has not shown that Crocker’s line card 735, with its data network interface 735a, is a DNE.

Even if, *arguendo*, Crocker’s line card 735 was a DNE, Petitioner fails to show it performs home networking functions including interfacing with customer provided equipment, as claimed. Petitioner asserts Crocker’s “line cards 735” “perform[] home networking functions” by “connecting the CMTS to external

networks” which “utilize different types of communication protocols (e.g. Ethernet, Frame Relay, ATM, TCP/IP, etc.)” wherein “Crocker describes such data networking including interfacing with customer provided equipment:”



Pet., 50-52 (citing Ex.-1008 [Crocker] 15:50-53, 22:11-22:22, Fig. 9 (annotated)).

However, Petitioner’s assertion that Crocker discloses a “data networking engine” that “interfac[es] with *customer provided equipment*” misapprehends Crocker.

Crocker discloses **CMTS architecture** on the **cable provider’s side**, not a cable modem architecture on the **subscriber’s side**. Ex.-1008 [Crocker] 1:50-52 (“the Head End complex 102 typically includes a **Cable Modem Termination System (CMTS)**”). See Ex.-2003 [Russ-Decl.] ¶¶160-162 (discussing Exs. 2004 and 2005); see Section IV.A.2 (discussing difference between CMTS and cable modem

system). Because Crocker's system is at the cable provider's side, or the head-end, the "data network interface" allegedly disclosed in Crocker is not configured to interface with **customer** provided equipment (such as Internet-enabled devices in a customer's building) but instead interfaces with an **external network** (e.g., Internet) at the cable headend. Thus, Crocker's CMTS supports interactions with cable modems downstream of it, and external networks upstream of it. A CMTS, as the system a cable provider uses at the headend, thus handles different functions than a cable modem system on the subscriber end. Crocker does not disclose a "data networking engine" which "interfac[es] with customer provided equipment," because there **is no** customer provided equipment to interface with the CMTS at the head-end of Crocker's network. See Ex.-2003 [Russ-Decl.] ¶162.

Lastly, even if Crocker did disclose a DNE, there would be no motivation or reasonable expectation of success for such a modification of Perlman. Petitioner asserts "[a] POSITA would be motivated to modify the MPEG logic of Perlman with the line cards 735 of Crocker" because they have "similar functionality" and "would increase the flexibility of [Perlman's] system." Pet., 48. Petitioner further asserts that this combination would allow for easier modification and updating of Perlman's MPEG logic without affecting other components of the system, which it asserts "would increase flexibility of the system" and "lead to higher efficiency and lower cost than in conventional systems." *Id.*, 48-49. As discussed in Section

IV.A.2 *supra*, Petitioner does not explain how Perlman’s MPEG logic has similar functionality to Crocker’s line card 735, nor how their combination would result in these benefits. Petitioner merely states these benefits would result. *Id.* Indeed, as discussed above, Section IV.A.2, because Crocker discloses a CMTS, the POSITA would not be motivated to use it to modify Perlman, which Petitioner itself calls a “cable modem” system, which is subscriber-side. Pet., 15. Thus, Petitioner has not shown motivation or expectation of success for the modification to meet this limitation.

Perlman and Crocker are not shown to render this limitation obvious.

V. CONCLUSION

For these reasons, institution should be denied.

Respectfully submitted,

/ Kenneth Weatherwax /
Kenneth J. Weatherwax (Reg. No. 54,528)
Nathan Lowenstein, *pro hac vice* to be filed
LOWENSTEIN & WEATHERWAX LLP

Date: June 27, 2024

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Patent Owner Preliminary Response (the “POPR”) consists of 13,854 words, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The POPR complies with the type-volume limitation of 14,000 words as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare the paper (Microsoft Word).

Respectfully submitted,

/ Robert Pistone /

Date: June 27, 2024

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the following documents were served
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EXHIBITS 2003-2005

The names and addresses of the parties being served are as follows:

John C. Alemanni	jalemanni@kilpatricktownsend.com
Michael Turton	mturton@kilpatricktownsend.com
Vanessa Bell	Cox-Entropic-IPR@ktslaw.com

Respectfully submitted,

/ Robert Pistone /

Date: June 27, 2024