

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMCAST CABLE COMMUNICATIONS, LLC,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

IPR2024-00446
Patent 8,223,775 B2

Before LYNNE H. BROWNE, BARBARA A. PARVIS, and
FREDERICK C. LANEY, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Comcast Cable Communications, LLC (“Petitioner”) filed a Petition (Paper 2 (“Pet.”)) requesting *inter partes* review of claims 1–20 (“challenged claims”) of U.S. Patent No. 8,223,775 B2 (Ex. 1001, “the ’775 patent”). Entropic Communications, LLC (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”).

We have authority to determine whether to institute review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4. We may institute an *inter partes* review if “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314.

Upon consideration of the contentions and the evidence of record at this preliminary stage, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the ’775 patent. Accordingly, we grant Petitioner’s request and institute an *inter partes* review of all challenged claims of the ’775 patent and with respect to all grounds set forth in the Petition.

II. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies itself as a real party-in-interest. Pet. iv. Petitioner also identifies Comcast Corporation and Comcast Cable Communications Management, LLC as real parties-in-interest. *Id.* Patent Owner names itself as the real party-in-interest. Paper 3, 1.

B. Related Matters

Both parties identify, as matters currently involving the '775 patent, *Entropic Communications, LLC v. Comcast Corp. et al.*, No. 2:23-cv-01050 (C.D. Cal.) (“CDCA Litigation”), and *Entropic Communications, LLC v. Cox Communications, Inc. et al.*, No. 2:23-cv-01049 (C.D. Cal.). Pet. iv–v; Paper 3, 1; Paper 7, 1. The parties also identify a terminated federal district court case (*Entropic Communications, LLC v. Charter Communications, Inc. et al.*, No. 2:22-cv-00125 (E.D. Tex.)) which involved the '775 patent. Pet. v; Paper 3, 1; Paper 7, 1.

Patent Owner also identifies a second petition challenging the '775 patent as *Cox Communications, Inc. et al. v. Entropic Communications, LLC*, IPR2024-00579 (PTAB). Paper 3, 1; Paper 7, 1.

C. The '775 Patent

The '775 patent is titled “Architecture for a Flexible and High-Performance Gateway Cable Modem.” Ex. 1001, code (54). The '775 patent “relates to a cable modem system having a functionally partitioned and flexible architecture.” *Id.* at 1:7–10, 1:13–16.

Figure 1 of the '775 patent, reproduced below, is a block diagram of cable modem system architecture 100. *Id.* at 2:49–50.

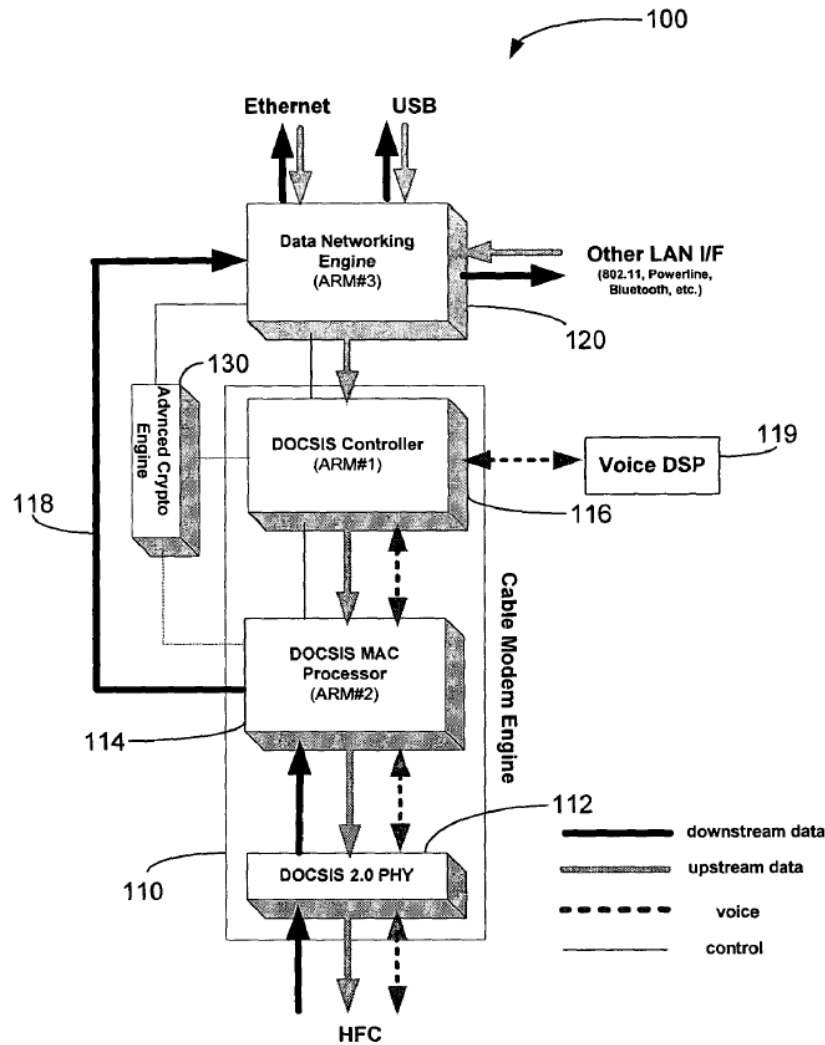


Figure 1

Figure 1 is a block diagram of cable modem system architecture 100. *Id.* at 2:49–50.

Cable modem system architecture 100 shown in Figure 1 includes three major subsystems: cable modem engine (CME) 110, data networking engine (DNE) 120, and advanced crypto engine (ACE) 130. *Id.* at 2:49–54. Cable modem engine 110 is divided into three functional blocks: Data Over Cable Service Interface Specification (DOCSIS) physical (PHY) layer 112,

DOCSIS Media Access Control (MAC) processor 114, and DOCSIS controller 116. *Id.* at 2:55–59.

Figure 2, reproduced below, is a functional block diagram implementing the cable modem architecture of Figure 1. *Id.* at 2:44–45.

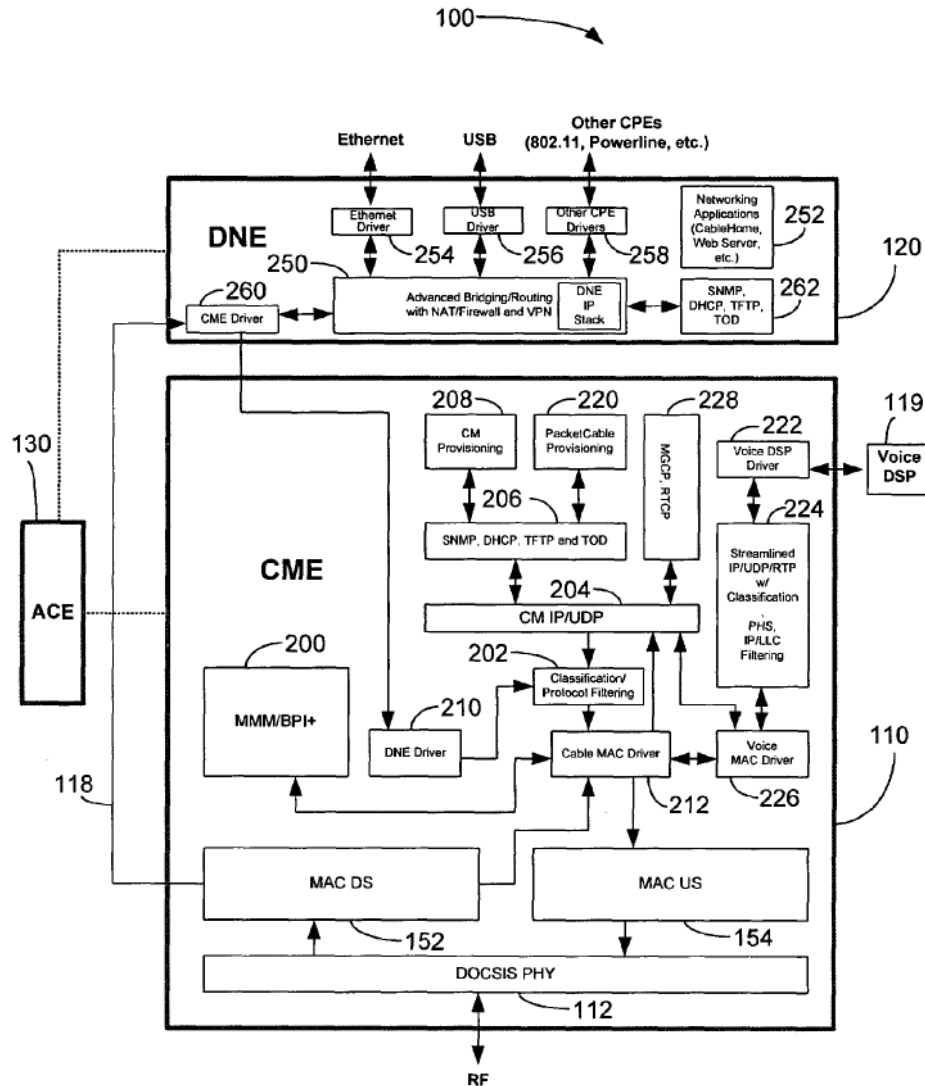


Figure 2

Figure 2 is a functional block diagram illustrating in greater detail cable modem engine 110 and data networking engine 120. *Id.* at 2:53–55.

As shown in Figure 2, processor 114 is represented by MAC downstream (DS) block 152 and MAC upstream (US) block 154. *Id.* at

3:18–20. Controller 116 implements DOCSIS functions as follows: MAC management message (MMM)/(baseline privacy interface) BPI+ (block 200), classification and protocol filtering (block 202), cable modem Internet Protocol (IP)/User Data Protocol (UDP) (block 204), simple network management protocol (SNMP), dynamic host configuration protocol (DHCP), trivial file transfer protocol (TFTP) and time of day (TOD) functionality (block 206), and cable modem provisioning (block 208). *Id.* at 3:25–38.

Controller 116 also implements PacketCable functionality (blocks 220–228). *Id.* at 3:39–42. PacketCable functionality includes provisioning (block 220), voice digital signal processor (DSP) driver (block 222), streamlined IP/UDP/Real Time Transport Protocol (RTP) with classification; PHS, IP/Logical Link Control (LLC) filtering (block 224), voice MAC driver (block 226). *Id.*

Data networking engine 120 is responsible for data networking processing including advanced multi-port bridging/routing with network address translation (NAT)/firewall and virtual private network (VPN) (block 250), and home networking applications (CableHome and Web Server) (block 252). *Id.* at 3:49–53. The entire embedded portal services (PS) functionality of the CableHome specification is contained within data networking engine 120, with the CableHome functionality being decoupled from the PacketCable and DOCSIS functionality provided by cable modem engine 110. *Id.* 3:53–58.

D. Illustrative Claims

Petitioner challenges claims 1–20 of the ’775 patent. Pet. 9–10. Claims 1, 14, and 18 are independent claims. Claims 2–13 depend, directly

or indirectly, from claim 1, claims 15–17 depend from claim 14, and claims 19 and 20 depend from claim 18. Independent claim 18, reproduced below, is illustrative of the claimed subject matter.

18. [18A¹] A cable modem system comprising:

[18B] a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment;

[18C] a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media, and [18D] 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, [18E] the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor, [18F] the 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 in order to boost downstream throughput; and

[18G] a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely

¹ Herein we use Petitioner's designations for the elements of claim 18. Pet. 80–85.

partitioned from the home networking functions performed by the data networking engine.

Ex. 1001, 7:33–8:27.

E. Evidence

Petitioner relies on the patent references summarized in the table below.

Name	Reference	Exhibit
Rabenko	US 2002/0006137 A1, filed May 8, 2001, published Jan. 17, 2002	1005
Gaspar	US 2004/0004974 A1, filed July 2, 2002, published Jan. 8, 2004	1006
Kim	US 2002/0091861 A1, filed May 31, 2001, published July 11, 2002	1007
Lu	US 2002/0078249 A1, filed Dec. 15, 2000, published June 20, 2002	1012
Klein	US 2004/0019765 A1, filed July 23, 2003, published Jan. 29, 2004	1016
Kim '678	US 2002/0138678 A1, filed Jan. 31, 2001, published Sept. 26, 2002	1015
Koperda	US 2002/0065935 A1, filed Feb. 26, 2001, published May 30, 2002	1010
Johnson	US 2004/0125754 A1, filed Aug. 1, 2003, published July 1, 2004	1009

Petitioner also relies on the Declaration of Sayfe Kiaei, Ph.D. (Ex. 1002) to support its contentions that the challenged claims are unpatentable. Patent Owner relies on the Declaration of Samuel H. Russ, Ph.D. (Ex. 2003) in support of its contentions that Petitioner has not shown that the challenged claims are unpatentable.

F. Asserted Grounds

Petitioner asserts that the challenged claims of the '775 patent are unpatentable based on the following grounds summarized in the table below (Pet. 9–10):

Claim(s) Challenged	35 U.S.C. §²	References/Basis	Ground name
1–7, 10, 12, 14, 15, 18–20	103(a)	Rabenko	A
1–7, 10, 12, 14, 15, 18–20	103(a)	Rabenko, Gaspar	B
1–7, 10, 12, 14, 15, 18–20	103(a)	Rabenko, Kim	C
1–7, 10, 12, 14, 15, 18–20	103(a)	Rabenko, Gaspar, Kim	D
1–7, 10, 12, 14, 15	103(a)	Each of Grounds A-D + Lu	E-H
12	103(a)	Each of Grounds A-H + Klein and Kim '678	I-P
8	103(a)	Each of Grounds A-H + Koperda	Q-X
9	103(a)	Each of Grounds Q-X + Johnson	Y-FF
11, 13, 16, 17	103(a)	Each of Grounds A-H + Johnson	GG-NN

III. ANALYSIS

A. *Legal Standards*

A patent claim is unpatentable under 35 U.S.C. § 103(a) when the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the challenged claims of the ’775 patent have an apparent effective filing date before March 16, 2013, the pre-AIA version of § 103 applies.

subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness, i.e., secondary considerations.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art

would have had at least a degree in computer or electrical engineering, computer science, information systems, or a similar discipline, along with three-to-four years of experience with the design and/or implementation of cable modems within network-based content delivery systems. Ex. 1002, ¶¶40-45. Additional education may substitute for professional experience, and significant work experience may substitute for formal education. *Id.*

Pet. 12.

At this stage of the proceeding, Patent Owner does not challenge the level of ordinary skill in the art proposed by Petitioner’s expert. *See generally* Prelim. Resp.

For purposes of this Decision, we adopt Petitioner’s proposal as reasonable and consistent with the ’775 patent specification and the prior art.⁴

³ The present record does not include any objective evidence of nonobviousness.

⁴ If Patent Owner disagrees with Petitioner’s formulation of the level of skill in the art, it must do so in its Response. If a different level of skill would affect the outcome in this case, the parties must brief that issue as well. The

C. *Claim Construction*

We interpret the challenged claims

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history.

Phillips v. AWH Corp., 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

Petitioner explains that in the terminated *Entropic Communications, LLC. v. Charter Communications, Inc. et al.*, No. 2:22-cv-00125 (E.D. Tex.) proceeding, Patent Owner advocated that the plain and ordinary meaning applies for all claim terms, and that position was adopted by the Court for all relevant claim terms with the exception of the following limitation: “wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine” (recited in claims 1, 14, and 18). Pet. 12–13 (citing Ex. 1011, 7–25, 61–62). Petitioner submits that the Court construed this limitation in claim 18 to mean “wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are

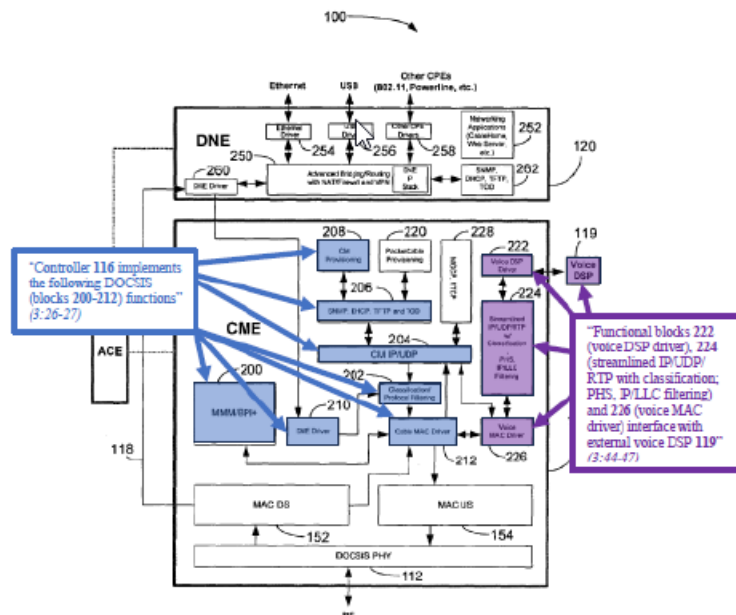
parties are also encouraged to submit evidence, other than conclusory expert testimony, that supports their position.

performed only by the data networking engine.” *Id.* (citing Ex. 1011, 17; Ex. 1002 ¶¶ 46–47).

Petitioner states in this proceeding “[a]ll claim terms should be given their ordinary and customary meaning” to a person of ordinary skill in the art. Pet. 12. Petitioner does not propose an express construction for any claim term. *Id.* at 12–13.

Patent Owner also does not propose an express construction for any claim term. *See generally* Prelim. Resp. Patent Owner’s dispute of Petitioner’s element-by-element analysis includes arguments relating to the ’775 patent Specification and the term “DOCSIS controller.” Prelim. Resp. 7–19. We discuss those arguments below.

Patent Owner argues that “the DOCSIS controller must ‘control’ DOCSIS functions” and that the ’775 patent “provides examples of such control, including the processing of management messages to/from the DOCSIS MAC, and MAC address learning.” Prelim. Resp. 14–15 (citing Ex. 2003 ¶¶ 43–44; Ex. 1001, 3:26–38). Patent Owner provides an annotated version of Figure 2 of the ’775 patent identifying DOCSIS function blocks.



Annotated Figure 2 of the '775 patent, above, is a functional block diagram illustrating in greater detail cable modem engine 110 and data networking engine 120 (Ex. 1001, 2:53–55) and includes Patent Owner’s blue textual and highlighting annotations identifying DOCSIS functions. Prelim. Resp. 17 (citing Ex. 1001, 3:25–38).

As shown in annotated Figure 2 above, Patent Owner’s blue textual and highlighting annotations identify DOCSIS functions as follows: MAC management message (MMM)/(baseline privacy interface) BPI+ (block 200), classification and protocol filtering (block 202), cable modem Internet Protocol (IP)/User Data Protocol (UDP) (block 204), simple network management protocol (SNMP), dynamic host configuration protocol (DHCP), trivial file transfer protocol (TFTP) and time of day (TOD) functionality (block 206), and cable modem provisioning (block 208). Prelim. Resp. 17 (citing Ex. 1001, 3:25–38). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor*

Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). At this early stage in the proceeding, we find that nothing in the language of the independent claims explicitly requires a controller that processes blocks 200 through 212 shown in Figure 2 of the '775 patent. Additionally, we do not find any definition or disclaimer (explicit or implicit) in the intrinsic record to limit the independent claims a controller that processes blocks 200 through 212 shown in Figure 2 of the '775 patent. See *Trustees of Columbia University v. Symantec*, 811 F.3d 1359, 1363–64 (Fed. Cir. 2016).

We must not “import into a claim limitations that are not a part of the claim.” See *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346–47 (Fed. Cir. 2015) (“This court has repeatedly cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification.” (internal quotation omitted)). Thus, “a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.” *SuperGuide*, 358 F.3d at 875.

For these reasons, at this preliminary stage, we decline to limit the claim term “DOCSIS controller” to a controller performing the specific functions identified by Patent Owner in the '775 patent Specification. Prelim. Resp. 17 (citing Ex. 1001, 3:25–38). “The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). At this preliminary stage in

the proceeding, we use the ordinary and customary meaning of the term and decline to provide further analysis or an express construction to resolve the dispute between the parties.

D. Asserted Obviousness of Claims 1–7, 10, 12, 14, 15, and 18–20 and Grounds A–D

Petitioner asserts that claims 1–7, 10, 12, 14, 15, and 18–20 are unpatentable as obvious over (1) Rabenko (Ground A); (2) the combination of Rabenko and Gaspar (Ground B), the combination of Rabenko and Kim (Ground C), and the combination of Rabenko, Gaspar, and Kim (Ground D). Pet. 9. Patent Owner disputes Petitioner’s showing for independent claims 1, 14, and 18 and Grounds A through D. Prelim. Resp. 2, 4–44.

We begin with an overview of the asserted art. We then turn to the parties’ arguments.

1. Rabenko (Exhibit 1005)

Rabenko is titled “System and Method for Supporting Multiple Voice Channels,” and discloses a communications system configured with a plurality of media terminal adapters, a telephone line, and a gateway configured to exchange voice and data packets between a network and each of the media terminal adapters over the telephone line. Ex. 1005, codes (54), (57). Figure 1b of Rabenko, reproduced below, illustrates a signal flow path in a residential gateway of a home telecommunications system. *Id.* ¶¶ 8, 44.

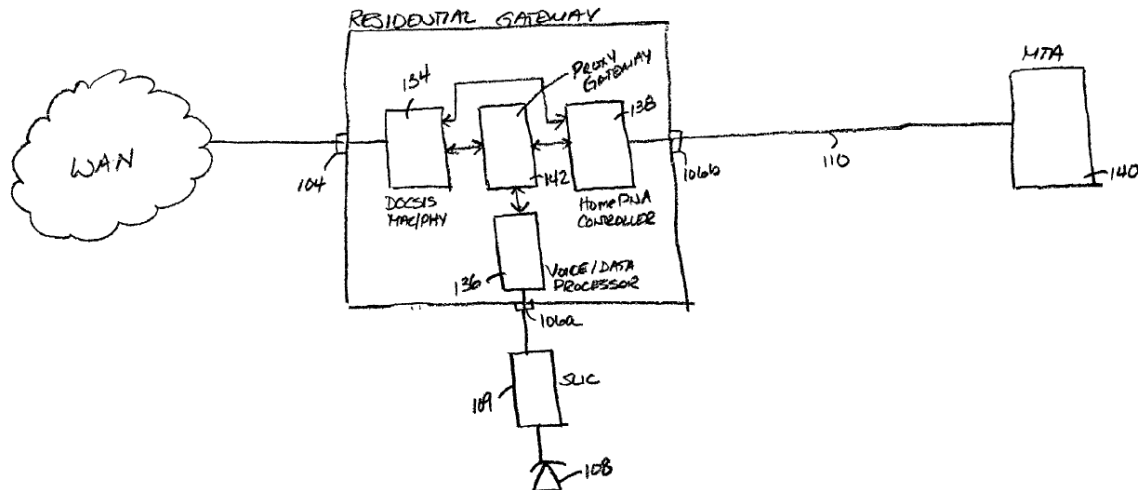
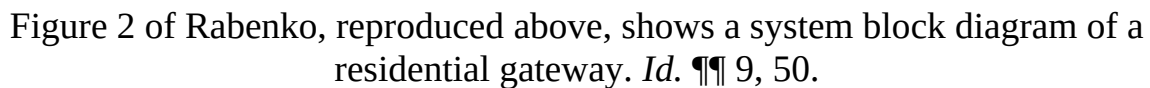


FIG. 1b

Figure 1b illustrates a signal flow path of packets in a residential gateway of a home telecommunications system. *Id.* ¶¶ 8, 44.

In Figure 1b, DOCSIS MAC/PHY 134 provides an interface to the wide area network (WAN) within residential gateway 102. *Id.* ¶ 44. All packets that arrive to or leave from the residential gateway via the WAN go through DOCSIS MAC/PHY 134. *Id.* DOCSIS MAC/PHY 134 translates the packet format from DOCSIS to an internal format that may be protocol independent. *Id.* In the downstream direction, DOCSIS MAC/PHY 134 determines whether the packet payload is voice or data. *Id.* ¶ 45. If the packet payload is data, then DOCSIS MAC/PHY 134 routes the packet directly to HomePNA controller 138, which translates the data packet to a HomePNA packet and transmits the HomePNA packet to a media terminal adapter (MTA) 140 (a HomePNA device) over HomePNA LAN 110. *Id.* Conversely, if DOCSIS MAC/PHY 134 determines that the packet payload is voice, the packet is routed to proxy gateway 142. *Id.* Proxy gateway 142 further determines whether the packet is destined for HomePNA LAN 110 or POTS telephone 108, and if the packet is destined for POTS telephone

Figure 2 of Rabenko, reproduced below, shows a system block diagram of a residential gateway. *Id.* ¶¶ 9, 50.



Rabenko provides that “[t]he described exemplary embodiment [in Figure 2] may provide a highly integrated solution implemented in a single chip that is compliant with the Data Over Cable Service Interface Specification (DOCSIS).” *Id.* ¶ 50. In Figure 2, a QPSK upstream modulator 202 is configured to transmit data to the cable head end, a QAM downstream demodulator 200 is configured to receive data from the cable head end, and a QPSK out of band downstream demodulator 206 is configured to receive out of band MPEG-2 encoded messages from the cable head end. *Id.*

The residential gateway includes voice and data processor 213. *Id.* ¶ 74, Fig. 2. The described embodiment of voice and data processor 213 supports the exchange of voice, as well as facsimile and modem, between POTS telephone 108 and the cable head end. *Id.* Rabenko explains that “voice and data processor 213 may be implemented with a variety of technologies including, by way of example, embedded communications software that enables transmission of voice over packet based networks,” where “[t]he embedded communications software is preferably run on a programmable digital signal processor (DSP).” *Id.* ¶¶ 74–75.

The residential gateway also includes HomePNA controller 138, which is a fully integrated MAC/PHY device that provides bi-directional communication with devices such as a HomePNA phone operating on a HomePNA LAN via a subscriber port of the residential gateway. *Id.* ¶ 80. HomePNA controller 138 may include DMA channels which are used for fast data communication of processed data to system memory 214 via ISB 218. *Id.* HomePNA controller 138 includes a digital PHY having a FDQAM/QAM transmitter and receiver coupled to an analog front end

(AFE) 226. *Id.* Thus, HomePNA AFE 226 couples the HomePNA controller to the HomePNA LAN. *Id.* ¶ 223.

2. *Gaspar (Exhibit 1006)*

Gaspar is titled “Method and System for Optimizing the Design of a Network Controller,” and discloses a system for networking computers in a home phone line network. Ex. 1006, codes (54), (57). The system includes a first controller that includes a physical layer (PHY) configured to be coupled to a phone line, and a media access control (MAC) configured to be coupled to the PHY. *Id.* at code (57). The MAC is separated from the PHY by a partition that enables the MAC to be implemented as a separate circuit from the PHY, such that the MAC can be modified during and after the design process while leaving the PHY intact. *Id.* By partitioning the MAC and PHY circuits, the MAC circuit can be implemented with a programmable device, such as an field programmable gate array (FPGA) and the controller can be debugged or upgraded by modifying the MAC circuit, leaving the PHY circuit intact. *Id.* ¶ 14.

3. *Kim (Exhibit 1007)*

Kim is titled “Modular-Type Home Gateway System Including ADSL Controller and HOME PNA Controller.” Ex. 1007, code (57). Figure 3 of Kim, reproduced below, is a block diagram of a modular-type home gateway system (100). *Id.* ¶¶ 20, 32.

FIG. 3

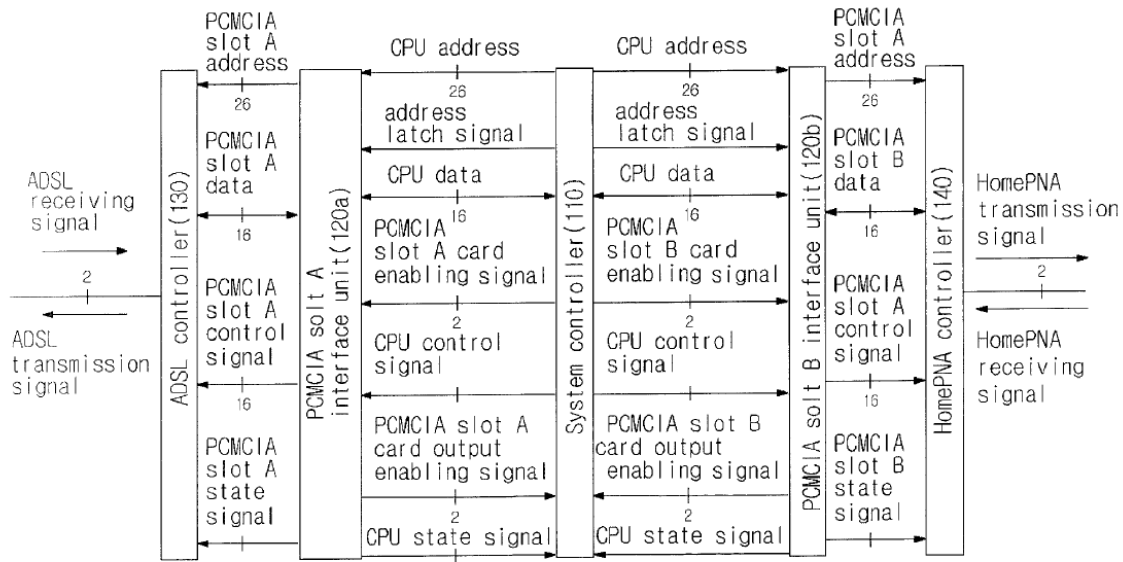


Figure 3 is a block diagram of modular-type home gateway system 100. *Id.* ¶¶ 20, 32.

Modular-type home gateway system 100 includes, among other things, ADSL controller 130 and HomePNA controller 140. *Id.* ¶¶ 26, 42.

Kim describes the following:

Further, even when improving the performance of HomePNA controller or ADSL controller, the modular-type home gateway System maintains the system controller of the home gateway and replaces either the HomePNA controller or the ADSL controller, thereby improving the whole performance of the home gateway. The ADSL controller and the homePNA are embedded in the modular-type home gateway system. *Id.* ¶ 26.

4. *Independent Claim 18*

a) *Preamble [18A]: “A cable modem system comprising”*

Relying on the testimony of Dr. Kiaei, Petitioner argues “Rabenko discloses limitation [18A]” as “Rabenko discloses a communication system including a gateway with a cable modem (claimed ‘cable modem system’).” Pet. 13–14 (citing Ex. 1005 ¶¶ 34–35, code (57), Figs. 1b, 2; Ex. 1002 ¶¶ 83–84). Figure 1a of Rabenko illustrates “an exemplary in home telecommunications system” having residential gateway 102. Ex. 1005 ¶ 7, Fig. 1a. In residential gateway 102 “a cable modem is used as described by the CableLabs DOCSIS specification.” *Id.* ¶ 34.

At this stage of the proceeding, we need not determine whether the preamble of claim 18 is limiting as Petitioner has shown sufficiently for the purpose of institution that Rabenko teaches the preamble of claim 18.

b) *Limitation [18B]: “a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment”*

Petitioner argues that Rabenko’s “HomePNA controller 138 . . . along with AFE 226, functions as the ‘data networking engine.’” Pet. 14–16 (citing Ex. 1005 ¶¶ 45, 80, 223, 226, Figs. 1a, 1b, 11; Ex. 1002 ¶¶ 85–88).

Petitioner argues that the ordinarily skilled artisan would have understood Rabenko’s HomePNA controller 138 to be “a fully integrated MAC/PHY device” that would have included a processor to perform processing functions. *Id.* at 16 (citing Ex. 1005 ¶¶ 45, 46, 80, 268). Petitioner argues that Rabenko discloses that HomePNA controller 138 is compliant with

HomePNA Specification Version 2.0 to perform home networking functions including interfacing with customer provided equipment. *Id.* at 16–18 (citing, e.g., Ex. 1005 ¶¶ 3, 31–47, 80, 268, Figs. 1a, 1b, 2; Ex. 1002 ¶¶ 91–95).

Patent Owner argues that Petitioner has not shown that Rabenko’s HomePNA controller 138 and AFE 226 are in the “partitioned architecture claimed” and, therefore, Petitioner has failed to meet its burden with respect to limitations [18C] and [18G], which derive antecedent basis from limitation [18B]. Prelim. Resp. 19–32. Patent Owner’s arguments are discussed in sections III.4.c and III.D.4.g below.

Based on the preliminary record, we find that Rabenko supports Petitioner’s contentions and Petitioner has shown sufficiently that Rabenko teaches limitation [18B] for purposes of institution. Although Petitioner provides additional arguments based on Gaspar, in light of our finding that Rabenko teaches limitation [18B], we need not make further findings regarding Gaspar’s teachings.

c) Element [18C]: “a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media”

Petitioner argues that “Rabenko discloses limitation [18C]” particularly because “Rabenko discloses DOCSIS MAC 134/212 . . . , a proxy gateway 142 and voice/data processor 136/213 . . . (collectively, the

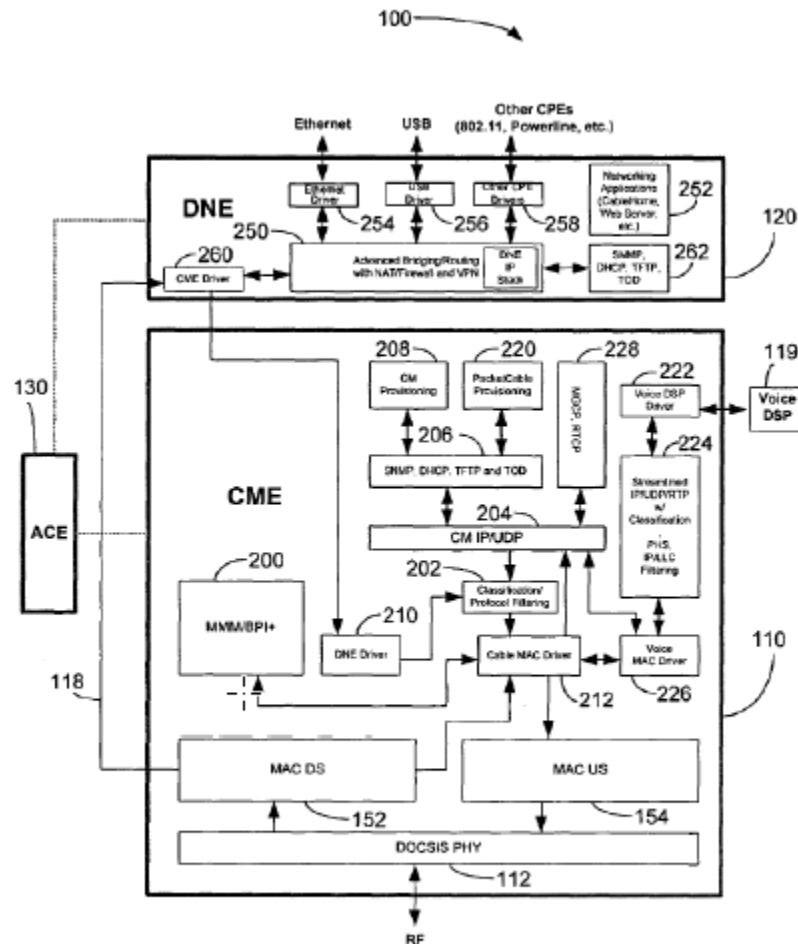
claimed ‘cable modem engine’) which are implemented in a second circuit performing cable modem functions according to the CableLabs Data Over Cable Service Interface Specification (DOCSIS).” Pet. 21–22 (citing Ex. 1005 ¶¶ 34, 50, Figs. 1b). Petitioner argues “Rabenko discloses that DOCSIS MAC 134/212 . . . , proxy gateway 142, and voice/data processor 136/213 . . . (‘second circuit’) are separate components from HomePNA controller 138 and AFE 226 (‘first circuit’).” Pet. 23 (citing Ex. 1005, Fig. 1b). Petitioner argues that Rabenko’s “integrated functions for communicating with a cable head []end” are the claimed “cable modem functions” and “specifically are cable modem functions for the claimed ‘interfacing with cable media.’” *Id.* at 22 (citing Ex. 1005 ¶¶ 33, 34, 50, 178, 197, Fig. 1b).

Patent Owner argues Petitioner has failed to meet its burden with respect to limitation [18C]. Prelim. Resp. 19–32. In particular, Patent Owner argues the following:

The claims recite a “data networking engine” (“DNE”) implemented in a “first circuit” and a “cable modem engine” (“CME”) implemented in a “second circuit,” “the second circuit being separate from the first circuit.” Ex. 1001 [’775] cls. 1[b]–[c], 14[b]–[c], 18[b]–[c].⁵ “[T]he home networking functions” performed by the DNE are “completely partitioned” from “the cable modem functions” performed by the CME. *Id.*, cls. 1[e], 14[d], 18[g].

Prelim. Resp. 19. Patent Owner refers to the aforementioned recitations as “[t]he partitioned architecture claimed in the [’775] Patent” and argues that “Rabenko simply lacks the partitioned architecture of the [’775] Patent.” *Id.* at 19, 24.

Patent Owner argues the '775 patent “clearly depicts and discloses a DNE in a first circuit partitioned from a CME in a separate circuit” and reproduces Figure 2 of the '775 patent, which is shown again below.



Ex. 1001 ['775] Fig. 2.

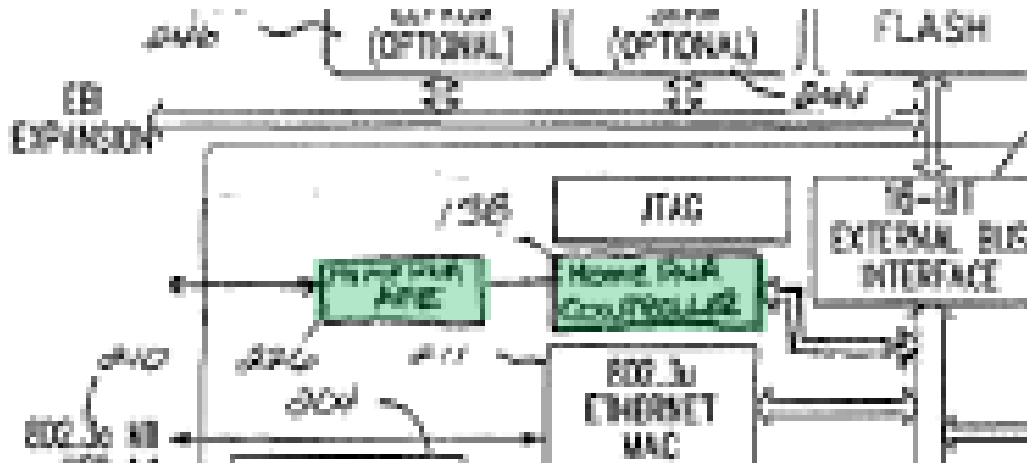
Figure 2 is a functional block diagram illustrating in greater detail cable modem engine 110 and data networking engine 120. *Id.* at 2:53–55.

Patent Owner argues “the Petition arbitrarily imposes its own, selecting with no significant explanation a handful of scattered components and declaring them to match the claimed” “data networking engine” and “cable modem engine.” Prelim. Resp. 22; *see also id.* at 26 (arguing the groupings “are simply superimposed by the Petition without any meaningful

explanation upon disclosure that does not support them”). Patent Owner argues that Rabenko “does not disclose any division into structures (i.e., engines at all, let alone the specific two engines disclosed and claimed” in the ’775 patent. *Id.* at 20–21 (citing Ex. 1005, Fig. 2). Patent Owner argues that “the Petition avoids characterizing the remaining components” shown in Figure 2 of Rabenko. *Id.* at 23. Patent Owner also argues that the components “must together constitute an ‘engine.’” *Id.* at 25. Patent Owner submits the declaration testimony of Dr. Russ in support of its position. Ex. 2003 ¶¶ 56–87.

At this preliminary stage, we consider Patent Owner’s arguments (Prelim. Resp. 19–32) and Dr. Russ’s testimony (Ex. 2003 ¶¶ 56–87) to be based on an overly narrow reading of limitation [18C] based on Figure 2 of the ’775 patent. Claim 18 does not require a division into structures that is identical to Figure 2 of the ’775 patent and does not require that “remaining components” in Rabenko’s Figure 2 be grouped into one of the two engines.

Limitation [18B] recites “a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed.” The data networking engine identified in the Petition is shown in the portion of Figure 2 of Rabenko, below. Pet. 14.

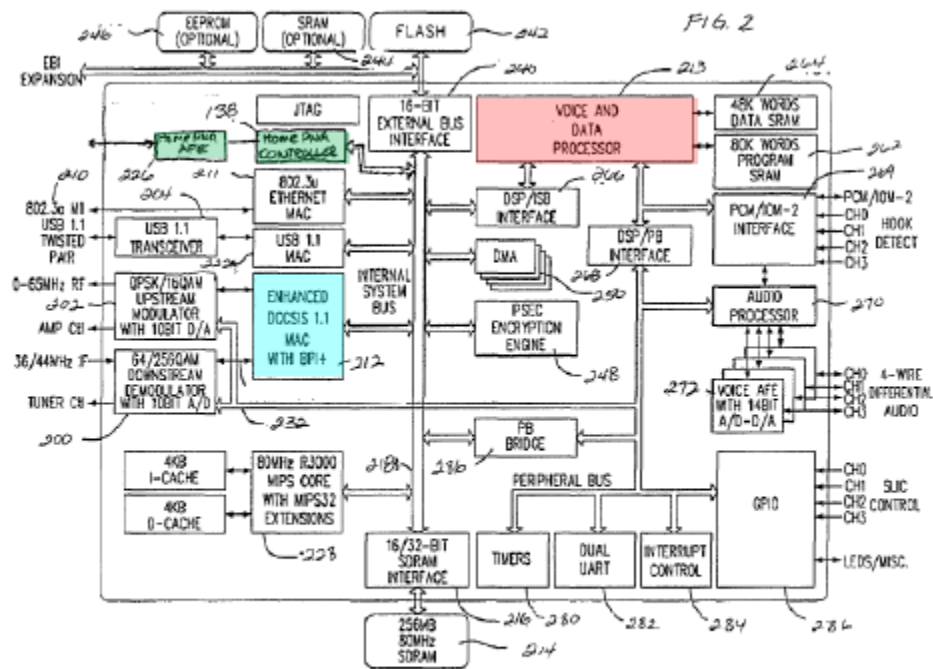


As shown in the annotated portion of Figure 2 reproduced above, Rabenko's HomePNA controller 138 and AFE 226 (annotated with Petitioner's green highlighting) are connected together and are separate from other components, except they are connected by internal system bus 218.

Ex. 1005, Fig. 2, ¶ 54; Pet. 24.

Claim 18 recites that “a data bus . . . connects the data networking engine to the cable modem engine.” Thus, the connection to internal system bus 218 is consistent with claim 18. Rabenko's HomePNA controller 138 and AFE 226 are otherwise separate from the remaining residential gateway. See Ex. 1005, Figs. 1b, 2.

Limitation [18C] recites “a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit.” For the cable modem engine recited in limitation [18C], Petitioner identifies DOCSIS MAC/PHY 134, proxy gateway 142, and voice/data processor 136 in Figure 1b and Enhanced DOCSIS 1.1 MAC with BPI+ 212, core 228, and voice and data processor 213 in Figure 2. Pet. 21, 24. Figure 2 of Rabenko is reproduced below with Petitioner's annotations.



Ex. 1005, Fig. 2 (annotated)

Figure 2 of Rabenko, reproduced above, shows a system block diagram of a residential gateway (Ex. 1005 ¶¶ 9, 50) comprising, among other things, DOCSIS 1.1 MAC with BPI+ 212 (annotated with Petitioner’s blue highlighting), core 228 (not annotated), and voice and data processor 213 (annotated with Petitioner’s red highlighting). Pet. 24.

As shown in Figure 2 of Rabenko, DOCSIS 1.1 MAC with BPI+ 212 (annotated with Petitioner’s blue highlighting), core 228 (not annotated), and voice and data processor 213 (annotated with Petitioner’s red highlighting) are connected together by internal system bus 218. Ex. 1005 ¶ 54, Fig. 2. Rabenko’s HomePNA controller 138 and AFE 226 are separate from the remaining residential gateway, including the components that Petitioner identifies as comprising the cable modem engine, that is DOCSIS 1.1 MAC with BPI+ 212, core 228, and voice and data processor 213. See Ex. 1005, Figs. 1b, 2.

We turn to Patent Owner’s argument that the components “must together constitute an ‘engine’” and Dr. Russ’s testimony in support of Patent Owner’s position. Prelim. Resp. 25; Ex. 2003 ¶ 69. The components of the cable modem engine include DOCSIS 1.1 MAC with BPI+ 212, which is a controller (Ex. 1005 ¶ 52), core 228, which comprises a CPU (*id.* ¶ 57), and voice and data processor 213. Pet. 24. A component of the data networking engine is Rabenko’s HomePNA controller 138. *Id.* These components are separate, as discussed above. We discuss Patent Owner’s arguments regarding partitioning with respect to limitation [18G].

At this preliminary stage, we find that the evidence of record supports Petitioner’s position. We find that Patent Owner’s arguments (Prelim. Resp. 19–32) and Dr. Russ’s testimony (Ex. 2003 ¶¶ 56–87) do not undermine Petitioner’s showing. Accordingly, we determine Petitioner has shown sufficiently for the purpose of institution that Rabenko teaches limitation [18C] of claim 18.

d) Element [18D]: “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”

For limitation [18D], Petitioner relies on (1) Rabenko alone; (2) the combined teachings of Rabenko and Gaspar; and (3) the combined teachings of Rabenko and Kim. Pet. 26–31. We address each of these alternatives in turn.

Regarding Rabenko alone, Petitioner states “Rabenko does not explicitly teach that any of DOCSIS MAC 134/212, proxy gateway 142, or voice/data processor 136/213 is configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the

HomePNA controller 138 and AFE 226.” Pet. 26. Petitioner argues its proposed modification to Rabenko “would have been obvious to try.” *Id.* at 27 (citing Ex. 1002 ¶¶ 122–123). Petitioner submits Dr. Kiaei’s testimony in support of its position. Ex. 1002 ¶¶ 121–123. “[B]ecause an *inter partes* review may only be requested ‘on the basis of prior art consisting of patents or printed publications,’ 35 U.S.C. § 311(b), expert testimony cannot take the place of disclosure from patents or printed publications.” See Consolidated Trial Practice Guide (“CTPG”)⁵ at 36; *see also* 84 Fed. Reg. 64,280 (Nov. 21, 2019). In light of our findings regarding the combined teachings of Rabenko and Kim, we decline to make further findings regarding Rabenko alone at this time in this proceeding.

Regarding the combined teachings of Rabenko and Gaspar (Pet. 28 (citing Ex. 1006 ¶ 14)), we note that Gaspar expressly discloses the following:

Generally, embodiments of the present invention enable convenient modifications to a controller circuit during and after the design process by partitioning a MAC circuit from a PHY circuit. By partitioning the MAC and PHY circuits, the MAC circuit can be implemented with a programmable device Such as an FPGA. As such, the controller circuit can be debugged or upgraded by modifying the MAC circuit, *leaving the PHY circuit intact*. This results in cost and time savings. FIG. 1 describes an embodiment of the present invention.

Ex. 1006 ¶ 14 (emphasis added).

Patent Owner argues “Gaspar merely teaches upgrading its HomePNA controller,” but “Gaspar does not contribute to the combination any teaching or suggestion of upgrading software for any components that the Petition

⁵ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

claims make up the CME.” Prelim. Resp. 45. We find that Gaspar teaches that partitioned components may be upgraded independently. Ex. 1006 ¶ 14 (explaining that “convenient modifications” are possible “by partitioning” and that “[b]y partitioning” the controller circuit “can be upgraded” by modifying one circuit, but not the other). Gaspar, however, teaches “modifying the MAC circuit,” but “leaving the PHY circuit intact.” *Id.* In light of our findings regarding the combined teachings of Rabenko and Kim discussed below, we decline to make further findings regarding the combined teachings of Rabenko and Gaspar at this point in this proceeding.

Regarding the combined teachings of Rabenko and Kim, Petitioner argues “Kim teaches that its residential gateway is ‘modular-type’ such that the HomePNA controller and the ADSL controller are partitioned and can be independently upgraded.” Pet. 28–31 (citing Ex. 1007 ¶¶ 2–8, 26, 32–42, Fig. 3; Ex. 1002 ¶¶ 129–133). Petitioner argues that a person of ordinary skill in the art would have made Petitioner’s proposed modification to Rabenko because the result would have been “less cost and inconvenience to the user” and would have allowed “the efficient updating of any of Rabenko’s partitioned components.” *Id.* at 30 (citing Ex. 1007 ¶ 5–7; Ex. 1002 ¶ 129).

Kim teaches a “modular type Home gateway system [that] provides the ADSL controller with ITU-T G.992.1 (G.dmt) function, and provides the HomePNA controller with 10 Mbps HomePNA 2.0 function.” Ex. 1007 ¶ 2, Fig. 1. Kim also teaches “a modular-type home gateway system for improving the performance of HomePNA controller or ADSL controller by maintaining the system controller of a home gateway and replacing either a

modular-type HomePNA controller or a modular-type ADSL controller, thereby improving the total performance of the home gateway.” *Id.* ¶ 8.

Patent Owner argues Kim does not have “anything to do with **upgrading software**,” but “Kim instead concerns replacing modular pieces of **hardware**.” Prelim. Resp. 48–49. Patent Owner also argues Petitioner has not shown a teaching of the “upgradeability of CME software” in Rabenko or Kim and “Rabenko’s embedded software is not shown to be upgradable at all.” *Id.* at 49. Patent Owner further argues that Petitioner has not shown “that Rabenko could be obviously and successfully modified to allow Kim’s hardware replacements” and that unlike Kim’s location of modular components “on the outer edges of the system to allow for easy replacement,” in Rabenko the CME components “are scattered.” *Id.* at 50–53 (citing, e.g., Ex. 1007 Fig. 3; Ex. 1005, ¶ 9, Fig. 2). Patent Owner submits the declaration testimony of Dr. Russ in support of its position. Ex. 2003 ¶¶ 91–131.

We start with Patent Owner’s first argument that Kim does not have “anything to do with **upgrading software**,” but “Kim instead concerns replacing modular pieces of **hardware**” and Dr. Russ’s testimony in support of Patent Owner’s position. Prelim. Resp. 48–49; Ex. 2003 ¶¶ 117–120. Claim 18 uses the term “comprising.” “Comprising” is a term of art used in claim language, which means that the named elements are essential, but other elements also may be included to constitute additional components within the scope of the claim. *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997). Thus, based on the preliminary record, we find that Kim teaches enabling “upgrades to its software” recited in limitation [18D] by replacing the controller to improve performance (Ex. 1007 ¶ 8),

because claim 18 does not exclude enabling upgrades to software by replacing the controller hardware.

We turn to Patent Owner’s second argument that Petitioner has not shown a teaching of the “upgradeability of CME software” in Rabenko or Kim and “Rabenko’s embedded software is not shown to be upgradable at all” and Dr. Russ’s testimony in support of Patent Owner’s position. Prelim. Resp. 49; Ex. 2003 ¶ 119. At this preliminary stage, we find that Patent Owner’s argument that Rabenko’s CME implementation including “embedded” software” would not have been understood by an ordinarily skilled artisan “to be disclosed to be upgradeable” (*id.* at 37–38) does not apply to upgrades in which accompanying hardware is replaced. In particular, Dr. Russ testifies as follows:

Such “embedded” software is generally rigid and fixed, incapable of being upgraded *without replacing or modifying the accompanying hardware*. *Id.*, 2 (“An embedded system is an integration of programmable software and hardware that may have fixed capabilities.”), 4 (“Because embedded system are sometimes related to certain hardware platforms, upgrading the system without changing the hardware can be difficult.”); Ex. 2004 [Monarch] 6 (“Once an embedded system is developed [y]ou are not able to alter, enhance or upgrade.”).

Ex. 2003 ¶ 98 (emphasis added).

We turn to Patent Owner’s argument that Petitioner has not shown “that Rabenko could be obviously and successfully modified to allow Kim’s hardware replacements” and that unlike Kim’s location of modular components “on the outer edges of the system to allow for easy replacement,” in Rabenko the CME components “are scattered.” *Id.* at 50–53 (citing, e.g., Ex. 1007 Fig. 3; Ex. 1005, ¶ 9, Fig. 2). We also consider Dr. Russ’s testimony submitted in support of Patent Owner’s position. Ex. 2003

¶¶ 123–131. Rabenko teaches that the DOCSIS MAC 212, core 228, voice and data processor 213, and HomePNA controller 138 are connected via internal system bus 218. Ex. 1005, Fig. 2. Rabenko describes a residential gateway (Ex. 1005 ¶ 34, Figs. 1b, 2) and Kim teaches “a home gateway system” (Ex. 1007 ¶ 26). We find that Petitioner’s identification of disclosures in the prior art and submission of expert testimony (Pet. 28–31; Ex. 1002 ¶¶ 120–133) is sufficient for purposes of institution.

At this preliminary stage, we find that the evidence of record supports Petitioner’s position that limitation [18D] is taught by the combined teachings of Rabenko and Kim and Petitioner has provided sufficient reasoning to combine those teachings. We find that Patent Owner’s arguments (Prelim. Resp. 32–56) and Dr. Russ’s testimony (Ex. 2003 ¶¶ 91–131) do not undermine Petitioner’s showing. Accordingly, we determine Petitioner has shown sufficiently for the purpose of institution that Rabenko and Kim teaches limitation [18D] of claim 18.

e) Limitation [18E]: “the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor”

Petitioner argues that “Rabenko discloses limitation [18E]” because “Rabenko’s cable modem engine includes voice and data processor 136/213 (‘DOCSIS controller’) and DOCSIS MAC 134/212 (‘DOCSIS MAC processor’),” and “[l]ike the ‘DOCSIS controller’ of the ’775 Patent, Rabenko’s voice and data processor 136/213 is used for processing and transporting voice over packet based networks.” Pet. 31 (citing Ex. 1005 ¶¶ 74, 85, 87; Ex. 1002 ¶¶ 134–139).

Patent Owner argues Petitioner has failed to meet its burden with respect to limitation [18E]. Prelim. Resp. 5–18. In particular, Patent Owner

argues that “DOCSIS” is a standard relating to cable television networks, and argues that Rabenko’s voice and data processor (relied on by Petitioner) is not a “DOCSIS Controller” because it “controls no DOCSIS functions.” *Id.* at 7–8. Patent Owner submits the testimony of Dr. Russ in support of its position. Ex. 2003 ¶¶ 40–52. As discussed above with respect to claim construction (§ III.C), Patent Owner’s dispute of Petitioner’s element-by-element analysis includes arguments relating to the ’775 patent Specification and the term “DOCSIS controller.” Prelim. Resp. 7–19. As discussed, at this stage, we decline to limit the claim term “DOCSIS controller” to a controller performing the specific functions identified by Patent Owner in the ’775 patent Specification. Prelim. Resp. 17 (citing Ex. 1001, 3:25–38). Instead, we use the ordinary and customary meaning of the term.

Petitioner argues that Rabenko’s voice and data processor 136/213 teaches the “DOCSIS controller” recited in limitation [18E]. Rabenko’s voice and data processor 136/213 is included in Rabenko’s residential gateway. *See, e.g.*, Ex. 1005, Figs. 1b, 2. Rabenko teaches “[i]n the exemplary residential gateway, a cable modem is used as described by the CableLabs DOCSIS specification.” *Id.* ¶ 34. Rabenko also teaches the “exemplary embodiment of the residential gateway” shown in Figure 2 provides “a highly integrated solution implemented in a single chip that is compliant with the Data Over Cable Service Interface Specification (DOCSIS),” which “was developed to ensure that cable modem equipment built by a variety of manufacturers is compatible.” *Id.* ¶ 50. Rabenko also teaches

a QPSK upstream modulator 202 is configured to transmit data to the cable head end, and a QAM downstream demodulator 200 is configured to receive data from the cable head end, and a

QPSK out of band downstream demodulator 206 is configured to receive out of band MPEG-2 encoded messages from the cable head end.”

Id. Figure 2 illustrates that QPSK upstream modulator 202 and QAM downstream demodulator 200 are connected to voice and data processor 213 via DSP/PB interface 268. *Id.* at Fig. 2. Additionally, Rabenko describes that voice and data processor “supports the exchange of voice, as well as facsimile and modem, between the POTS telephone 108 (see FIG.1a), or any number of telephony devices, and the cable head end.” *Id.* ¶ 74.

At this preliminary stage, we find that the evidence of record supports Petitioner’s position that limitation [18E] is taught by Rabenko. We find that Patent Owner’s arguments (Prelim. Resp.5–18) and Dr. Russ’s testimony (Ex. 2003 ¶¶ 40–52) do not undermine Petitioner’s showing. Accordingly, we determine Petitioner has shown sufficiently for the purpose of institution that Rabenko teaches limitation [18E] of claim 18.

f) *Limitation [18F]: “the 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 in order to boost downstream throughput”*

Petitioner argues that “Rabenko discloses limitation [18F]” because Rabenko discloses that “DOCSIS MAC 134/212 . . . translates the packet format for all arriving packets from DOCSIS to an internal format (‘configured to process downstream...packets’), and if a packet is a data packet, routes (‘forward the processed packets’) directly to (via the control flow line . . .) HomePNA controller 138 . . . (part of the claimed ‘data networking engine’).” Pet. 32 (citing Ex. 1005 ¶¶ 44, 45; Fig. 1b. Petitioner

argues that Rabenko’s Figure 1b “shows that voice/data processor 136/213 . . . (the claimed ‘DOCSIS controller’) is bypassed (‘without the involvement of the DOCSIS controller’) when a packet received by DOCSIS MAC 134/212 is a data packet.” Pet. 32–34 (citing Ex. 1005 ¶¶ 44–45, Fig. 1b; Ex. 1002 ¶¶ 140–148).

Patent Owner argues Petitioner has failed to meet its burden with respect to limitation [18F]. Prelim. Resp. 12–14. In particular, Patent Owner argues the Petition’s failure to show that Rabenko’s “voice and data processor” constitutes the claimed “DOCSIS controller” recited in limitation [18E] results in failure of proof with respect to limitation [18F]. *Id.* For the reasons given with respect to limitation [18E] (see § III.D.4.e), we find Petitioner’s showing for limitation [18E] is sufficient for the purpose of institution. For the same reasons, we find that Patent Owner’s argument does not undermine Petitioner’s showing for limitation [18F].

At this preliminary stage, we find that the evidence of record supports Petitioner’s position that limitation [18F] is taught by Rabenko. Accordingly, we determine Petitioner has shown sufficiently for the purpose of institution that Rabenko teaches limitation [18F] of claim 18.

g) Limitation [18G]: “a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine.”

Petitioner argues that “Rabenko discloses limitation [18G]” because (i) “Rabenko discloses an internal system bus 218 . . . that connects HomePNA controller 138 . . . (‘data networking engine’) to DOCSIS MAC 212 . . . (part of the ‘cable modem engine’),” and (ii) Rabenko’s Fig. 1b

shows “completely partitioned functions performed by the cable modem engine . . . and by HomePNA controller 138.” Pet. 35–38 (citing Ex. 1005 ¶¶ 44, 57, 60, Figs. 1b, 2; Ex. 1002, ¶¶149-159).

Patent Owner argues Petitioner has failed to meet its burden with respect to limitation [18G]. Prelim. Resp. 19–32. In particular, Patent Owner argues that “Rabenko simply lacks the partitioned architecture of the [’775] Patent.” *Id.* at 24. Patent Owner argues that the components Petitioner relies on for the cable modem engine are “functionally separated from one another.” *Id.* at 27. Patent Owner argues “there is no indication that the functions of the aforementioned components of the purported DNE and CME are even partitioned from one another.” *Id.* at 29. Patent Owner submits the testimony of Dr. Russ in support of its position. Ex. 2003 ¶¶ 72–87.

Rabenko teaches that the components identified as the cable modem engine, that is DOCSIS MAC 134/212, a proxy gateway 142, and voice/data processor 136/213 (Pet. 21) perform cable modem functions. Rabenko teaches that these components perform cable modem functions, such as those required for compliance with the DOCSIS specification. The cable modem engine components are “implemented in a single chip that is compliant” with the DOCSIS specification. Ex. 1005 ¶ 50. Also, Rabenko describes that “DOCSIS MAC 212 interfaces with a processor, such as a MIPS core 228” and that “[t]he MIPS core 228 controls the upstream modulator 202 and the downstream demodulator 200.” *Id.* ¶¶ 57, 58. Rabenko’s QPSK upstream modulator 202 is configured to transmit data to the cable head end, and Rabenko’s QAM downstream demodulator 200 is configured to receive data from the cable head end. *Id.* ¶ 50. As discussed

with respect to limitation [18E] (*see* § III.D.4.e), we find that Rabenko’s voice and data processor 136/213 teaches the “DOCSIS controller” recited in limitation [18E] and performs DOCSIS functions.

We find that Rabenko teaches “the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine.” As discussed with respect to limitation [18C] (*see* § III.D.4.c), we find that Rabenko teaches the physical separation recited in claim 18. At this preliminary stage, we find that Rabenko describes the “home networking functions” being performed by only the components identified as teaching the data networking engine.

By way of example, Rabenko teaches that “HomePNA controller 138” is “a fully integrated MAC/PHY device that provides bi-directional communication with devices such as for example a HomePNA phone, computer etc., operating on a HomePNA LAN via the subscriber port 106b of the residential gateway.” Ex. 1005 ¶ 80. Rabenko also teaches that “[t]he HomePNA controller 138 translates the data packet to a HomePNA packet and transmits the HomePNA packet to a media terminal adapter (MTA) 140 over the HomePNA LAN 110” and “[t]he MTA 140 represents any HomePNA device shown connected to the HomePNA LAN in FIG. 1a.” Ex. 1005 ¶ 45. Rabenko describes the “HomePNA (Home Phoneline Network Alliance)” protocol that delivers “telephony and services over the LAN 110 via the second subscriber port 106b, and is described in the Home PNA Specification Version 2.0.” *Id.* ¶ 34.

At this preliminary stage, we find that the evidence of record supports Petitioner’s position that limitation [18G] is taught by Rabenko. We find that

Patent Owner's arguments and Dr. Russ's testimony (Prelim. Resp. 19–32; Ex. 2003 ¶¶ 72–87) do not undermine Petitioner's showing. Accordingly, we determine Petitioner has shown sufficiently for the purpose of institution that Rabenko teaches limitation [18G] of claim 18.

h) Conclusion—Claim 18

After consideration of the arguments and the evidence of record at this early stage, we determine that Petitioner has shown sufficiently, for purposes of institution, that the combination of Rabenko and Kim (Ground C) teaches or suggests all recitations in claim 18. At this preliminary stage, we find that Petitioner has articulated sufficient reasoning with a rational underpinning as to why one of ordinary skill in the art would have made the proposed combinations in Ground C. We find that Patent Owner's arguments do not undermine Petitioner's showing at this early stage.

Accordingly, based on the record at this preliminary stage, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claim 18 is unpatentable under 35 U.S.C. § 103 as obvious over Rabenko and Kim (Ground C). Because Petitioner demonstrates a reasonable likelihood of success in proving that at least one claim of the '446 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See* 37 C.F.R. § 42.108(a).

5. Independent Claims 1 and 14

Petitioner presents contentions that independent claims 1 and 14 would have been obvious over Rabenko. Pet. 9, 41–48, 61–63. Patent Owner does not separately challenge Petitioner's analysis for these independent claims. Having reviewed Petitioner's arguments and evidence, we determine that Petitioner's showing that claims 1 and 14 would have

been obvious over the combination of Rabenko and Kim (Ground C) is supported by the cited evidence for the same reasons discussed with respect to independent claim 18.

Accordingly, based on the record at this preliminary stage, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 1 and 14 are unpatentable under 35 U.S.C. § 103 as obvious over Rabenko and Kim (Ground C). Because Petitioner demonstrates a reasonable likelihood of success in proving that at least one claim of the '446 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See* 37 C.F.R. § 42.108(a).

6. *Dependent Claims 2–7, 10, 12, 15, 19, and 20*

Petitioner asserts that claims 2–7, 10, 12, 15, 19, and 20 are unpatentable as obvious over (1) Rabenko (Ground A); (2) the combination of Rabenko and Gaspar (Ground B), the combination of Rabenko and Kim (Ground C), and the combination of Rabenko, Gaspar, and Kim (Ground D). Pet. 9. Claims 2–7, 10, and 12 depend from claim 1, either directly or indirectly. Claim 15 depends from claim 14. Claims 19, and 20 depend from claim 18. Petitioner provides a detailed analysis in support of its position that Rabenko teaches or suggests the limitations in dependent claims 2–7, 10, 15, 19, and 20. *See id.*

We have reviewed Petitioner's assertions and the evidence in support thereof. Patent Owner does not separately challenge Petitioner's analysis for the dependent claims. Based on the record at this preliminary stage, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claims 2–7, 10, 15, 19, and 20 are is

unpatentable under 35 U.S.C. § 103 as obvious over Rabenko and Kim (Ground C).

Regarding claim 12, Petitioner acknowledges “none of Rabenko, Gaspar, [or] Kim . . . specifically recite an ARM9TDMI-based or an ARM940-based RISC processor.” Pet. 56. At this stage, we question whether Petitioner has sufficiently demonstrated that the further recitation in claim 12 would have been an obvious design choice in view of the teachings of Rabenko, Gaspar, Kim, and Lu. *Id.* at 58. Because Petitioner demonstrates a reasonable likelihood of success in proving that at least one claim of the ’775 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See* 37 C.F.R. § 42.108(a).

E. Petitioner’s Remaining Challenges

Petitioner asserts that claims 1–7, 10, 12, 14, and 15 are unpatentable as obvious over each of grounds A through D in further view of Lu (referred to as Grounds E–H). Pet. 9. Petitioner further asserts that claim 12 is unpatentable as obvious over each of grounds A through H in further view of the combination of Klein and Kim (referred to as Grounds I–P). *Id.* at 9–10. Petitioner asserts that claim 8 is unpatentable as obvious over each of Grounds A–H in further view of Koperda (referred to as Grounds Q–X), claim 9 is unpatentable as obvious over each of Grounds Q–X in further view of Johnson (referred to as Grounds Y–FF), and claims 11, 13, 16, and 17 are unpatentable as obvious over each of Grounds A–H in further view of Johnson (referred to as Grounds GG–NN). Pet. 9–10.

Petitioner provides reasoning to combine Rabenko and Lu. Pet. 41–45. Petitioner also provides reasoning to combine Rabenko and Klein or Kim ’678. For claim 8, Petitioner provides reasoning to combine Rabenko

and Koperda. *Id.* at 65–69. For claims 9, 11, 13, 16, and 17, Petitioner provides reasoning to combine Rabenko and Johnson. *Id.* at 69–73. At this preliminary stage, we question whether Petitioner’s articulated reasoning sufficiently addresses Kim. We decline to make further findings at this stage. Because Petitioner demonstrates a reasonable likelihood of success in proving that at least one claim of the ’446 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See* 37 C.F.R. § 42.108(a).

F. Number of Grounds

Patent owner argues that the Petition should also be denied because its 40 asserted grounds are voluminous and excessive. Prelim. Resp. 7, 56–58 (citing *Adaptics Ltd. v. Perfect Company*, IPR2018-01596, Paper 20, 18 (Mar. 6, 2019) (informative) (“*Adaptics*”); *Uber Technologies, Inc. v. Surgetech LLC*, IPR2023-00738, Paper 8 (Oct. 23, 2023); *Energysource Minerals, LLC, v. Terralithium LLC*, IPR2019-01607, Paper 10, 13 (May 4, 2020) (similar)); *see also* Prelim. Resp. 4. In particular, Patent Owner argues the Petition asserts “at a minimum **40 separate grounds** (grounds ‘A’ through ‘NN’), involving eight separate references, challenging claims 1–20” and “[t]his ‘voluminous and excessive’ number of grounds is an independently sufficient reason to deny institution.” *Id.* (citing *Adaptics*, 18).

Petitioner challenges claims 1–20. Pet. 9. Fourteen claims, specifically claims 1–7, 10, 12, 14, 15, and 18–20, are challenged on the basis of four grounds, specifically Grounds A–D. *Id.* Petitioner relies on Lu for teaching a RISC processor recited in claims 1 and 14. *Id.* at 43–45. Petitioner submits one or two additional references for dependent claims 8, 9, 11–13, 16, and 17. *Id.* at 10. In view of the above, as well as the complexity of the

technology and detailed nature of certain of Petitioner's arguments, we decline to exercise discretion and deny institution on the basis of the number of grounds asserted.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail in proving the unpatentability of at least one of the challenged claims of the '775 patent. We thus institute an *inter partes* review of all of the challenged claims of the '775 patent on all grounds asserted in the Petition. *See* 37 C.F.R. § 42.108(a).

Any findings or conclusions in this Decision are made only for the purposes of institution and are not dispositive of any issue. We have not made a final determination with respect to the patentability of any challenged claim. Our final determination will be based on the record as fully developed during trial, including any evidence or argument timely presented by the parties under our Rules.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review of claims 1–20 of the '775 patent is hereby instituted on all grounds stated in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

IPR2024-00446
Patent 8,223,775 B2

For PETITIONER:

Frederic Meeker
Paul Qualey
John Fleming
Shambhavi Patel
Simon Lasker
BANNER & WITCOFF, LTD
fmeeker@bannerwitcoff.com
pqualey@bannerwitcoff.com
jfleming@bannerwitcoff.com
spatel@bannerwitcoff.com
slasker@bannerwitcoff.com

For PATENT OWNER:

Jason Engel
Erik Halverson
Matthew Blair
K&L GATES LLP
jason.engel.ptab@klgates.com
erik.halverson@klgates.com
matthew.blair@klgates.com

Kenneth Weatherwax
Parham Hendifar
LOWENSTEIN & WEATHERWAX LLP
weatherwax@lowensteinweatherwax.com,
hendifar@lowensteinweatherwax.com