

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Cox Communications, Inc.
Petitioner

v.

Entropic Communications, LLC.
Patent Owner

Inter Partes Review No.
IPR2024-00579

Patent No. 8,223,775
Filing Date: September 30, 2003
Issue Date: July 17, 2012

PETITION FOR *INTER PARTES* REVIEW

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 8,223,775
1002	Prosecution History of U.S. Patent No. 8,223,775
1003	Declaration of Dr. James Martin.
1004	Curriculum Vitae of Dr. James Martin.
1005	U.S. Patent Publication No. 2003/0161333 to Schain, et al.
1006	U.S. Patent Publication No. 2002/0061012 to Thi, et al.
1007	U.S. Patent Publication No. 2002/0091866 to Perlman
1008	U.S. Patent No. 7,769,046 to Crocker
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1010	<i>Entropic Communications, LLC v. Cox Communications, Inc.</i> , No. 2:23-cv-01049-JWH-KES (C.D. CA. Feb. 15, 2023) – Return of Service
1011	<i>Entropic Communications, LLC v. Charter Communications, Inc. et al</i> , No. 2-22-cv-00125 (E.D. TX. June, 26, 2023) – Markman Order
1012	<i>Entropic Communications, LLC v. Cox Communications, Inc.</i> , No. 2:23-cv-01049-JWH-KES (C.D. CA. Aug. 12, 2023) – Claim Construction Scheduling Order.
1013	Director Vidal Memorandum re: <i>Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation</i> , June 22, 2022

I. Introduction

Cox Communications, Inc. (“Petitioner”) hereby petitions for *inter partes* review (“IPR”) of claims 18 and 19 (“Challenged Claims”) of U.S. Patent No. 8,223,775 (“the ’775 Patent”), assigned to Entropic Communications, LLC (“Patent Owner”). A copy of the ’775 Patent and its prosecution history are attached as Exhibits 1001 and 1002.

The ’775 Patent describes and claims a “[a] cable modem system and architecture” and more specifically, a cable modem system in which “[a] cable modem engine performs all cable modem functions, and a data networking engine performs all data and home networking functions.” Ex. 1001, Abstract. Further, “[t]he cable modem engine is completely partitioned from the data networking engine.” *Id.*

Such cable modem systems with separate engines were well known in the art before the earliest possible priority date of the ’775 Patent. For example, U.S. Patent Publication No. 2003/0161333 to Schain, et al. describes “a broadband gateway 135 that combines a broadband modem 120 and a residential gateway 130 in a single unit.” Ex. 1005, Abstract; FIG. 1. Cable modem functionality is performed using a cable bridge and networking functionality is performed using a local bridge. *Id.*, ¶¶26, 46; Claim 1; FIG. 3. The two bridges are kept separate so that “the processing of external and local packets can be kept separate.” *Id.*, ¶51.

Similarly, U.S. Patent Publication No. 2002/0091866 to Perlman describes “a multimedia system capable of selecting between different network protocols for transmitting and receiving data and multimedia content” with a multimedia system that has “a selectable protocol module 230 which includes standard MPEG-2 logic 234 for processing multimedia cable/television channels and DOCSIS logic 235 for processing packetized data according to the DOCSIS Standard.” Ex. 1007, ¶23. As this Petition demonstrates, either of the Schain and Perlman references in combination with other references described in detail herein renders the Challenged Claims obvious.

The Board should institute review of claims 18 and 19 of the ’775 Patent.

II. IPR Requirements

A. Standing (37 C.F.R. § 42.104(a))

Petitioner certifies that the ’775 Patent is available for IPR and Petitioner is not barred or estopped from requesting IPR. The ’775 Patent issued on July 17, 2012; this Petition is filed within one year of service of the Complaint against Petitioner alleging infringement of the ’775 Patent (*see* Ex. 1010, Return of Service on Feb. 15, 2023) and is not barred under 35 U.S.C. § 315(b).

B. Challenge Under 37 C.F.R. § 42.104(b)

Pursuant to 35 U.S.C. § 311 and 37 C.F.R. § 42.104(b), this petition requests cancellation of claims 18 and 19 as obvious under 35 U.S.C. § 103 based on the following prior art references:

- U.S. Patent Publication No. 2003/0161333 to Schain, et al. (“Schain”);
- U.S. Patent Publication No. 2002/0061012 to Thi, et al. (“Thi”);
- U.S. Patent Publication No. 2002/0091866 to Perlman (“Perlman”);
- U.S. Patent No. 7,769,046 to Crocker (“Crocker”);
- U.S. Patent No. 7,225,240 to Fox, et al. (“Fox”).

The statutory grounds for the challenge of each claim are set forth below.

Ground	35 U.S.C. §	Claims	References
1	103	18 and 19	Schain in view of Thi
2	103	18 and 19	Perlman in view of Crocker and Fox

The record establishes a reasonable likelihood of prevailing as to each ground of invalidity with respect to the Challenged Claims.

III. Background

A. Priority Date and Family

The ’775 Patent was filed on September 30, 2003 and issued on July 17, 2012. Ex. 1001. Accordingly, the earliest possible effective filing date of the ’775 Patent

is September 30, 2003. The '775 patent is thus subject to pre-AIA 35 U.S.C. §§ 102 and 103.

B. The '775 Patent

The '775 Patent relates to “[a] cable modem system and architecture.” Ex. 1001, Abstract. More specifically, the '775 discloses a cable modem system in which “[a] cable modem engine performs all cable modem functions, and a data networking engine performs all data and home networking functions.” *Id.* Further, “[t]he cable modem engine is completely partitioned from the data networking engine.” *Id.*

“FIG. 1 illustrates a cable modem system architecture 100 according to the present invention.” Ex. 1001, 2:49-50.

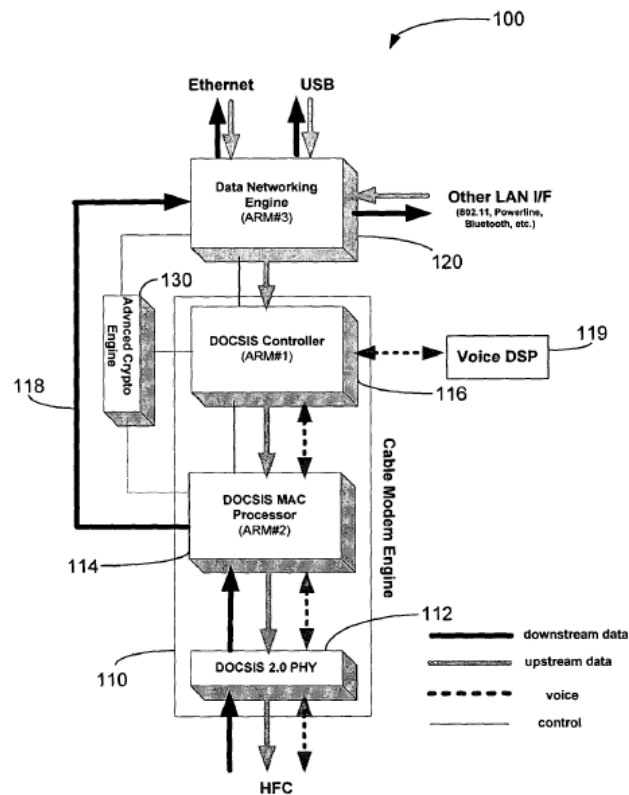


Figure 1

The inventors of the '775 patent do not claim to have invented any new cable modem or data networking services or electronic components. Ex. 1001, 1:13-16. Instead, the '775 Patent asserts that, "[t]he major challenge in designing such a gateway cable modem is integration of these [networking] services with the basic cable modem functionality in an efficient and cost-effective [sic, manner]." *Id.*, 1:16-18. The '775 Patent purports to address this with a "cable modem system having a functionally partitioned and flexible architecture." *Id.*, 1:7-9.

According to the background of the invention, “[p]artitioning [data networking] functions along with other cable modem functions among different computational agents is an essential issue in designing a gateway cable modem.” Ex. 1001, 1:20-29. Further, “[t]he data networking engine is partitioned from the cable modem engine so that the data and home networking functionality is completely decoupled from the DOCSIS and VoIP functionality.” *Id.*, 2:24-27. Such partitioning “is accomplished by localizing data networking functions in the data networking engine processor and localizing cable modem functions in the cable modem engine processor.” *Id.*, 4:13-19. “Since the data networking and cable modem functions are decoupled and implemented in different processors 110 and 120, independent software upgrading and maintenance of these functions is feasible.” 4:25-28. Moreover, “[a] chip implementing cable modem system 100 will have only a small incremental hardware cost/functional increase over current stand-alone cable modem chips.” *Id.*, 4:58-60.

“Existing cable modem software may be carried over to system 100 without major or drastic changes” and “[e]xisting software running on PCD network processors may be easily ported to run on data networking engine 120 without major adaptation.” Ex. 1001, 4:63-67

The ’775 Patent includes three independent and 17 dependent claims. Of those, this petition challenges two, claims 18 and 19. Claim 18 recites:

[pre] A cable modem system comprising:

[a] a data networking engine implemented in a first circuit that includes at least one processor,

[b] 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;

[c] a cable modem engine implemented in a second circuit that includes at least one processor,

[d] the second circuit being separate from the first circuit,

[e] 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,

[f] the cable modem functions including interfacing with cable media, and

[g] 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,

[h] the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor,

[i] 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

[j] a data bus that connects the data networking engine to the cable modem engine,

[k] 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.

Dependent claim 19 recites “A cable modem system as claimed in claim 18, wherein all DOCSIS functions are localized in the cable modem engine.”

C. Relevant Prosecution History of the '775 Patent

Over the course of examination, the Examiner repeatedly rejected the claims as anticipated by U.S. 2001/0039600 to Brooks (“Brooks ’600”). See, e.g., Ex. 1002, 92. In response, Applicant asserted:

The Examiner's apparent designation of the first processor 102 in Brooks ’600 as the “data networking engine,” and the second processor 104 and the CMAC/CPHY block (114, 118, 224 and 228) as the “cable modem engine,” further does not square with the claim 1 feature that “the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine,” and the claim 15 feature of “partitioning the data networking engine from the cable modem engine so that the data and home networking functionality is completely decoupled from the DOCSIS and VOiP functionality.” This is because the CMAC/CPHY block (114, 118, 224 and 228) communicates with both the processors 102 and 104 by sharing the

same data paths and sharing the same direct memory access controller.

Ex. 1002, 94. (Response to OA filed June 7, 2010).

In a subsequent Office Action, the Examiner relied on Schain to reject the independent claims, dropping reliance on Brooks without explanation. Ex. 1002, 65 (Office Action of Sept. 2, 2011). The Examiner indicated,

The following is a statement of reasons for the indication of allowable subject matter: 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.

Ex. 1002, 72 (Office action of Sept. 2, 2011). In response, Applicant incorporated this limitation into the independent claims, including newly-added claim 20, which issued as claim 18. *Id.*, 54 (Amend/Response filed Mar. 2, 2012).

IV. Expert Testimony, Level of Skill in the Art, and Claim Construction

A. Declaration Evidence

This petition is supported by the declaration of Dr. James Martin. Ex. 1003. Dr. Martin has worked extensively in the field of electrical engineering and computer science with a focus on telecommunications. Ex. 1004. He has studied telecommunications and systems engineering since approximately 1980. *Id.* Dr. Martin has over 20 years of industry experience in telecommunications, including

with DOCSIS Cable HFC access networks, systems and services. *Id.* Further, he has extensive experience in the cable industry, with a deep understanding of network traffic and the DOCSIS standard, having contributed to the DOCSIS 3.0/3.1 CableLabs standards as well as the IEEE 802.16 WiMAX standards. *Id.*

B. Level of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) of the ’775 Patent would have had at least i) a bachelor-level degree in electrical engineering or an equivalent subject and three or more years of experience working in the field of cable and/or satellite signal processing and communication systems; ii) a master’s-level degree in electrical engineering or an equivalent subject and one or more years of experience working in the field of cable and/or satellite television signal processing and communication systems; or iii) a Ph.D.-level degree in electrical engineering or an equivalent subject and at least some experience working in the field of cable and/or satellite television signal processing and/or communication systems. Ex. 1003, ¶20. Dr. Martin was at least one of skill in the art at the time of the alleged invention.

C. Claim Construction

The claim terms of the ’775 Patent are construed under the *Phillips* standard, considering the plain meaning of the claim terms to a person of ordinary skill in the

art, in light of the intrinsic record.¹

Petitioner notes that at least one district court, in a case that settled without appeal, construed certain of the claim terms of the '775 patent. See Ex. 1011. The court adopted ordinary meaning for all terms except the “wherein” clause appearing in claim 18. The court’s construction of the wherein clause, however, does not help clarify the meaning of the claim term and thus construction in this proceeding is not necessary. The court “expressly rejects Defendant’s proposal that the cable modem engine and the data networking engine cannot share any connecting circuitry, data paths, or memory devices.” Ex. 1011, p. 17. Accordingly, Petitioner contends that, as to the “wherein” clause of claim 18, the ordinary meaning applies. Finally, none of the remaining claim terms of the '775 Patent need be construed by the Board. *See* Ex. 1003, ¶18.

V. Prior Art

A. U.S. Patent Publication No. 2003/0161333 to Schain, et al. (Ex. 1005)

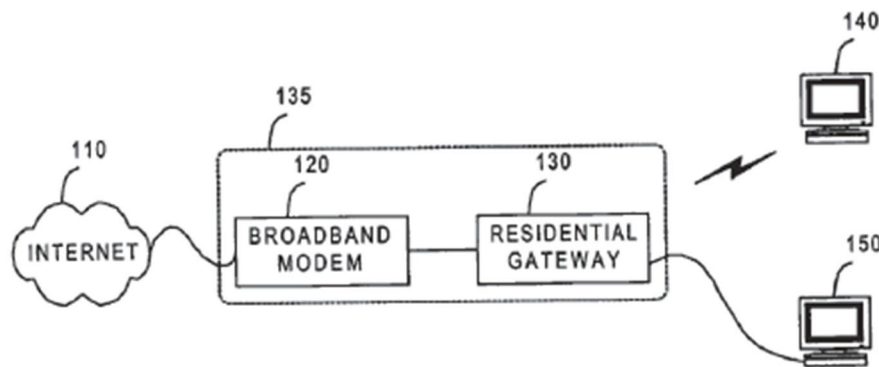
Schain, entitled “Broadband Modem Residential Gateway with Efficient

¹ Petitioner is not conceding that each claim satisfies all statutory requirements, such as §§ 101 and 112, nor is Petitioner waiving any arguments concerning claim scope or grounds that can only be raised in district court.

Network Traffic Processing,” was filed on August 2, 2002, claiming priority to Provisional application No. 60/358,794, filed on Feb. 22, 2002. Ex. 1005. Schain published on August 28, 2003. *Id.* Schain is thus prior art to the ’775 Patent under at least pre-AIA 35 U.S.C. § 102(a) and (e).

Schain is from the same field of endeavor as the ’775 Patent, as both relate to cable modem systems. Ex. 1003, ¶22. Thus, Schain is analogous art to the ’775 Patent. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)

Schain describes “a broadband gateway 135 that combines a broadband modem 120 and a residential gateway 130 in a single unit.” Ex. 1005, Abstract; FIG. 1 (*below*).



Cable modem functionality is performed using a cable bridge and networking functionality is performed using a local bridge. Ex. 1005, ¶¶26, 46; Claim 1; FIG. 3 (*below*). The two bridges are kept separate so that “the processing of external and local packets can be kept separate.” *Id.*, ¶51.

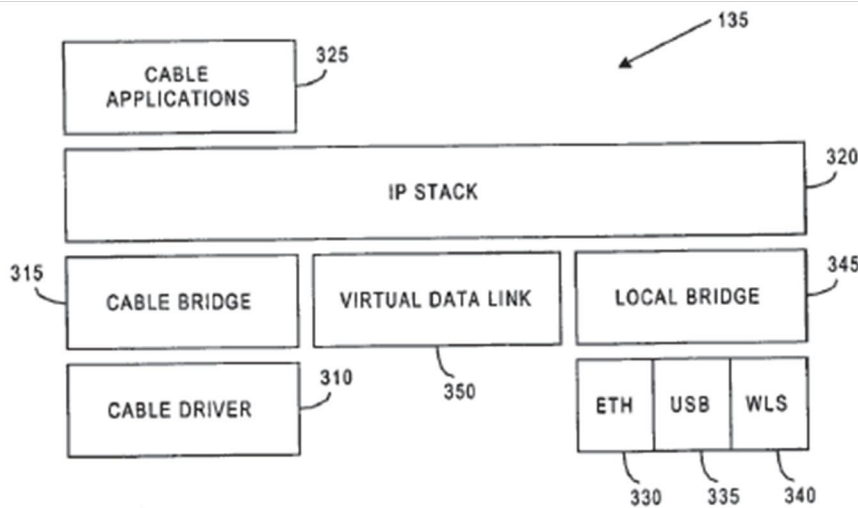


Figure 3

“The cable bridge 315 is responsible for processing external packets received at the cable modem and also provides DOCSIS specified filtering of the external packets.” Ex. 1005, ¶46. “The local bridge 345, on the other hand, provides address filtering, general filtering, and translating for local packets and packets crossing the interface.” *Id.*

[A] change made to one module does not necessarily affect another module, since each are designed to operate independently of one another. This allows the continued fine-tuning of the modules without affecting the other modules in a negative way.

Ex. 1005, ¶51.

B. U.S. Patent Publication No. 2002/0061012 to Thi, et al. (Ex. 1006)

Thi, entitled, “Cable Modem with Voice Processing Capability,” was filed as a continuation-in-part application on September 12, 2001, published on May 23, 2002, and is thus prior art under at least pre-AIA 35 U.S.C. §§ 102(a), (b), and (e).

Thi is from the same field of endeavor as the '775 Patent, as both relate to cable modem systems. Ex. 1003, ¶26. Thus, Thi is analogous art to the '775 Patent. *Bigio*, 381 F.3d at 1325, *supra*.

Thi describes a “network gateway [that] is configured to facilitate on line and off line bi-directional communication . . . via a hybrid fiber coaxial network and a cable modem termination system.” Ex. 1006, Abstract.

The network gateway includes a DOCSIS MAC. Ex. 1006, ¶169; FIG. 7. “The extracted MAC frames are passed to a MAC header processing block in a message processor 282.” *Id.* “The MAC header processor routes all PDUs matching the network gateway extended header type to the downstream DES 284 for decryption.” *Id.*, ¶170.

Thi’s system also includes “voice and data processor 160” which “supports the exchange of voice, as well as fax and modem, between a traditional circuit switched network or any number of telephony devices and the CMTS (not shown). The voice and data processor 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.” Ex. 1006, ¶147.

Thi is also designed to mitigate path latency: “[w]ith regard to path latency and the jitter in that latency, it is not desirable to have packets assembled on one end of the network and leisurely delivered at the other end.” Ex. 1006, ¶246.

C. U.S. Patent Publication No. 2002/0091866 to Perlman (Ex. 1007)

Perlman is entitled “Selectable Mode Multimedia System,” was filed on January 5, 2001, and was published on June 11, 2002. Perlman is thus prior art to the ’775 Patent under at least pre-AIA 35 U.S.C. § 102(a), (b), and (e).

Perlman is from the same field of endeavor as the ’775 Patent, as both relate to cable modem systems. Ex. 1003, ¶29. Thus, Perlman is analogous art to the ’775 Patent. *Bigio*, 381 F.3d at 1325, *supra*.

Perlman describes “a multimedia system capable of selecting between different network protocols for transmitting and receiving data and multimedia content.” Ex. 1007, ¶ 2. The multimedia system has “a selectable protocol module 230 which includes standard MPEG-2 logic 234 for processing multimedia cable/television channels and DOCSIS logic 235 for processing packetized data according to the DOCSIS Standard.” *Id.*, ¶ 23.

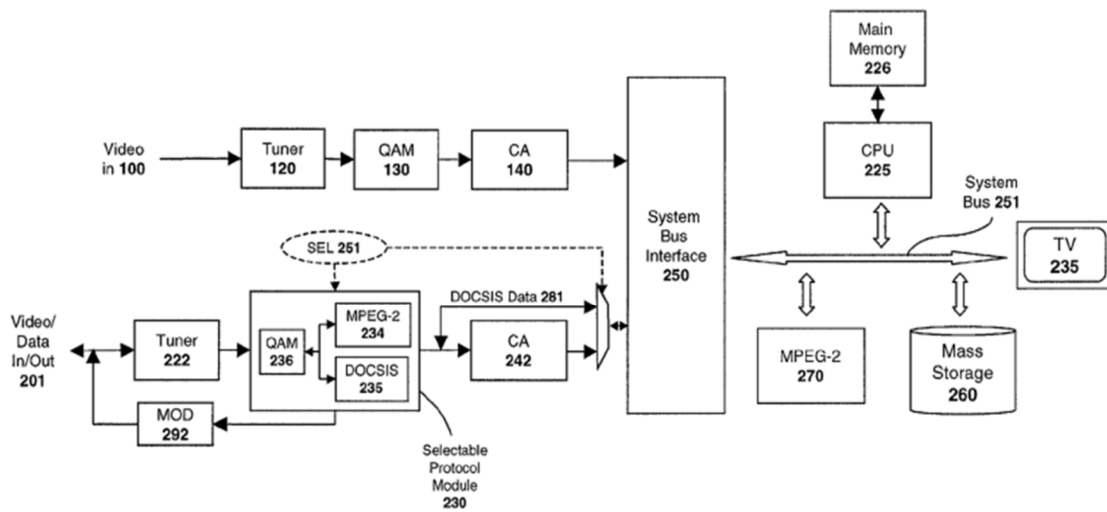


FIG. 2a

Ex. 1007, FIG. 2a.

D. U.S. Patent No. 7,769,046 to Crocker (Ex. 1008)

Crocker was filed on January 31, 2007 as a continuation of application 10/128,005, filed April 22, 2002, which claims the benefit of provisional application 60/297,591 filed June 11, 2001. Crocker issued on August 3, 2010. Ex. 1008. Ex. 1008. Crocker is thus prior art to the '775 Patent under at least pre-AIA 35 U.S.C. § 102(e).

Crocker is from the same field of endeavor as the '775 Patent, as both relate to systems for networking including cable modem functionality. Ex. 1003, ¶30. Thus, Crocker is analogous art to the '775 Patent. *Bigio*, 381 F.3d at 1325, *supra*.

Crocker describes a Cable Modem Termination System (CMTS). A “plurality of nodes represents a plurality of cable modems that communicate with

at least one CMTS . . . using at least one shared access upstream and downstream channel. Ex. 1008, 21:25-29.

FIG. 7 of Crocker shows a CMTS 700 which includes line cards 735 including “an interface component between external data sources and the cable system” and line cards 731 that “correspond to radio-frequency (RF) line cards which have been configured or designed for use in a cable network.” Ex. 1008, 13:52-53, 15:46-55, FIG. 7 (*below*).

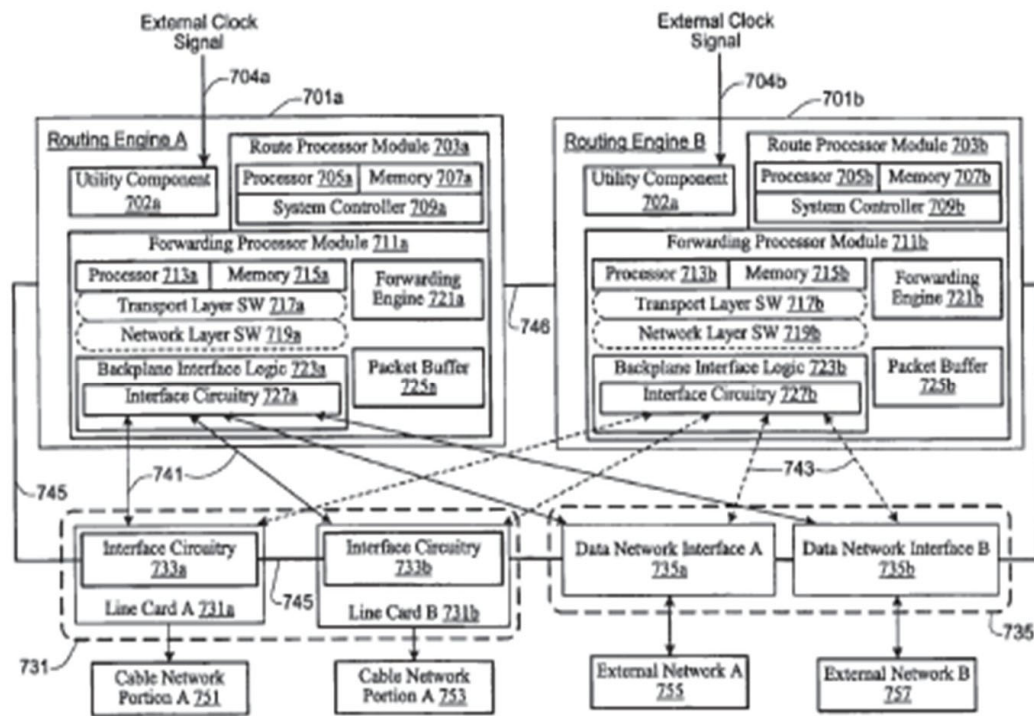


Figure 7 700

A line card such as the line card 231 is shown in FIG. 8. The line card includes a “MAC layer 830 [which] includes a MAC hardware portion 834 and a

MAC software portion 884. The MAC layer software portion may include software relating to DOCSIS MAC functionality, etc.” Ex. 1008, 18:29-32; FIG. 8 (*below*).

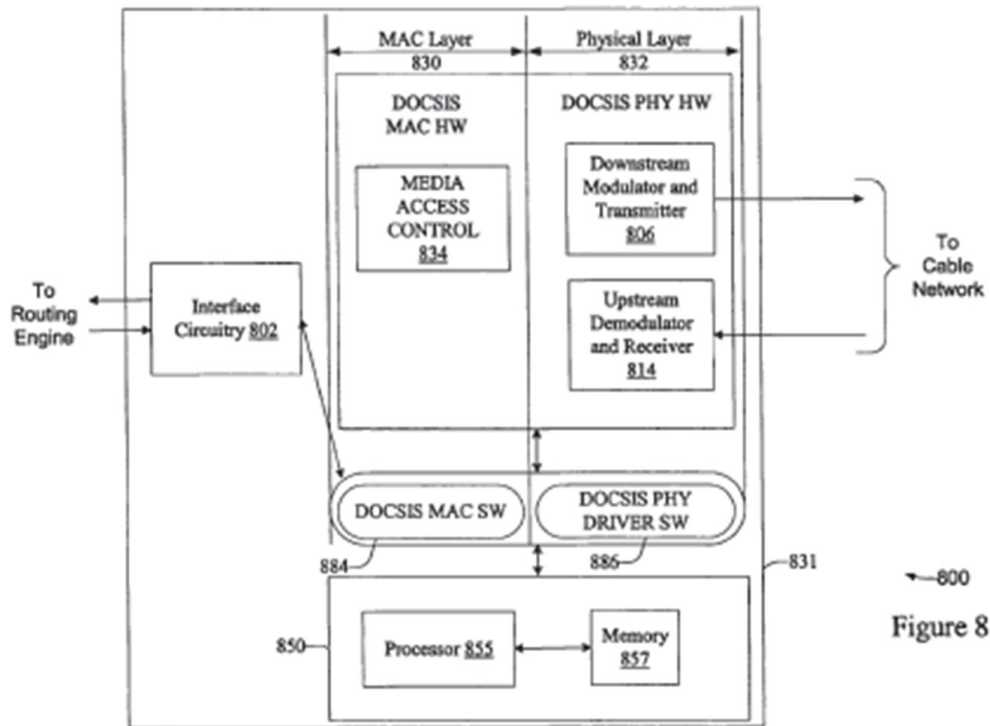


Figure 8

E. U.S. Patent No. 7,225,240 to Fox, et al. (Ex. 1009)

Fox, entitled, “Decoupling Processes from Hardware with Logical Identifiers,” was filed on May 20, 2000, issued on May 29, 2007, and is thus prior art under at least pre-AIA 35 U.S.C. § 102(e).

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. *Bigio*, 381 F.3d at 1325, *supra*.

Fox describes “methods and apparatus for decoupling functional processes, such as network protocol applications and device drivers, from hardware resources through the use of logical resources. Ex. 1009, Abstract.

In Fox, a “modular software architecture solves some of the more common scenarios seen in existing architectures when software is upgraded or new features are deployed. Ex. 1009, 4:34-36. “[S]oftware applications may be upgraded and downgraded independent of each other and without having to reboot the computer system.” *Id.*, Claim 1.

F. One of Skill in the Art Would have Been Motivated to Combine the Prior Art.

1. Motivation to Combine Schain and Thi and the Reasonable Expectation of Success:

One of skill in the art would have been motivated to combine the cable modem functionality described in Schain and Thi. *First*, Schain and Thi both relate to cable modems with DOCSIS functionality. Ex. 1005, ¶25; Ex. 1006, ¶388; Ex. 1003, ¶36. Thus, Schain and Thi are in the same field, and describe systems with which one of skill in the art would be familiar. *Id.*.

Second, Shain and Thi recognize the need to accommodate new and upgraded applications and technology in cable networking and networking in general. Ex. 1003, ¶37. For example, Schain states that it is an object to “reduce[] interaction and interference between local and external packet processing.” Ex.

1005, ¶7; Ex. 1003, ¶38. Thi recognizes a specific latency problem with VoIP traffic, highlighting the need to avoid “excessive path latency.” Ex. 1006, ¶242; Ex. 1003, ¶38.

Because Schain and Thi identify the same or similar types of problems, share the same goals, such as limiting latency, are in the same field, and would have been known by the same people or people having similar technical backgrounds, including a POSITA in this proceeding, a POSITA would be motivated to modify the cable modem of Schain to forward packets without the involvement of the DOCSIS controller as described in Thi to ensure efficiency and avoid issues such as jitter. Ex. 1003, ¶39.

A POSITA would have had a reasonable expectation of success in making such modifications, since Schain and Thi describe using hardware and software that was conventional at the time of the alleged invention and known by a POSITA. Ex. 1003, ¶40. The relatively high level of skill in the art, coupled with the skilled artisan's familiarity and experience with ensuring the network's ability to flexibly and efficiently transmit data – including forwarding of downstream PDU packets – and to ensure interoperability likewise meant a skilled artisan would have a reasonable expectation of success in so modifying Schain. Ex. 1003, ¶41.

2. Motivation to Combine Perlman with Crocker and Fox and the Reasonable Expectation of Success:

One of skill in the art would also have been motivated to combine the cable modem systems described in Perlman and Crocker and the independent software upgrades described in Fox. Ex. 1003, ¶41. *First*, Perlman, Crocker, and Fox all relate to systems and methods for networking. Ex. 1007, Abstract; Ex. 1008, Abstract; Ex. 1009, Abstract; Ex. 1003, ¶43. Further, Perlman and Crocker both involve transmitting and receiving data in cable networks using the same communications standards. *See, e.g.* Ex. 1007, ¶11; Ex. 1008, 2:28-48. Thus, Perlman and Crocker are in the same field, and describe systems with which one of skill in the art would be familiar. Ex. 1003, ¶44. A POSITA designing a cable modem would be well aware of CMTS technology and protocols, and a POSITA designing a CMTS would similarly be well aware of cable modem technology. *Id.*

Second, Perlman, Crocker, and Fox all recognize the need to accommodate new and upgraded applications and technology in the cable networking space and in networking in general. For example, Perlman states that in previous systems, “new transmission techniques/protocols which would allow cable providers to transmit content in a more flexible, efficient and intelligent manner may not be employed” so “what is needed is a system and method for receiving and transmitting data and multimedia content over a cable network in a more flexible,

efficient and intelligent manner.” Ex. 1007, ¶¶10-11. Crocker also notes that “it is also 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, 3:42-45. Relatedly, Fox notes, “[s]ervice providers not only incur downtime due to failures, but also incur downtime for upgrades to deploy new or improved software, hardware, software or hardware fixes or patches that are needed to deal with current network problems” and that the “majority of Internet outages are directly attributable to software upgrade issues.” Ex. 1009, 1:6-7.

Fox and Crocker thus identify the same problem as Perlman, the need to accommodate new applications and technology for a more efficient and flexible system. Ex. 1003, ¶¶47-49. Collectively, the art motivated skilled artisans to allow for flexible data transmission and receipt, to ensure components would interoperate within a heterogenous and complex network environment, and to allow for relatively frequent software and hardware upgrades and fixes that could be performed in a manner that minimized downtimes while optimizing flexibility. *Id.*

Because Perlman and Crocker have the same goals, and because the systems and concepts described in Perlman and Crocker are in the same field and would have been known by those having similar technical backgrounds, including a POSITA in this proceeding, a POSITA would have been motivated to modify the

multimedia apparatus of Perlman to include the functionality of the CMTS in Crocker to help provide the “more flexible, efficient and intelligent” system that Perlman seeks. *Id.*

A POSITA would also have been motivated to apply the teachings of Fox to help provide a more efficient system as sought by Perlman. Fox describes that it is advantageous to allow “software applications [to] be upgraded and downgraded independent from each other,” in order to mitigate the issues recognized by Perlman, Crocker, and Fox. Ex. 1009, 8:43-56; Ex. 1003, ¶¶49-50. A POSITA would have thus been motivated to modify the cable modem systems of Perlman and Crocker to include independent software upgrades as described in Fox to allow one engine to execute seamlessly while the other engine is being upgraded. Ex. 1003, ¶51.

Perlman, Crocker, and Fox describe using hardware and software that was conventional at the time of the alleged invention and thus known by a POSITA in this proceeding, and a POSITA would expect to have been successful in modifying Perlman based on the teachings of Crocker and of Fox. Ex. 1003, ¶52. The relatively high level of skill in the art, coupled with the skilled artisan's familiarity and experience with ensuring the network's ability to flexibly and efficiently transmit data, to update the corresponding software , and to ensure interoperability

likewise meant a skilled artisan would have a reasonable expectation of success in so modifying Perlman. Ex. 1003, ¶52.

VI. Full Statement of the Reasons for the Relief Requested

A. Ground 1: Claims 18 and 19 are unpatentable as obvious over Schain in view of Thi

The combination of Schain and Thi discloses a broadband gateway that includes a local bridge for performing data networking functions and a cable bridge for performing cable modem functions and renders claims 18 and 19 obvious.

As noted above, the Examiner raised Schain in prosecution. In response, the Patent Owner made no argument that Schain did not teach the features of the independent claims, instead amending to overcome Schain without argument. Thus, estoppel should apply as to the features noted by the examiner as disclosed in Schain. The facts are similar to those in *Google LLC v. Parus Holdings, Inc.*, IPR2022-00279, Paper 16 (P.T.A.B. Sept. 18, 2023) (*holding* collateral estoppel applied at institution based on a patent owner's failure to argue that an element was missing in a prior art reference in a prior IPR) and *Electa Ltd. v. Zap Surgical Sys., Inc.*, IPR2021-01985, Paper 64 (P.T.A.B. Sept. 21, 2023) (*holding* the patent owner's failure to distinguish prior art during prosecution could be evidence that the prior art did not teach away from the proposed combination of references).

Regardless, Schain teaches all of the limitations on which the Examiner's rejection relied.

1. Independent claim 18

a. *Claim 1 Preamble – A cable modem system comprising:*²:

Schain discloses the preamble, stating “[t]he following discussion focuses on a basic architecture of a broadband gateway for a DOCSIS 1.0 and 1.1 compliant cable modem/residential gateway device.” Ex. 1005, ¶25; Ex. 1003, ¶¶54-57. The broadband gateway is a cable modem system. Ex. 1003, ¶57. Schain explains, “the present invention provides a circuit comprising a broadband modem coupled to a broadband medium.” Ex. 1005, ¶8; Ex. 1003, ¶55.

b. *Claim 18a – a data networking engine implemented in a first circuit that includes at least one processor; and*

Schain discloses element 18a, including a “local bridge 345” that performs data networking functions: “The local bridge 345 . . . provides address filtering, general filtering, and translating for local packets and packets crossing the

² Petitioner does not take a position as to whether the preamble is limiting.

However, if the Board finds it is limiting, the prior art of either of the two grounds, 1 and 2, discloses it.

interface.” Ex. 1005, ¶46, FIG. 3; Ex. 1003, ¶¶58-59, 63. “Beneath each bridge is a separate driver layer, with the cable modem featuring a cable driver 310 and the residential gateway [local bridge 345] various drivers, such as an Ethernet driver 330, an USB driver 335, and a wireless driver 340.” Ex. 1003, ¶46.

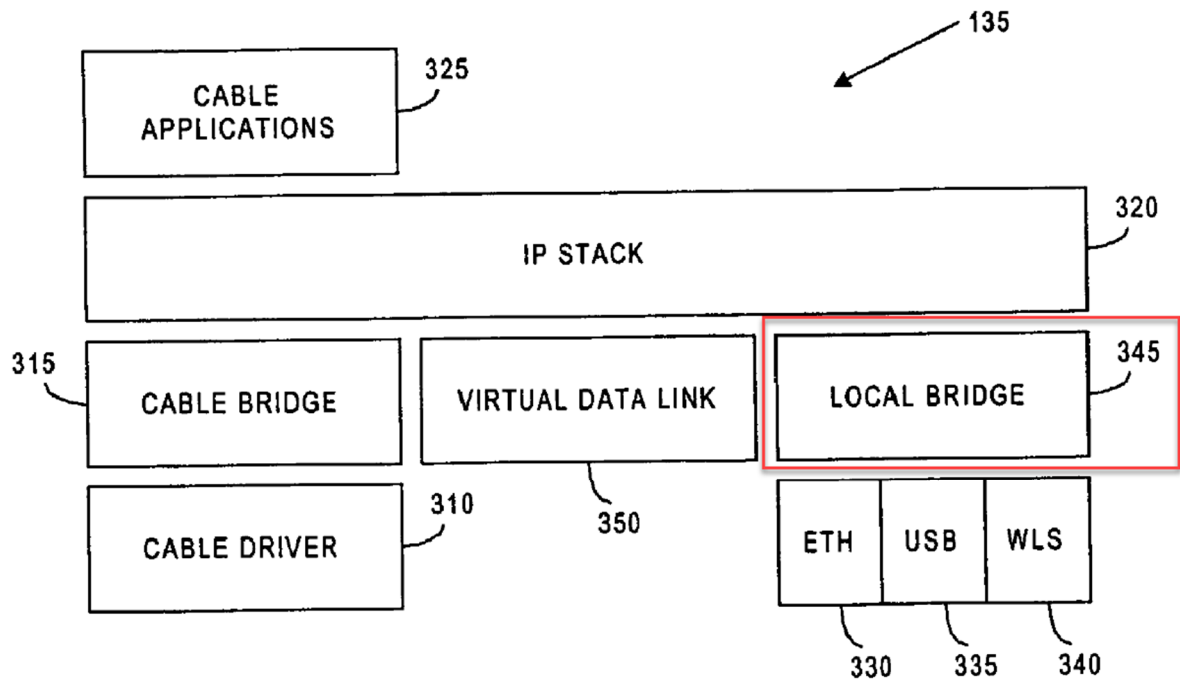


Figure 3

The local bridge is implemented in a circuit: “A circuit comprising . . . a local bridge.” Ex. 1005, claim 1; Ex. 1003, ¶61. Shain also discloses a processor: “[c]onnected to the common bus 515 is a central processing unit (CPU) 520,” i.e., a processor. Ex. 1005, ¶61, FIG. 5; Ex. 1003, ¶62.

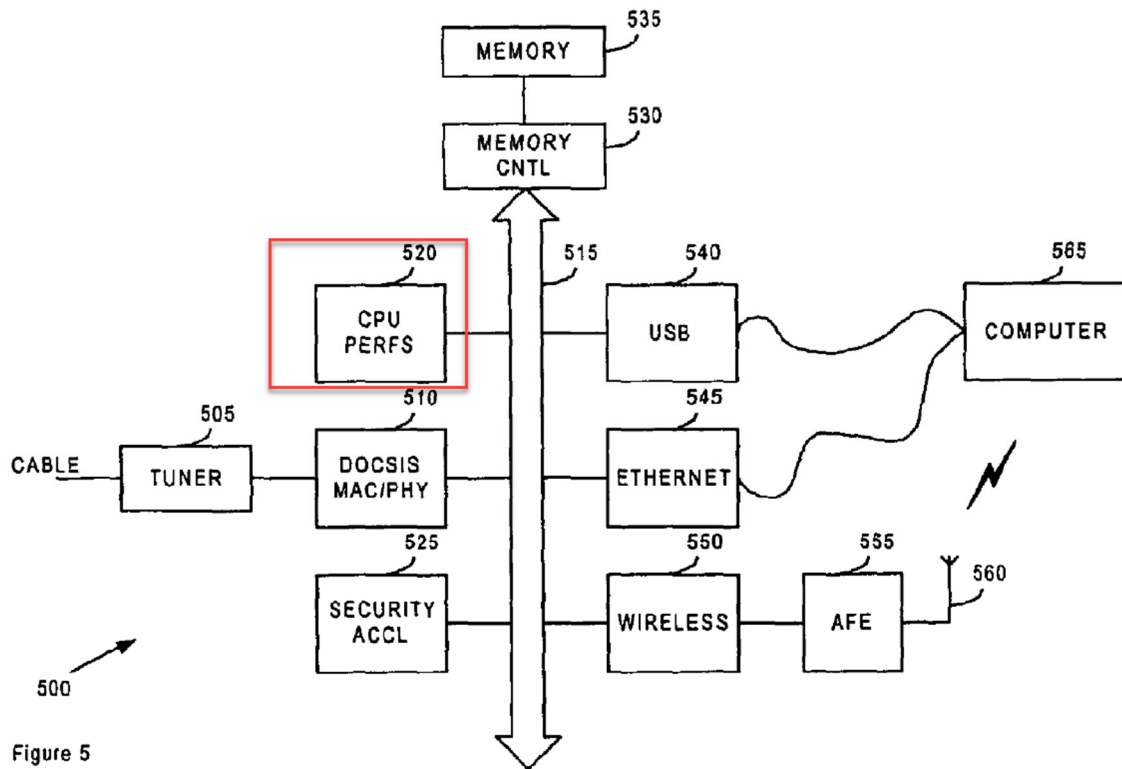


Figure 5

“The CPU 520 is responsible for performing any decoding, high-level error detection and correction, high-level signaling, IP packet processing, address translation, etc.” Ex. 1005, ¶61, FIG. 5; Ex. 1003, ¶62.

- c. ***Claim 18b – 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;***

Schain discloses element 18b, describing various home networking functions performed by the local bridge of Schain: “a local bridge coupled to a

network connection, the local bridge containing circuitry to filter packets.” Ex. 1005, claim 1; Ex. 1003, ¶¶64-68.

The home networking functions include interfacing with a subscriber’s computer equipment 140 and 150,” i.e., subscriber or customer provided equipment:

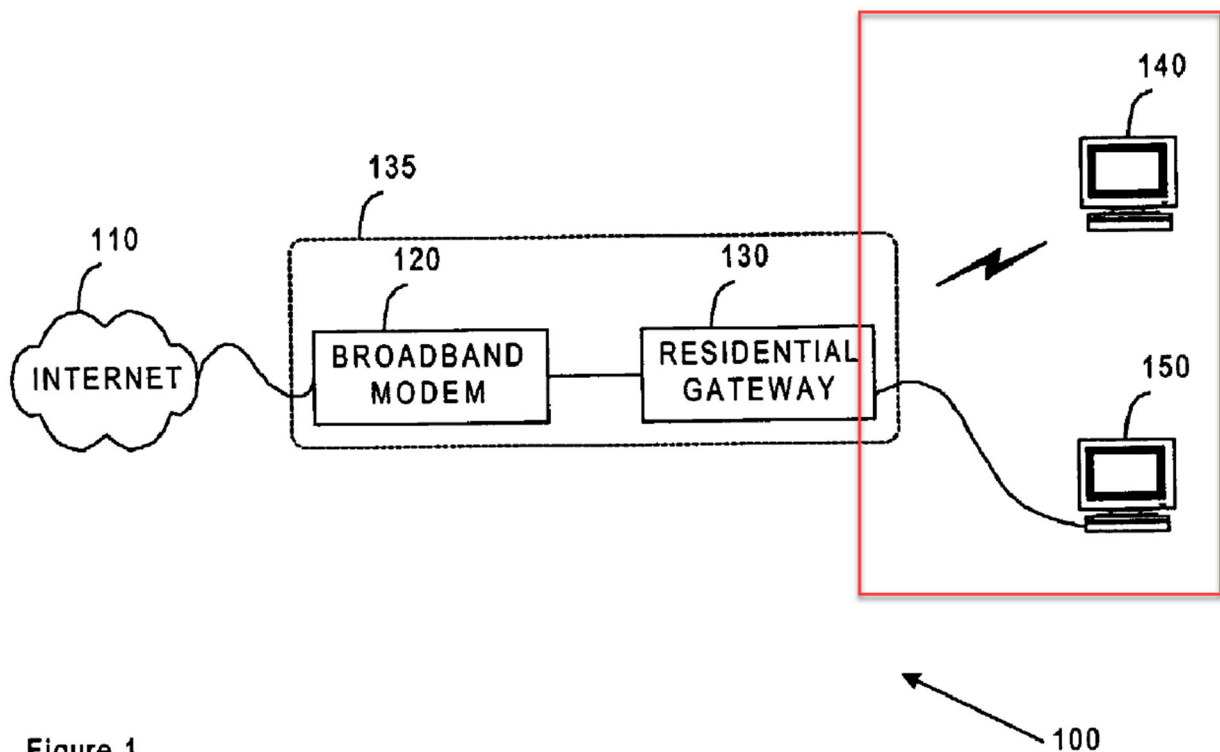


Figure 1

Referring now to FIG. 1, a diagram illustrates a typical installation of a Subscriber's computer equipment 140 and 150 with a broadband modem 120 and a residential gateway 130, connecting the computer equipment to a network 110, such as the Internet. . . Also note that while the subscriber's equipment is displayed as personal computers, other digital devices may also

attach to the data network. Examples of such equipment may include personal data assistants, multi-media players, televisions, etc.

Ex. 1005, ¶26, FIG. 1; Ex. 1003, ¶¶65-66.

Schain also discloses a “software portion of the driver layer being programs that makes the hardware portion operable.” Ex. 1005, ¶31. Schain therefore describes software that makes the local bridge operable to function, where the functions of the local bridge include home networking functions including interfacing with customer equipment. Ex. 1003, ¶67.

d. *Claim 18c – a cable modem engine implemented in a second circuit that includes at least one processor,*

Schain discloses element 18c. Ex. 1003, ¶¶69-74. According to the ‘775 Patent, a cable modem engine “implements . . . DOCSIS cable modem functionality” such as “receiv[ing] downstream data [and] transmit[ting] upstream data.” Ex. 1001, 2:55-63.

Schain discloses a “cable bridge 315 [that] is responsible for processing external packets received at the cable modem.” Ex. 1005, ¶46; Ex. 1003, ¶69. 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. Also, per Schain, the cable modem engine includes a “DOCSIS compliant cable modem,” such as a “DOCSIS 1.0 and 1.1 compliant

cable modem/residential gateway device.” Ex. 1005, ¶25; Ex. 1003, ¶70. Schain’s cable modem engine includes a “DOCSIS MAC/PHY processor 510.” Ex. 1005, ¶60; Ex. 1003, ¶73. At the DOCSIS MAC/PHY processor, “the information stream . . . is converted into a standardized data format . . . that can be used by devices connected to the broadband gateway.” Ex. 1005, ¶60; Ex. 1003, ¶73.

e. Claim 18d – *the second circuit being separate from the first circuit,*

Schain discloses element 18d, describing the local bridge and the cable bridge as being separate: “By keeping the two bridges separate, the processing of external and local packets can be kept separate.” Ex. 1005, ¶51; Ex. 1003, ¶¶75-77. “Beneath each bridge is a separate driver layer, with the cable modem featuring a cable driver 310 and the residential gateway various drivers, such as an Ethernet driver 330, an USB driver 335, and a wireless driver 340.” Ex. 1005, ¶46; Ex. 1003, ¶76. The local bridge 345 and the cable bridge 315 are shown as separate:

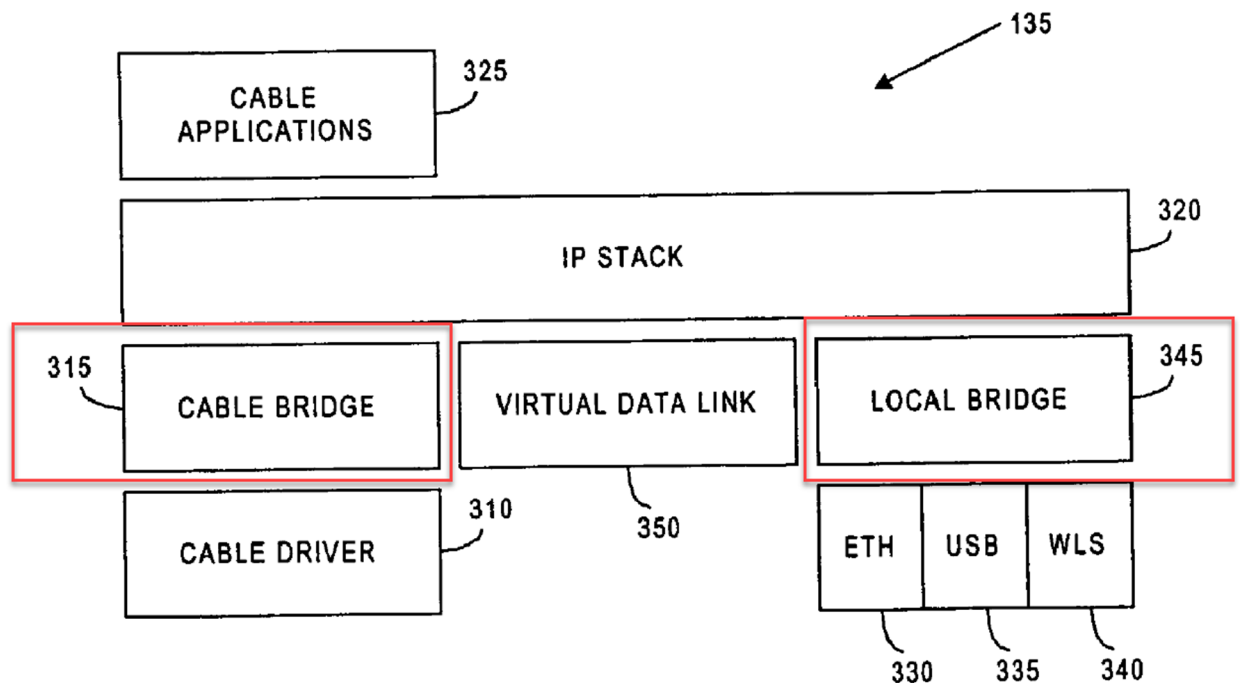


Figure 3

Ex. 1005, Figure 3 (annotated); Ex. 1003, ¶75.

- a. ***Claim 18e – 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,***

Schain discloses element 18e, noting that the “cable bridge 315 is responsible for processing external packets received at the cable modem and also provides DOCSIS specified filtering of the external packets. The local bridge 345, ***on the other hand***, provides address filtering, general filtering, and translating for local packets and packets crossing the interface.” Ex. 1005, ¶46 (emphasis added); Ex. 1003, ¶78-80.

The cable bridge is programmed with software that causes the cable bridge to perform these cable modem functions: “the software architecture displays its shared IP stack 420 as being partitioned into two parts. The first IP stack module 422 is present in the external group 405 and is used to provide typical IP stack functionality for the broadband modem portion of the broadband gateway.” Ex. 1005, ¶55, FIG. 4; Ex. 1003, ¶79.

b. *Claim 18f – the cable modem functions including interfacing with cable media, and*

Schain discloses element 18f, noting that the

broadband gateway 135 ha[s] two portions, a broadband modem portion and a residential gateway portion, for the specific case of coaxial cabling being the broadband medium. However, modifications to (or simple replacement of) the cable modem portion of the broadband gateway 135 will permit use of the present invention with other broadband media.

Ex. 1005, ¶37, FIG. 4; Ex. 1003, ¶¶81-83. A person skilled in the art would have understood “cable media” to include physical media such as coaxial cabling or the like. Ex. 1003, ¶82.

- c. ***Claim 18g – 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,***

Schain discloses element 18g, describing independent software upgrades of the bridges:

The use of separate bridges, application and driver layer modules, also permits the designer to concentrate on the design of each module. Additionally, a change made to one module does not necessarily affect another module, since each are designed to operate independently of one another. This allows the continued fine-tuning of the modules without affecting the other modules in a negative way.

Ex. 1005, ¶51; Ex. 1003, ¶¶84-87.

- d. ***Claim 18h – the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor,***

Schain discloses element 18h, noting that the “data/information stream . . . that contains the actual information being received and transmitted by the computer(s) and digital device(s) connected to the broadband gateway 500. . . . is forwarded to a DOCSIS MAC/PHY layer processor 510.” Ex. 1005, ¶61, Ex. 1003, ¶¶88-93. FIG. 5 of Schain shows “a hardware view of the broadband gateway 500,” including the DOCSIS MAC/PHY layer processor 510. Ex. 1005, ¶61, FIG.

5; Ex. 1003, ¶92. The DOCSIS MAC/PHY layer processor is a DOCSIS MAC processor. Ex. 1003, ¶89.

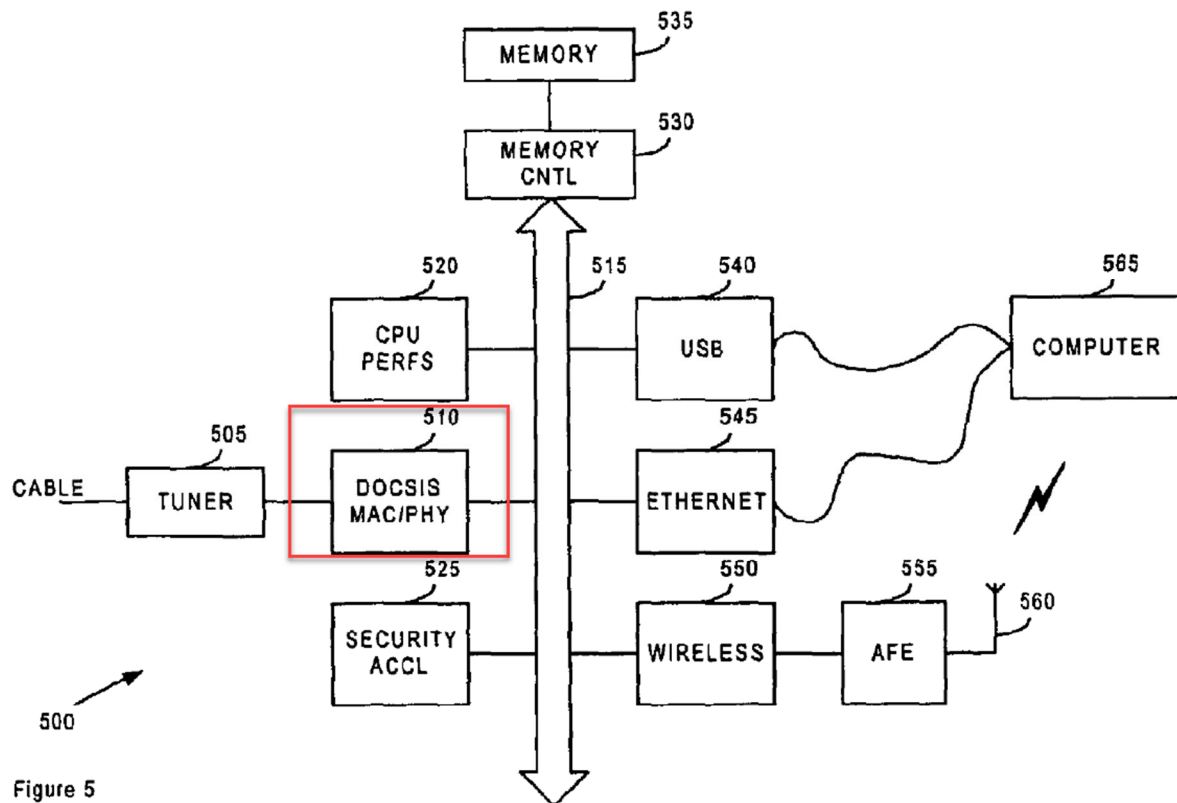


Figure 5

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

In the '775 Patent, the DOCSIS controller is “configured to implement VoIP

functionality,” Ex. 1001, 6:4-5, *see also* 2:8-11.

Schain describes a “cable applications layer” which implements the DOCSIS socket-based processes” Ex. 1005, ¶¶32; Ex. 1003, ¶91. A POSITA would have understood the cable application layer to implement VoIP functionality, since the PacketCable Component Reference Model defines VoIP as a component that operates outside of a cable modem while requiring the QoS features available in cable modems in 2002. VoIP is, and has always been, considered an “application.” Ex. 1003, ¶91. A POSITA would have understood that the functions of the ‘cable applications layer’ are analogous to VoIP, and the ‘DOCSIS controller’ is located within the ‘cable applications layer.’ Ex. 1003, ¶91.

- e. ***Claim 18i – 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,***

The combination of Schain and Thi discloses element 18i. Ex. 1003, ¶¶94-108. Schain discloses forwarding packets between the two bridges. “[T]he entire packet may be passed. The source bridge can write the entire contents of the packet into the memory space of the virtual data link 315 and the virtual data link 315 passes the packet onto the destination bridge.” Ex. 1005, ¶50; Ex. 1003, ¶94. Alternatively, “the transfer of the packet in the virtual data link 350 may be implemented as simply as a transfer of a memory address. . . . The memory address

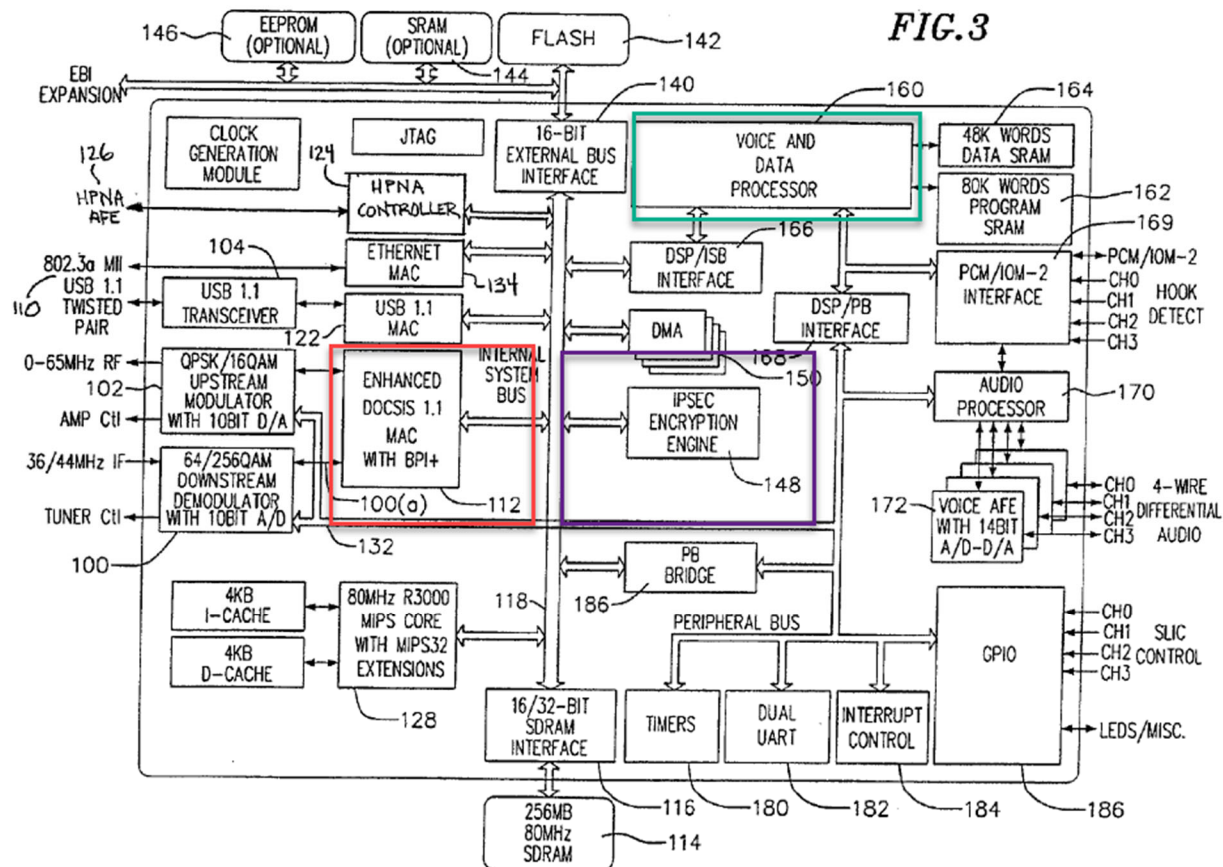
of the packet in the memory is transferred from one bridge to the other bridge via the virtual data link 350.” Ex. 1005, ¶49; Ex. 1003, ¶94. Schain explains that “[t]hrough the use of separate modules, interaction between the processing performed by the two bridges is reduced. . . . By reducing the interaction, there is a reduced chance of errors resulting from unintended corruption of data and memory.” Ex. 1005, ¶49. Further, “[t]he reduction in the interaction between the modules also permits better balancing the processing resources . . . [which] makes it easy to achieve maximum overall processing rate and efficiency.” *Id.*

A person skilled in the art would understand that downstream PDU packets are such information received at the cable tuner. Ex. 1003, ¶96. A POSITA would understand that PDU packets are simply transmitted units of information; the ’775 Patent does not describe what PDU packets are or any particular use for such packets, merely stating that they are transmitted. *Id.* Thus, the ’775 patent assumes that a POSITA would understand what PDU packets are and how they are used. *Id.* Based on these disclosures, 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. *Id.*

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, this is disclosed by Thi. Ex. 1003, ¶97.

Thi discloses a “DOCSIS Media Access Controller (MAC) 112.” Ex. 1006, ¶121, *see also* FIG. 3 below; Ex. 1003, ¶98. “The DOCSIS MAC 112 extracts DOCSIS MAC frames from MPEG-2 frames, processes MAC headers, and filters and processes messages and data. Ex. 1006, ¶122, Ex. 1003, ¶98. The DOCSIS MAC of Thi is a DOCSIS MAC processor per claim 18. Ex. 1003, ¶98.

Thi also discloses a “voice and data processor 160” which “supports the exchange of voice, as well as fax and modem The voice and data processor may be implemented with . . . ***voice over packet based networks***.” Ex. 1006, ¶147 (*emphasis added*), *see also* FIG. 3 below; Ex. 1003, ¶99. The voice and data processor 160 is a DOCSIS controller as described in the ’775 Patent, in which the DOCSIS controller is “configured to implement VoIP functionality,” Ex. 1001, 6:4-5, *see also* 2:8-11; Ex. 1003, ¶99.



According to Thi, “[w]ith regard to path latency and the jitter in that latency, it is not desirable to have packets assembled on one end of the network and leisurely delivered at the other end.” Ex. 1006, ¶246, FIG. 3; Ex. 1003, ¶100. Thus, Thi states that its system should process and forward packets to minimize the path along which packets are forwarded to avoid undesirable latencies. Ex. 1003, ¶¶100-101. This objective was well-known in the art at the time. Ex. 1003, ¶102.

Thi further describes forwarding PDUs downstream: “The MAC header processor routes all PDUs matching the network gateway extended header type to the downstream DES 284 for decryption.” Ex. 1006, ¶170; Ex. 1003, ¶103.

In Thi, the PDUs are processed and routed downstream using the MAC processor. Ex. 1006, ¶170, 122; Ex. 1003, ¶103. “The downstream DES 284 receives data packets and control signals from the header processor” and “decrypts packets using [a] key” in the “baseline privacy header.” Ex. 1006, ¶171; Ex. 1003, ¶105. Figure 3 of Thi shows the MAC processor right next to the DES 284, and the voice and data processor 160 is “at the other end.” Ex. 1006, FIG. 3 (*above*), ¶146; Ex. 1003, ¶104. 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. *See* Ex. 1001, 3:49-53 (“Data networking engine 120 is responsible for all data networking processing including advanced multi-port bridging/routing with NAT/firewall and VPN (block 250) and home networking applications”); Ex. 1006, ¶¶170-171; Ex. 1003, ¶105.

Given that Thi expressly states that “it is not desirable to have packets assembled on one end of the network and leisurely delivered at the other end,” Thi teaches forwarding the downstream PDU packets without involvement of the DOCSIS controller, which is both at the other end and configured for a completely

different purpose. Ex. 1006, ¶¶146-147, 121-122; Ex. 1003, ¶104. In other words, Thi teaches that processing and forwarding the downstream PDUs without involvement of the DOCSIS controller will boost throughput. Ex. 1003, ¶¶104-107.

One skilled in the art would have been motivated to modify Schain to process and forward PDU packets at the DOCSIS MAC processor without involvement of the DOCSIS controller. Schain notes that it is advantageous to process packets “by a single bridge and . . . not cause any interference or place any processing load on the other bridge. Ex. 1005, ¶46; Ex. 1003, ¶¶35-39. “The reduction in the interaction between the modules also permits better balancing the processing resources . . . [which] makes it easy to achieve maximum overall processing rate and efficiency.” Thus, Schain recognizes that processing efficiency improvements, which can be achieved through reduced interaction between different components of the cable modem system, is desirable. *Id.* Thi illustrates a more specific way to achieve such efficiency improvements in the context of the DOCSIS MAC processor and controller, noting downstream packets should be transmitted along the shortest possible path to avoid latency and jitter issues Ex. 1003, ¶38. Given both disclosures emphasize the importance of maintaining efficiency and avoiding unnecessary processing, a POSITA would have been motivated to implement Thi’s processing downstream PDU packets and

forwarding the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput in Schain's system. Ex. 1003, ¶39. The skilled person would have had a reasonable expectation of success in making this adjustment, given the conventionality of the components used and the relatively high level of skill in the art. Ex. 1003, ¶¶40-41.

f. ***Claim 18j – a data bus that connects the data networking engine to the cable modem engine,***

Schain discloses element 18j: “The converted information stream is provided to a common bus 515 by the DOCSIS MAC/PHY processor 510. The common bus 515 is used by devices and functional units in the broadband gateway 500 to share and exchange control information and data.” Ex. 1005, ¶60; Ex. 1003, ¶¶109-111. It was well-known in the art to connect different components using a bus. Ex. 1003, ¶110.

g. ***Claim 18k – 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.***

Schain discloses element 18k, describing “**the partition of the two bridges.**” Ex. 1005, ¶48 (*emphasis added*); Ex. 1003, ¶¶112-116. Schain further notes:

The dual bridge logical architecture means that packets that do not need to cross the interface between the local and external networks are processed by a single bridge and **do not cause any interference or place any processing load on the other bridge.**

Ex. 1005, ¶46 (*emphasis added*); Ex. 1003, ¶113. The bridges are also shown as completely separate. Ex. 1005, FIG. 3; Ex. 1003, ¶¶112-114.

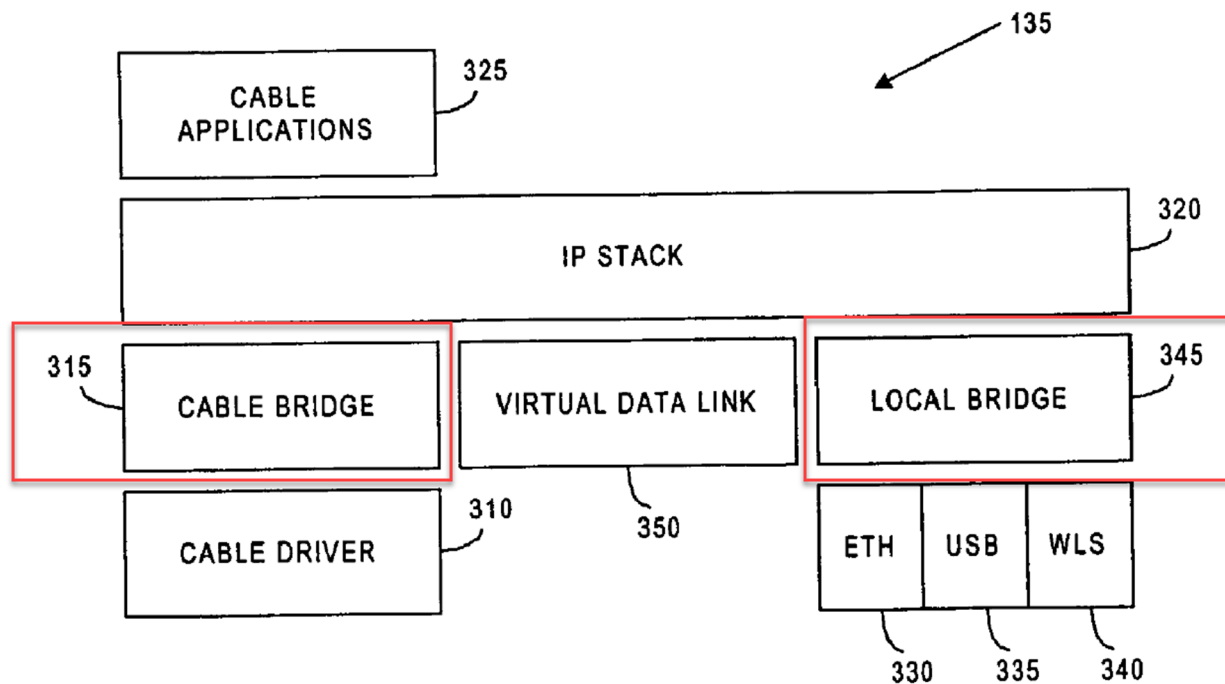


Figure 3

Since the bridges are physically separated, include separate driver layers, and do not cause any interference or place any processing load on the other bridge, the bridges are completely partitioned. Ex. 1003, ¶115.

2. Dependent claim 19 – *A cable modem system as claimed in claim 18, wherein all DOCSIS functions are localized in the cable modem engine.*

Schain discloses claim 19, describing the DOCSIS functions as performed by the cable bridge: “The cable bridge 315 is responsible for processing external packets received at the cable modem and also provides DOCSIS specified filtering of the external packets.” Ex. 1005, ¶46; Ex. 1003, ¶¶117-119. “For example, in a DOCSIS cable modem, the cable applications layer 210 implements the DOCSIS socket-based processes.” Ex. 1005, ¶46. Thus, the cable bridge in Schain is responsible for implementing all DOCSIS functions. Schain describes a design pattern with separation of logical components. Because all DOCSIS functions are implemented by the cable modem engine, a POSITA would understand this to be localization of the DOCSIS functions in the cable modem engine. Ex. 1003, ¶ 118.

B. Ground 2: Claims 18 and 19 are unpatentable as obvious over Perlman in View of Crocker and Fox

The combination of Perlman, Crocker, and Fox discloses a cable modem system including separate, partitioned circuits for data networking and cable modem functionality, and renders claims 18 and 19 obvious.

1. Independent claim 18

a. *Claim 1 Preamble – A cable modem system comprising*³:

Perlman and Crocker each discloses a cable modem system. Perlman discloses “a multimedia system capable of selecting between different network protocols for transmitting and receiving data and multimedia content.” Ex. 1007, ¶ 2; Ex. 1003, ¶122. The multimedia system has a “selectable protocol module 230 which includes standard MPEG-2 logic 234 for processing multimedia cable/television channels and DOCSIS logic 235 for processing packetized data according to the DOCSIS Standard.” Ex. 1007, ¶ 23; see also Ex. 1007, Figure 2A (*below*); Ex. 1003, ¶122. Perlman describes modulating and demodulating signals, thus disclosing a cable modem system. Ex. 1003, ¶123.

³ Petitioner does not take a position as to whether the preamble is limiting.

However, if the Board finds it is limiting, the prior art of either of the two grounds, 1 and 2, discloses it.

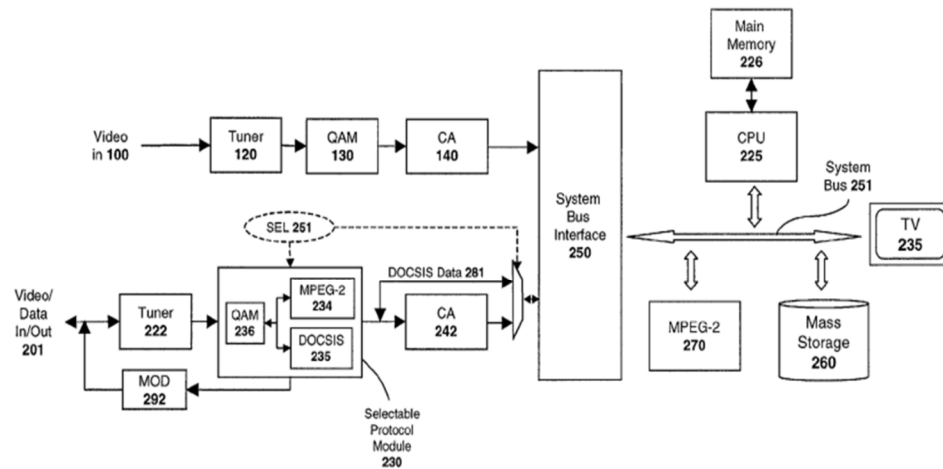


FIG. 2a

To the extent the Board finds Perlman does not explicitly disclose a cable modem system, one is disclosed by Crocker: “One important class of device that may be used to implement the present invention is the Cable Modem Termination System.” Ex. 1008, 13:45-51; Ex. 1003, ¶¶124-125. “In the cable network, the plurality of nodes represents a plurality of cable modems that communicate with at least one CMTS at the centralized termination system.” Ex. 1008, 21:25-29; Ex. 1003, ¶125.

A POSITA would be motivated to combine the multimedia system of Perlman with the functionality and architecture of the CMTS of Crocker. Perlman seeks to provide “a system and method for receiving and transmitting data and multimedia content over a cable network in a more flexible, efficient and intelligent manner.” Ex. 1007, ¶ 10-11; Ex. 1003, ¶¶127-128. Crocker has the same

goals, explaining that “it is also 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, 3:42-45; Ex. 1003, ¶127. A POSITA would thus be motivated to include the improvements of Crocker’s CMTS in Perlman’s multimedia system, which is a closely related technology in the same field, for a more flexible and efficient way of receiving and transmitting data. Ex. 1003, ¶¶127-128.

b. *Claim 18a – a data networking engine implemented in a first circuit that includes at least one processor; and*

The combination of Perlman and Crocker discloses element 18a. Perlman describes a “MPEG-2 logic 234 for processing multimedia cable/television channels, or “processing the incoming multimedia content.” Ex. 1007, ¶¶23-24; Ex. 1003, ¶¶129-133. This MPEG-2 logic is a data networking engine. Ex. 1003, ¶129. Perlman also discloses “software executed by the CPU 225” which is configured to select the MPEG-2 logic when appropriate. Ex. 1007, ¶28. A POSITA would understand a CPU to be a processor. Ex. 1003, ¶130.

To the extent that the Board finds that does not disclose a data networking engine implemented in a first circuit that includes at least one processor, one is disclosed by Crocker. Ex. 1003, ¶131. Crocker describes “line cards 735,” which “may interface with packet-switched networks, thereby connecting the cable

modem system with the Internet.” Ex. 1008, 15:60-65; Ex. 1003, ¶132. Line cards 735 include a “data network interface 735a [which] functions as an interface component between external data sources and the cable system.” Ex. 1008, 15:53-55, FIG. 7; Ex. 1003, ¶132. The line card 735, including the data network interface 735a, therefore is a data networking engine. Ex. 1003, ¶133.

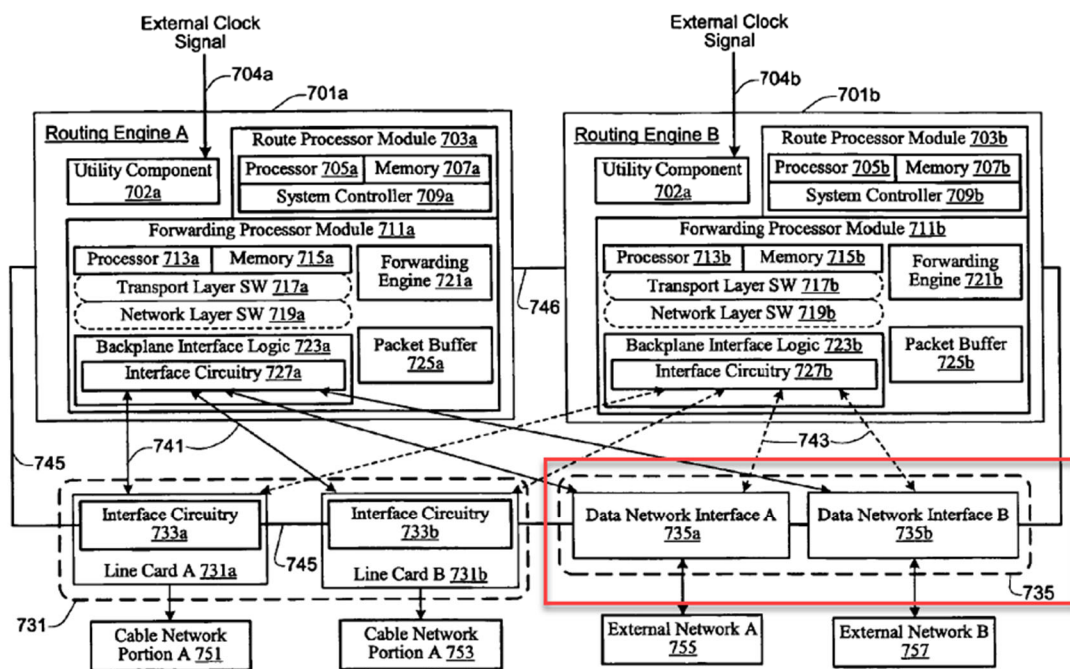


Figure 7 700

A line card was known in the art to be a circuit. Ex. 1003, ¶134. Line cards 735 include at least one processor. Crocker explains: “One skilled in the art would appreciate that multiple processors, a variety of memory formats, or multiple system controllers, for example, can be used in this context as well as in other

contexts while falling within the scope of the present invention.” Ex. 1008, 14:22-27, FIG. 7; Ex. 1003, ¶135.

A POSITA would be motivated to modify the MPEG logic of Perlman with the line cards 735 of Crocker. Ex. 1003, ¶137. The MPEG logic and line cards 735 have similar functionality, and the configuration of the line cards 735 on a first circuit that includes at least one processor would increase the flexibility of the system described in Perlman, which is one of Perlman’s stated goals, as well as a goal of Crocker. Ex. 1007, ¶ 10-11; Ex. 1008, 3:42-45; Ex. 1003, ¶¶137-138.

“[I]mplementing the MPEG logic on a separate circuit, such that the hardware is isolated from other components, would make it easier to modify and update just the MPEG logic without affecting any other components of the system.” Ex. 1003, ¶137. Moreover, “during the early 2000’s, . . . MPEG-4 technology quickly emerged as foundational to the broadcast community’s adoption of the Internet Protocol. . . . these events would manifest to economic incentives for relevant equipment to leverage the chipsets and circuitry becoming available in the timeframe.” *Id.*

Perlman also describes sharing “a single tuner 222, a single CA module 242 and a single selectable protocol module 230 between a multimedia receiver channel (e.g., for receiving cable channels) and a DOCSIS channel, thereby reducing systems cost while at the same time maintaining the same level of

functionality as in prior systems.” Ex. 1007, ¶ 10. Perlman notes that high costs are based in part on the lack of off-the-shelf technology: “Moreover, because the legacy systems shown in FIGS. 1a-b rely on proprietary technology (Such as CA Subsystems developed by third parties), cable providers are limited in their ability to modify the underlying protocols used to transmit multimedia content to the end user.” *Id.*

However, Crocker addresses Perlman’s concerns regarding multiple components, such as circuits, and proprietary technology, stating, “[u]sing the standardized component manufacturers are able to combine different MAC and PHY devices from different vendors, thereby facilitating price and value competition between Vendors.” Ex. 1008, Abstract. Thus, a POSITA would understand that combining Perlman and Crocker would lead to higher efficiency and lower cost than in conventional systems. Ex. 1003, ¶138.

- c. ***Claim 18b – 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;***

The combination of Perlman and Crocker discloses element 18b. Ex. 1003, ¶¶139-147. The MPEG-2 logic is for processing multimedia cable/television channels, or “processing the incoming multimedia content.” Ex. 1007, ¶¶ 23-24.

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.

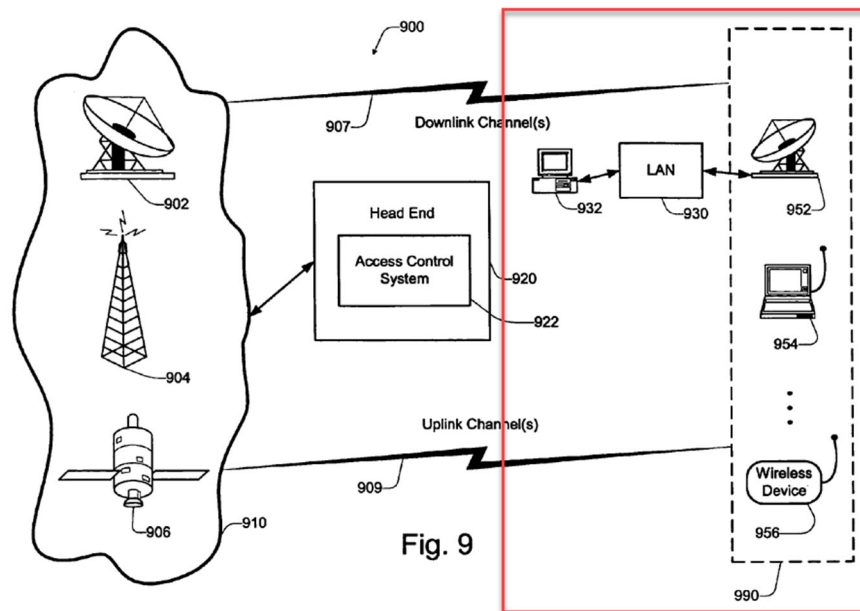
Further, Perlman describes that using prior art systems, “a user is able to concurrently receive two cable broadcast channels while communicating over the Internet (e.g., sending email, browsing Web pages, downloading interactive content related to a particular TV program, ... etc.).” Ex. 1007, ¶28. Perlman also discloses “software executed by the CPU 225” which selects the MPEG-2 logic when appropriate based on the actions of a user. *Id.* Thus, Perlman discloses software that causes the data networking engine to perform the aforementioned home networking functions. Ex. 1003, ¶141.

Further, to the extent that the Board determines that Perlman does not describe the MPEG logic as performing home networking functions including interfacing with customer provided equipment, this element is disclosed by Crocker, which describes the line cards 735 as performing home networking functions. The line cards 735 connecting the CMTS to external networks 755 and 757 “utilize different types of communication protocols (e.g., Ethernet, Frame

Relay, ATM, TCP/IP, etc.).” Ex. 1008, 15:50-53; Ex. 1003, ¶142. The “data network interface,” driven by the line cards discussed above, “may include hardware and software for interfacing to various networks.” In particular, “a data network interface may be implemented on a line card as part of a conventional router for a packet-switched network.” Ex. 1008, 15:57-62; Ex. 1003, ¶143. “Using this type of configuration, the CMTS is able to send and/or receive IP packets to and from the data network interface using, for example, network layer software 719a.” Ex. 1008, 15:62-65

Crocker describes such data networking including interfacing with customer provided equipment, such as computer systems 932 and other wireless devices 956 for home networking:

[A] local area network (LAN) 930 . . . may be further connected to one or more computer systems 932. Another wireless device may be a portable/wireless computer system 954, which is able to transmit and receive information to the Head End via uplink and downlink channels 907 and 909. Other wireless devices 956 may include, for example, wireless telephones, handheld computing devices, etc.



Ex. 1008, 22:11-222, FIG. 9 (annotated).

A POSITA would be motivated to modify the MPEG logic of Perlman based on the teachings of Crocker such that the MPEG logic is 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. This is because the MPEG logic and line cards 735 have similar functionality, and modifying the MPEG logic of Perlman to interface with customer provided equipment as done by the line cards 735 in Crocker would increase efficiency of the system, a stated goal of both Crocker and Perlman. Ex. 1007, ¶ 10-11; Ex. 1008, 3:42-45; Ex. 1003, ¶146.

d. *Claim 18c – a cable modem engine implemented in a second circuit that includes at least one processor,*

The combination of Perlman and Crocker discloses element 18c. Ex. 1003, ¶¶148-158. Perlman describes “DOCSIS logic 235 for processing packetized data according to the DOCSIS standard.” Ex. 1007, ¶23. The DOCSIS logic is a cable modem engine. Ex. 1003, ¶148. Perlman also discloses “software executed by the CPU 225” configured to select the DOCSIS logic when appropriate. Ex. 1007, ¶28. A POSITA would understand a CPU to be a processor. Ex. 1003, ¶149.

To the extent the Board finds this element is not disclosed by Perlman, it is disclosed by Crocker, which describes “line cards 731.” “[L]ine cards 731 may correspond to radio-frequency (RF) line cards which have been configured or designed for use in a cable network. Ex. 1008, 15:46-48, FIG. 7; Ex. 1003, ¶¶150-151. The line cards 731 include “interface circuitry” 733a and 733b connecting to “Cable Network Portions” 751 and 753. Ex. 1008, 14:48, Figure 7, Ex. 1003, ¶151.

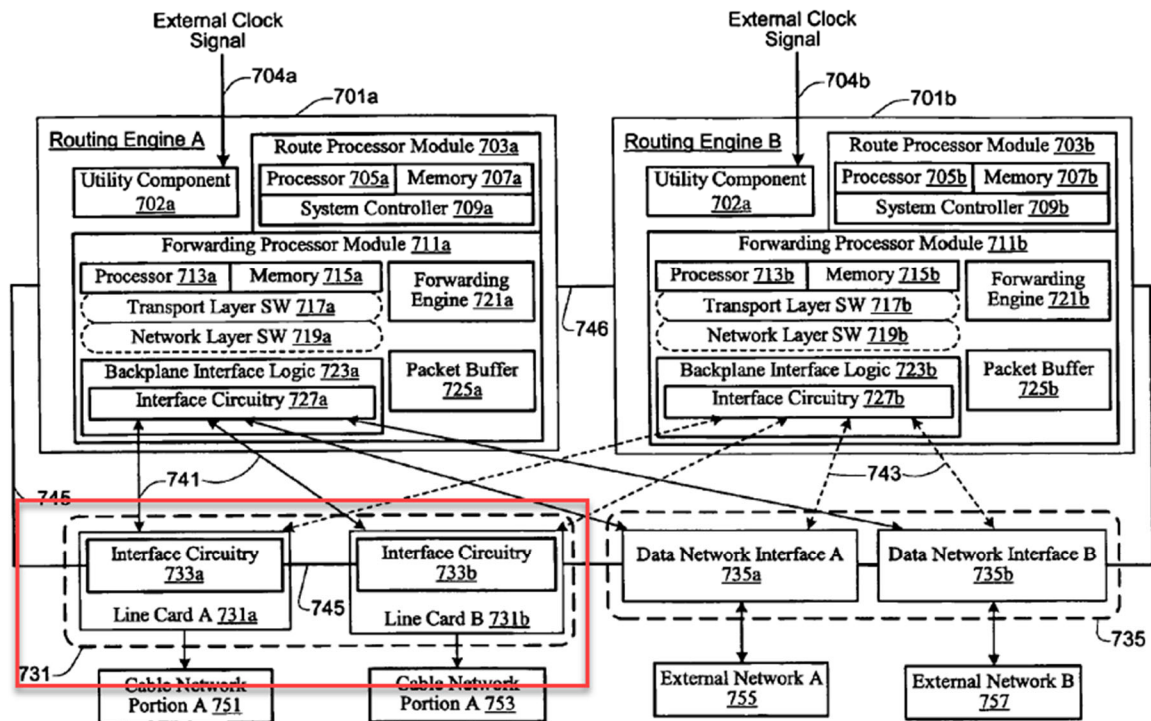


Figure 7 700

A line card was known in the art to be a circuit. Ex. 1003, ¶153. Crocker

FIG. 8 shows a line card for cable networking including a processor:

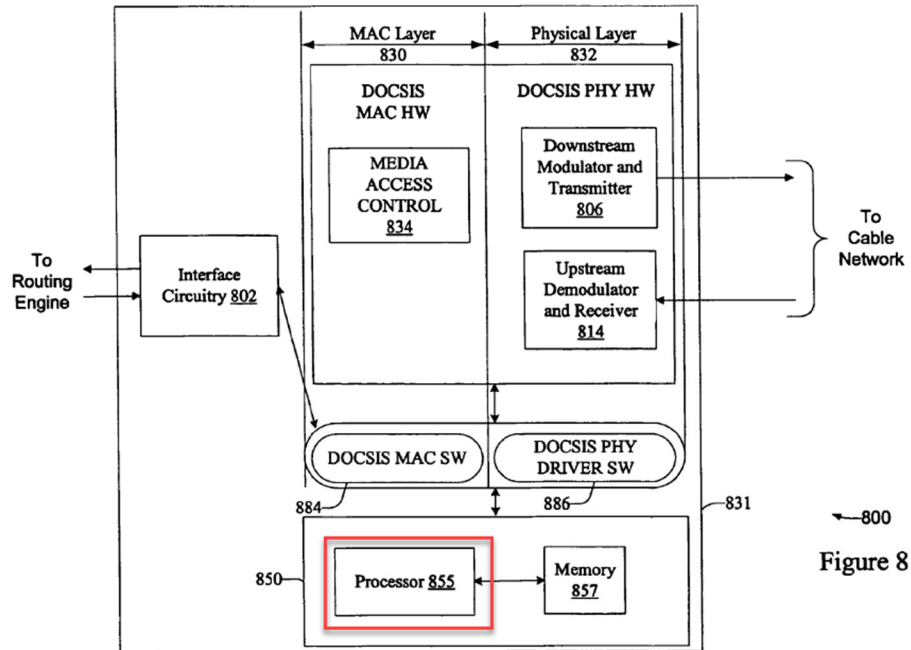


Figure 8

Ex. 1008, 18:61-65, FIG. 8 (annotated); Ex. 1003, ¶154.

A POSITA would have been motivated to modify the DOCSIS logic of Perlman with the line cards 731 of Crocker such that the DOCSIS logic is implemented in a second circuit that includes at least one processor. Ex. 1003, ¶155. This is because the DOCSIS logic and line cards 731 have similar functionality, and the configuration of the line cards 731 on a first circuit that includes at least one processor would increase the flexibility of the system described in Perlman by making any updates or modifications easier and quicker, which is one of Perlman's stated goals, as well as a goal of Crocker. Ex. 1007, ¶10-11; Ex. 1008, 3:42-45; Ex. 1003, ¶¶155-157.

e. Claim 18d – *the second circuit being separate from the first circuit,*

The combination of Perlman and Crocker discloses element 18d. Ex. 1003, ¶¶159-166. Perlman shows and describes MPEG-2 logic and DOCSIS logic as two separate components with different functionality: “MPEG-2 logic 234 for processing multimedia cable/television channels and DOCSIS logic 235 for processing packetized data according to the DOCSIS Standard.” Ex. 1007, ¶ 23; *see also* Figure 2a.

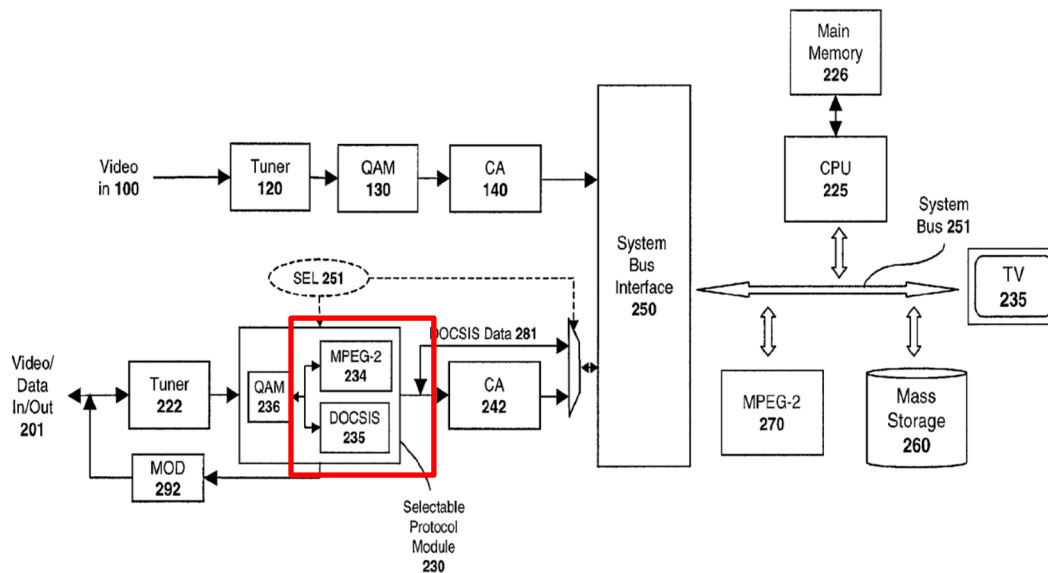


FIG. 2a

Thus, a POSITA would understand that the MPEG-2 logic and DOCSIS logic could be implemented on separate circuits. Ex. 1003, ¶161. To the extent

the Board finds that this element is not disclosed by Perlman, it is disclosed by Crocker, which notes that the line cards 731 are separate from the line cards 735:

According to a specific embodiment, the plurality of line cards may include different types of line cards which have been specifically configured to perform specific functions. For example, line cards 731 may correspond to radio-frequency (RF) line cards which have been configured or designed for use in a cable network. Additionally, line cards 735 may correspond to network interface cards which have been configured or designed to interface with different types of external networks (e.g. WANs, LANs.) utilizing different types of communication protocols.

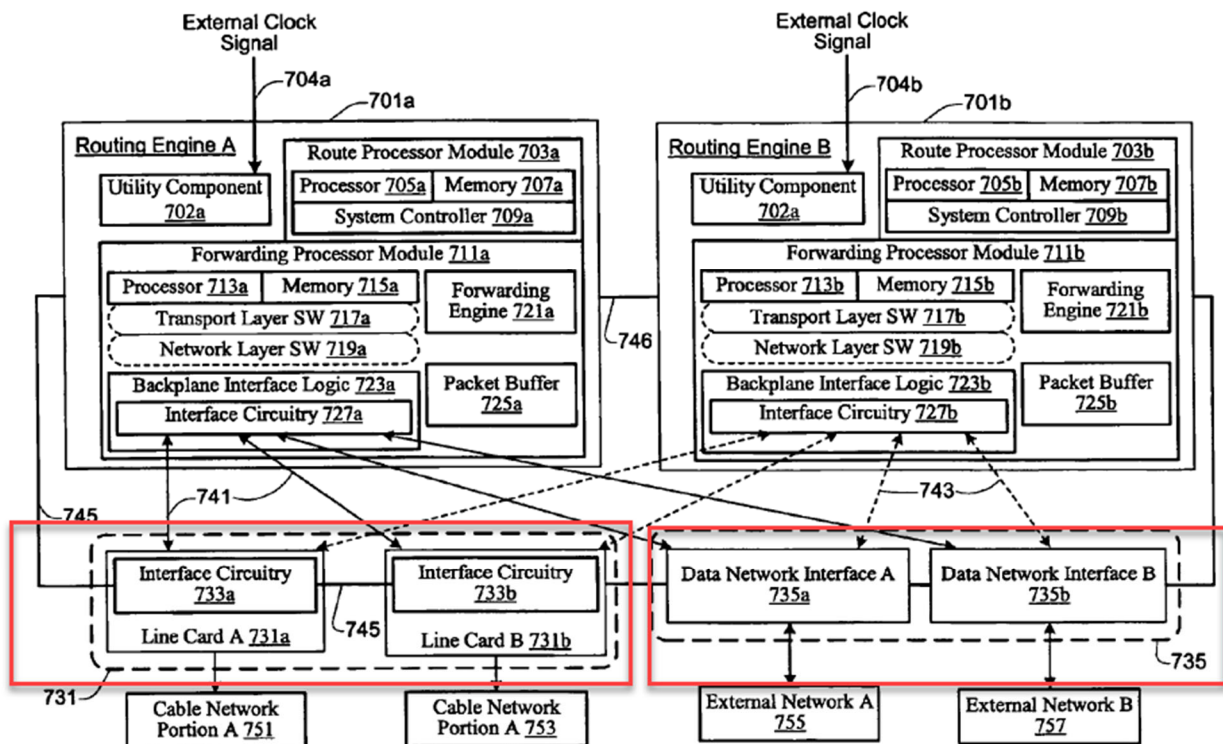


Figure 7 700

Ex. 1008, 15:43-52, FIG. 7 (annotated); Ex. 1003, ¶162.

A POSITA would have been motivated to modify the system in Perlman with a first circuit separate from the second circuit as in Crocker. In both Perlman and Crocker, the data networking and cable modem engines have separate functionalities, and are shown as separate components. Ex. 1007, ¶23; Ex. 1008, 15:43-52; Ex. 1003, ¶166. By implementing the two engines of Perlman on fully separate circuits, as in Crocker, the flexibility and efficiency of the system would be furthered, which is a goal of both Perlman and Crocker. Ex. 1007, ¶¶10-11; Ex. 1008, 3:42-45; Ex. 1003, ¶166. Thus, a POSITA would have been motivated to modify Perlman based on Crocker to achieve that goal of a more flexible system. Ex. 1003, ¶166

- f. ***Claim 18e – 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 combination of Perlman and Crocker discloses element 18e. Ex. 1003, ¶¶167-176. Perlman states that the DOCSIS logic “process[es] packetized data according to the DOCSIS Standard.” Ex. 1007, ¶ 23. This is cable modem functionality other than the functions performed by the data networking engine. Ex. 1003, ¶167. Perlman also discloses “software executed by the CPU 225” which

is configured to select DOCSIS logic based on the actions of the user. Ex. 1007, ¶28; Ex. 1003, ¶168. Thus, when software is executed by the CPU, a processor, the DOCSIS logic performs cable modem functions. Ex. 1003, ¶168

To the extent the Board finds that 18e is not disclosed by Perlman, it is disclosed by Crocker, which describes various cable modem functions performed by the line cards 731. Ex. 1003, ¶169. The “line cards 731 may correspond to radio-frequency (RF) line cards which have been configured or designed for use in a cable network.” Ex. 1008, 15:46-48; Ex. 1003, ¶169. In the cable network, the plurality of nodes represents a plurality of cable modems that communicate with at least one CMTS at the centralized termination system using at least one shared access upstream and downstream channel. Ex. 1008, 21:25-29; Ex. 1003, ¶170.

The line cards 731 perform different functionality than the line cards 735, which “may correspond to network interface cards which have been configured or designed to interface with different types of external networks (e.g. WANs, LANs.) utilizing different types of communication protocols (e.g. Ethernet, Frame Relay, ATM, TCP/IP, etc),” i.e., home networking functions. Ex. 1008, 15:49-53, FIG. 7; Ex. 1003, ¶¶171-172.

Crocker discloses, “line card 800 may be configured or designed to implement selected aspects of the DOCSIS functionality.” Ex. 1008, 17:67-18:1; FIG. 8; Ex. 1003, ¶172. “[L]ine card 800 provides functions on several network

layers, including a physical layer 832, and a Media Access Control (MAC) layer 830.” Ex. 1008, 18:4-7. “MAC layer 830 includes a MAC hardware portion 834 and a MAC software portion 884. The MAC layer software portion may include *software relating to DOCSIS MAC functionality*, etc. The MAC layer hardware and software portions operate together to provide the above-described DOCSIS MAC functionality.” Ex. 1008, 18:29-34 (emphasis added).

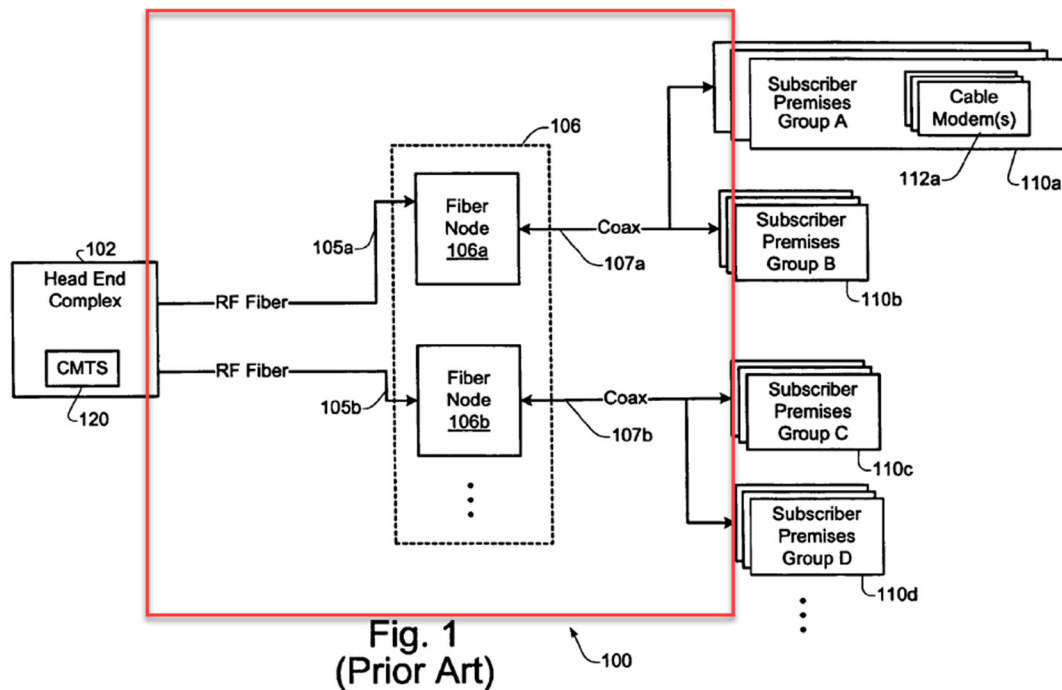
A POSITA would have been motivated to modify the DOCSIS logic of Perlman to include the functionality of the line card 731 in Crocker, such that the DOCSIS logic is programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine. Both the DOCSIS logic and line card 731 have similar functionalities, and are implemented in analogous systems. Ex. 1007, ¶ 28; .Ex. 1008, 15:46-48; Ex. 1003, ¶¶173-175. Adding the functionality of the DOCSIS engine of Perlman to include the functionality of the line card 731 in Crocker would increase the efficiency of the system, which is a goal of both Perlman and Crocker. Ex. 1007, ¶¶ 10-11; Ex. 1008, 3:42-45; Ex. 1003, ¶175. As noted above, Perlman encourages combining different devices from different vendors to create a more efficient and cost-effective system, and in 2002 there was motivation in the field to leverage the chipsets and circuitry becoming available. Ex. 1003, ¶¶137-

138. Thus, a POSITA would have motivated to modify Perlman based on Crocker to achieve a more efficient system. Ex. 1003, ¶¶173-175

g. *Claim 18f – the cable modem functions including interfacing with cable media, and*

The combination of Perlman and Crocker discloses element 18f. Ex. 1003, ¶¶177-183. Perlman states that “if the user chooses to browse Web pages on the Internet, send an email or perform any other data transactions while watching a cable channel via tuner 120, the selection logic 251 will select the DOCSIS module 235 for communicating DOCSIS-formatted data over the cable provider's network using the modulator unit 292 and the tuner 222 (for transmitting and receiving data, respectively).” Ex. 1007, ¶25. Thus, the DOCSIS module 235, which is another name for DOCSIS logic 235, interfaces with cable media. Ex. 1003, ¶177.

To the extent the Board finds that 18f is not disclosed by Perlman, it is disclosed by Crocker. Ex. 1003, ¶178. Crocker notes that the interface circuitry is connected by fiber optic cables to fiber nodes that are connected via coaxial cable to subscriber premises, wherein groups of cable modems reside. Thus, the cable modem functions interface with cable media. Ex. 1008, 2:16-30, FIG. 1; Ex. 1003, ¶179. A person skilled in the art would have understood “cable media” to include physical media such as coaxial cabling and fiber optics. Ex. 1003, ¶180.



Although FIG. 1 is referred to as prior art, Crocker does not purport to improve upon the manner of media by which a CMTS and cable modems are connected (i.e., via a combination of coaxial cables and fiber optic pathways). Ex. 1003, ¶179.

A POSITA would have been motivated to modify the DOCSIS logic of Perlman to include the functionality of the line card 731 in Crocker, such that the DOCSIS logic functionality include interfacing with cable media. Both the DOCSIS logic and line card 731 have similar functionalities, and are implemented in analogous systems. Ex. 1007, ¶28; Ex. 1008, 15:46-48; Ex. 1003, ¶181. Adding the functionality of the DOCSIS engine of Perlman to include the functionality of

the line card 731 in Crocker would increase the efficiency of the system, which is a goal of both Perlman and Crocker. Ex. 1007, ¶¶10-11; Ex. 1008, 3:42-45; Ex. 1003, ¶182. As noted above, Perlman encourages combining different devices from different vendors to create a more efficient and cost-effective system, and in 2002 there was motivation in the field to leverage the chipsets and circuitry becoming available. Ex. 1003, ¶¶137-138. Thus, a POSITA would have motivated to modify Perlman based on Crocker to achieve a more efficient system. Ex. 1003, ¶¶181-182.

h. *Claim 18g – 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,*

The combination of Perlman in view of Crocker and Fox discloses element 18g. Perlman describes “selection logic 250 [that] switches between MPEG-2 logic 232 for receiving multimedia content and DOCSIS logic 233 for processing packetized DOCSIS data/content.” Ex. 1007, ¶27; Ex. 1003, ¶¶184-191. “Thus, the embodiment illustrated in FIG. 2b provides two separate communication channels (one unidirectional channel and one two-way channel) which process content and data under the DOCSIS standard when selected by selection logic 250-251. *Id.* Since 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. Ex. 1003, ¶185.

Similarly, in Crocker, the line cards 731 and 735 are physically separate, as described above with respect to element 18d. Ex. 1008, 2:43-55, FIG. 7; Ex. 1003, ¶187. Since the line cards 731 and 735 are installed on physical separate circuitry, updates to the software of one can be effected independently of updates to the other at least by physically replacing either circuit. Ex. 1003, ¶188.

To the extent that the Board finds that the combination of Perlman and Crocker does not explicitly disclose performing separate upgrades of the separate engines, such functionality was well-known at the time. Ex. 1003, ¶189. Fox describes a “modular software architecture that solves some of the more common scenarios seen in existing architectures when software is upgraded or new features are deployed.” Ex. 1009, 4:34-36. “[S]oftware applications may be upgraded and downgraded independent of each other and without having to reboot the computer system.” Ex. 1009, Claim 1.

A POSITA would have been motivated to use independent upgrades as described in Fox in a cable modem system as described in Perlman in view of Crocker. Ex. 1003, ¶190. Fox explains that being able to separately upgrade different components helps avoid Internet outages and other interruptions. Ex. 1009, 1:6-7, 8:43-56; Ex. 1003, ¶190. Thus, a POSITA would have been motivated

to modify the cable modem system of Perlman in view of Crocker to include independent software upgrades to allow one engine to execute seamlessly while the other engine is being upgraded. Ex. 1003, ¶190.

i. ***Claim 18h – the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor,***

The combination of Perlman and Crocker discloses element 18h. Ex. 1003, ¶¶192-196. Perlman describes “DOCSIS logic 233 for processing packetized DOCSIS data/content.” Ex. 1007, ¶27; Ex. 1003, ¶192.

To the extent the Board finds that Perlman does not explicitly disclose the DOCSIS logic including a controller and MAC processor, Crocker specifies that the line card 731 includes

MAC layer 830 [which] includes a MAC hardware portion 834 and a MAC software portion 884. The MAC layer software portion may include software relating to DOCSIS MAC functionality, etc. The MAC layer hardware and software portions operate together to provide the above-described DOCSIS MAC functionality. In a preferred embodiment, **MAC controller 834** is dedicated to performing some MAC layer functions, and is distinct from **processor 855**.

Ex. 1008, 18:29-36 (*emphasis added*), FIG. 8; Ex. 1003, ¶193.

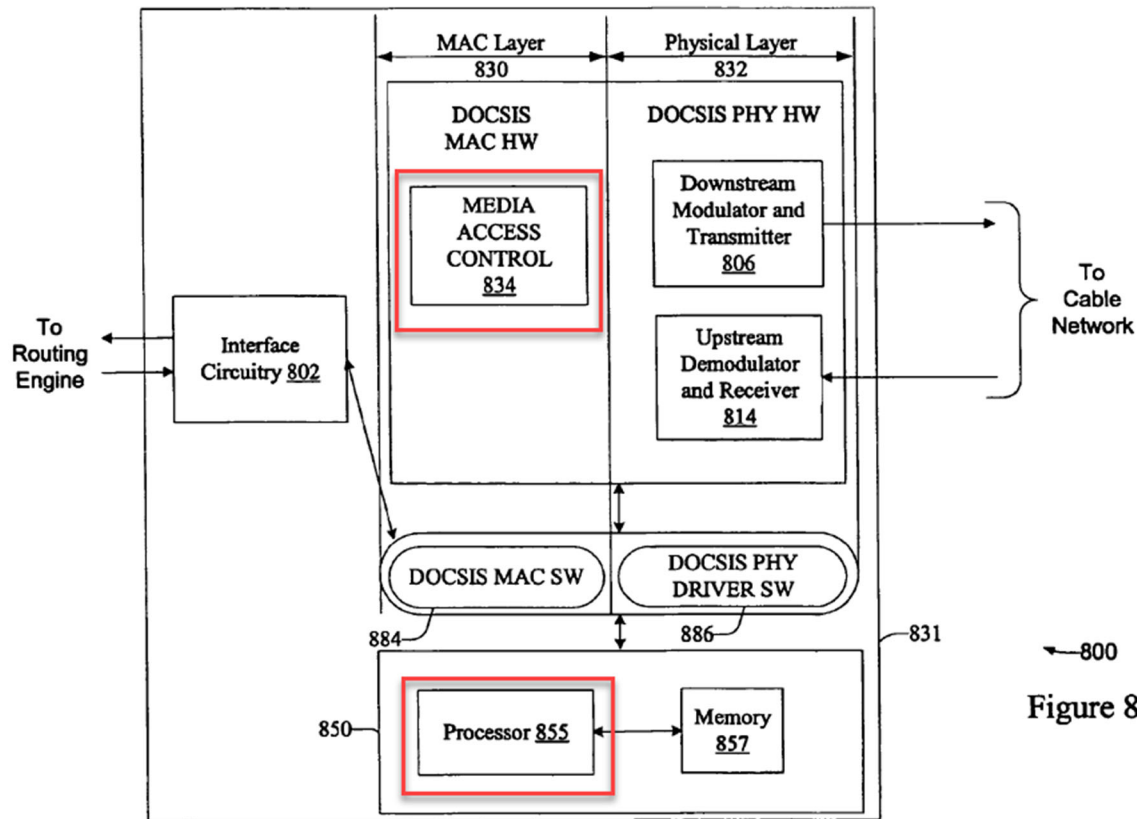


Figure 8

A 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. Ex. 1003, Ex. 1003, ¶195.

- j. ***Claim 18i – 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,***

The combination of Perlman and Crocker discloses element 18i. Ex. 1003, ¶¶197-203. Perlman’s “DOCSIS logic 233 [is] for processing packetized DOCSIS data/content.” Ex. 1007, ¶27; Ex. 1003, ¶197.

Crocker also describes forwarding packets to the line card 735 for data networking: “packets are forwarded by the forwarding engine to a data network interface 735a.” Ex. 1008, 14:66-15:2; Ex. 1003, ¶¶198-200. Although the forwarding engine is not pictured as part of the line card 731, it would be a trivial modification to have the DOCSIS processor 855 of the line card 731 perform this function. Ex. 1003, ¶200.

A skilled person would have understood the well-known problem of minimizing path lengths to minimize latencies. Ex. 1003, ¶201. Minimizing latencies would create a more efficient system due to reduced delays. *Id.* The DOCSIS controller of Crocker performs separate functionality from that of the DOCSIS MAC processor. *Id.* Including this unrelated component in the forwarding of PDU packets would unnecessarily create a longer path for the data packets, leading to more latency and a less efficient system. *Id.* Thus, it would have been obvious to a POSITA to forward the downstream PDU packets without the involvement of the DOCSIS controller..

k. *Claim 18j – a data bus that connects the data networking engine to the cable modem engine,*

The combination of Perlman and Crocker discloses element 18j. Ex. 1003, ¶¶204-210. Perlman shows the MPEG-2 logic 232 and DOCSIS logic 233 connected. Ex. 1007, FIG. 2a; Ex. 1003, ¶204.

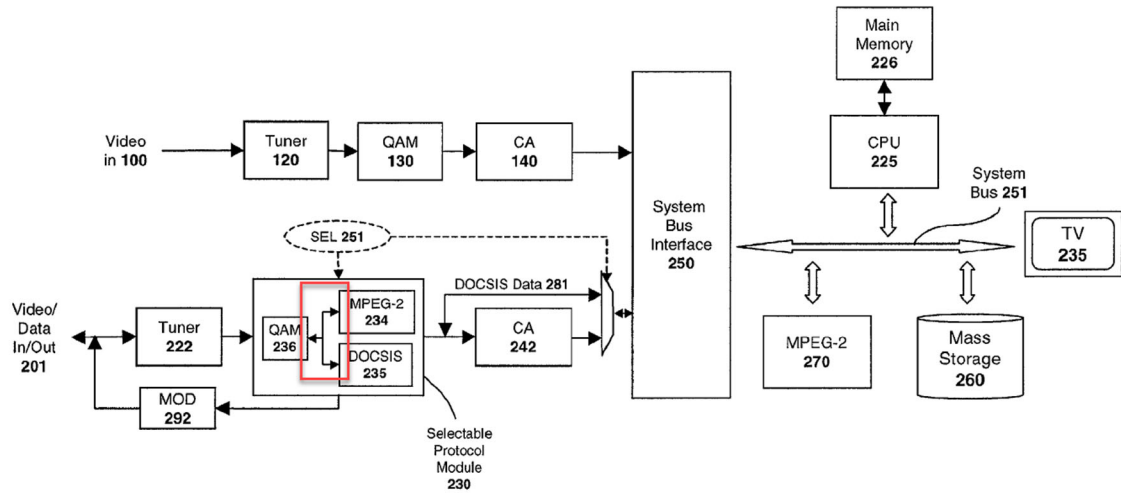


FIG. 2a

Similarly, Crocker shows the line cards 731 and 753 connected. Ex. 1008, FIG. 7; Ex. 1003, ¶205.

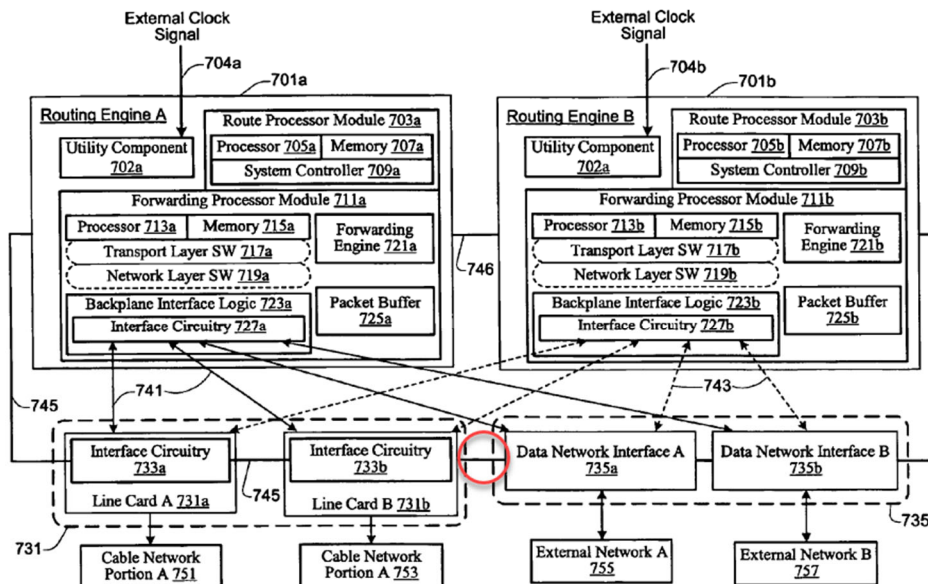


Figure 7 700

Crocker explains that the “lines cards . . . may be configured to use at least one common dedicated line or back plane (e.g. 745). Ex. 1008, 16:33-36; Ex. 1003, ¶206. Such connectors can include, “for example, a backplane line or system bus.” Ex. 1008, 15:15-18; Ex. 1003, ¶207.

Thus, Perlman and Crocker disclose connecting the engines, and disclose that such a connector could be a bus. Accordingly, in view of Crocker and Perlman, a POSITA would have been motivated to connect the engines, e.g., with conventional means such as a data bus, so that they can pass data from one to the other. Ex. 1003, ¶209.

I. *Claim 18k – 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.*

The combination of Perlman and Crocker discloses element 18k. Ex. 1003, ¶¶211-220. In Perlman, “selection logic 250 switches between MPEG-2 logic 232 for receiving multimedia content and DOCSIS logic 233 for processing packetized DOCSIS data/content.” Ex. 1007, ¶27; Ex. 1003, ¶211. Perlman FIG. 2a shows the MPEG-2 logic 232 and DOCSIS logic 233 as completely separate. Ex. 1007, FIG. 2a; Ex. 1003, ¶212.

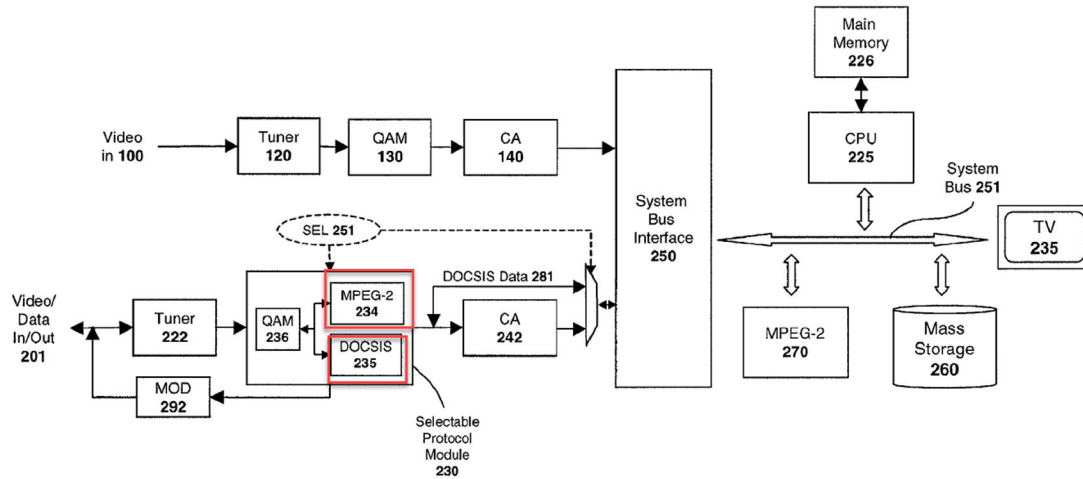


FIG. 2a

Since the MPEG-2 logic and DOCSIS logic are configured to perform different functions and process different content, the two are completely partitioned and perform their respective functions independently. Ex. 1003, ¶213.

Similarly, Crocker notes that the line cards 731 and 735 are completely separate, i.e., partitioned:

According to a specific embodiment, the plurality of line cards may include different types of line cards which have been specifically configured to perform specific functions. For example, line cards 731 may correspond to radio-frequency (RF) line cards which have been configured or designed for use in a cable network. Additionally, line cards 735 may correspond to network interface cards which have been configured or designed to interface with different types of external networks (e.g.

WANs, LANs.) utilizing different types of communication protocols.

Ex. 1008, 15:43-52; FIG. 7; Ex. 1003, ¶214.

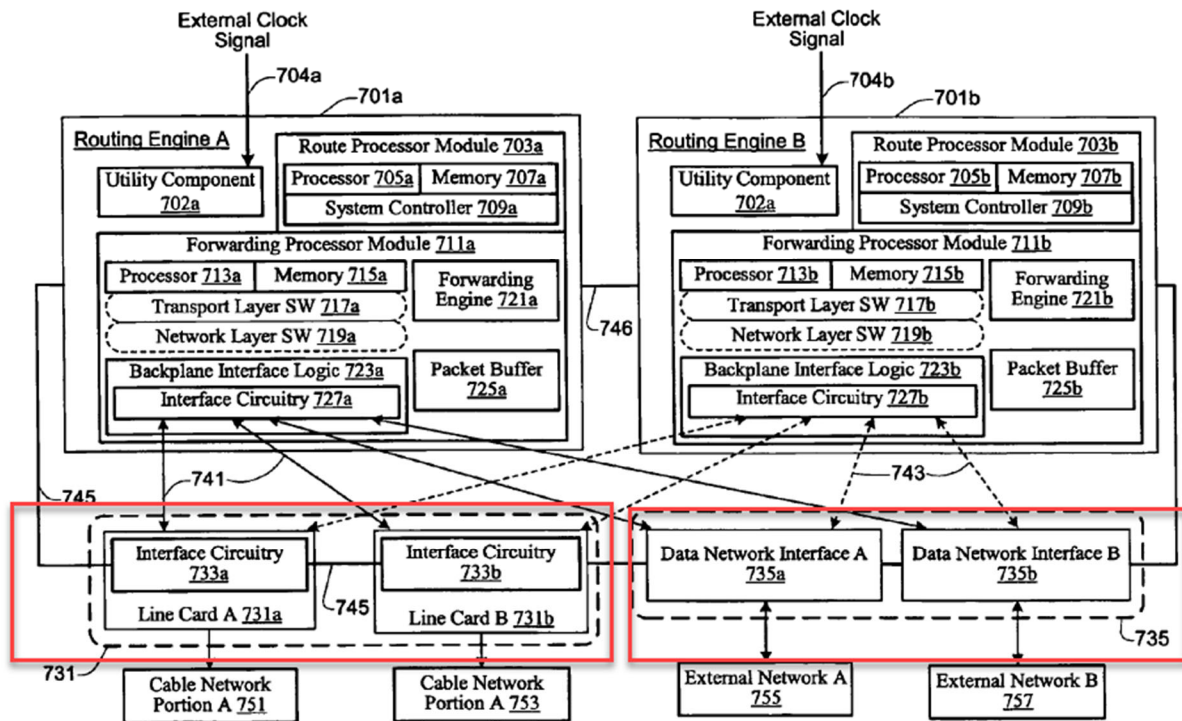


Figure 7 700

Since the line cards 731 and 735 are configured to perform different functions and interface with different types of networks, the two are completely partitioned and perform their respective functions independently. Ex. 1003, ¶¶215-217.

Perlman describes the advantages of different modules being able to execute separately: “In operation, 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 and the QAM logic 236 for processing the incoming multimedia content from the second channel.” Ex. 1008, ¶24. In light of such well-known advantages, a POSITA would have been motivated to completely partition the MPEG-2 logic and DOCSIS logic in Perlman. Ex. 1003, ¶218.

2. Dependent claim 19 – *A cable modem system as claimed in claim 18, wherein all DOCSIS functions are localized in the cable modem engine.*

The combination of Perlman and Crocker discloses claim 19. Ex. 1003, ¶¶221-229. In Perlman, “selection logic 250 switches between MPEG-2 logic 232 for receiving multimedia content and DOCSIS logic 233 for processing packetized DOCSIS data/content.” Ex. 1007, ¶27; Ex. 1003, ¶221. In Perlman, “a communication channel [is] configured to switch between a first mode in which the communication channel receives and decodes a first multimedia signal using MPEG logic, and a second mode in which the communication channel transmits and receives data and/or multimedia content according to the Data Over Cable Service Interface Specification (“DOCSIS) standard. Ex. 1007, Abstract; Ex. 1003, ¶221. The DOCSIS functionality is confined to the DOCSIS logic 233, as the

MPEG logic is configured for processing different, non-DOCSIS, input. Ex. 1003, ¶¶221-222.

Similarly, Crocker discloses the DOCSIS functions being localized in the line cards 731.

[The] different types of line cards . . . have been specifically configured to perform specific functions. For example, line cards 731 may correspond to radio-frequency (RF) line cards which have been configured or designed for use in a cable network. Additionally, line cards 735 may correspond to network interface cards which have been configured or designed to interface with different types of external networks (e.g. WANs, LANs.) utilizing different types of communication protocols.

Ex. 1008, 15:43-52; Ex. 1003, ¶223.

Crocker explains that “the Data Over Cable System Interface Specification (DOCSIS) . . . standard has been publicly presented by Cable Television Laboratories, Inc. (Louisville, Colo.), in a document entitled, Radio Frequency Interface Specification. Ex. 1008, 2:7-14; Ex. 1003, ¶224.

Since the line cards 731 are for RF communications and DOCSIS is for RF interfacing, whereas the line cards 735 are for interfacing with different types of external networks, the DOCSIS functions are localized in the line cards 731. Ex. 1003, ¶¶225-227.

Thus, Perlman and Crocker, alone or in combination, disclose claim 19. Ex. 1003, ¶¶228-229.

VII. Secondary Considerations Cannot Overcome the Strong Evidence of Obviousness

Where, as here, a strong *prima facie* case of obviousness exists, secondary considerations may not dislodge the final conclusion of obviousness. *See, e.g., Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). At the institution stage, in light of the “absence of a complete evidentiary record,” Petitioner need not further address secondary considerations. *Ranir, LLC v. The Procter & Gamble Co.*, IPR2017-01878, Paper 7 at 32 (Feb. 7, 2018); *accord 3Shape A-S v. Align Tech., Inc.*, IPR2019-00160, Paper 9 at 34 (June 11, 2019) (at the institution stage, “it is premature to determine how much weight to give to ... evidence of objective indicia”). This is particularly apposite here, where the Examiner did not rely on any evidence of secondary considerations in allowing the claims of the ’775 Patent. *See Zip Top, LLC v. Stasher, Inc.*, IPR2018-01216, Paper 14 at 37 (Jan. 17, 2019). Petitioner reserves the right to respond to any evidence of secondary considerations that Patent Owner may proffer.

VIII. This Petition Should Not Be Discretionarily Denied

A. The Petition Should Not Be Denied Under the *Fintiv* Factors

The *General Plastics* analysis is inapplicable here as the '775 Patent has not previously been the subject of a post-grant proceeding. Under the “*Fintiv* factors,” the Board asserted it may consider parallel litigation, including an early trial date, in determining whether to institute under 35 U.S.C. § 314(a). *NHK Spring Co., Ltd., v. Intri-Plex Technologies, Inc.*, IPR2018-00752, Paper 8 at 19–20 (PTAB Sept. 12, 2018) (precedential); *Apple v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 2–3, 6 (PTAB Mar. 20, 2020) (precedential). Those factors favor institution here.

Factor 1 - Whether the Court Granted a Stay or May Grant One if a Proceeding is Instituted.

Neither party has requested a stay of the corresponding District Court case in this proceeding. Thus, the District Court has not ruled on this issue. This factor does not weigh for or against discretionary denial. *Apple v. Fintiv*, IPR2020-00019, Paper 15, 11–12 (informative).

Factor 2 - Proximity of the Court's Trial Date to the Statutory Deadline for a Final Written Decision. “This factor looks at the proximity of the trial date to the date of [FWD] to assess the weight to be accorded a trial date set earlier than the expected [FWD] date.” *Shenzhen Carku Tech. Co., Ltd. v. The Noco Co.*, IPR2020-00944, Paper 20 at 61 (PTAB Nov. 12, 2020). The District Court has not

yet set a trial date. *See* Ex. 1012 (Claim Construction Scheduling Order in District Court Litigation).

Trial dates are notoriously unreliable and should be an insufficient basis upon which to deny institution. “A court’s general ability to set a fast-paced schedule is not particularly relevant,” especially where “the forum itself has not historically resolved cases so quickly.” *In re Apple*, No 20-135, slip op. at 16 (Fed. Cir. Nov. 9, 2020); *DISH Network L.L.C. v. Broadband iTV, Inc.*, IPR2020-01280, Paper 17 at 13-16 (PTAB Feb. 4, 2021). The Federal Circuit found error in the Board’s reliance on the case’s scheduled trial date. *In re Apple*, No 20-135, slip op. at 16. It would be error for the Board to speculatively rely upon the current schedule.

The Board has repeatedly been persuaded by the uncertainty in litigation timelines regardless of a set trial date, especially when within a few months of the expected FWD. *Sand Revolution*, Paper 24 at 8-9; *see also* IPR2021-00255, Paper 22 at 11-12 (PTAB Aug. 23, 2021) (declining to exercise discretionary denial when the trial date was set for only two months after the expected FWD). These same uncertainties are present and equally as persuasive here.

Factor 3 - Investment in the Parallel Proceeding by the Court and the Parties. The parties have made only minimal investment in this litigation to date. Plaintiff’s infringement contentions identifying the asserted claims were served on

September 15, 2023 and October 27, 2023. As the Board explained in *Fintiv*, where “the petitioner filed the petition expeditiously, such as promptly after becoming aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution under *NHK*.” *Apple v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 1 (PTAB Mar. 20, 2020) (precedential). Further, opening claim construction briefs are not due until May 17, 2024, and no substantive orders have been issued. *See* Ex. 1012. This weighs in favor of institution. *See, e.g., Nokia of America Corp and Ericsson Inc. v. IPCOM, GMBH & Co. KG*, IPR2021-00533, Paper 10 at (PTAB Aug. 12, 2021) (“If, at the time of institution, the district court has not issued substantive orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution.”).

Factor 4 - Overlap Between Issues Raised in the Petition and in the Parallel Proceeding. Petitioner challenges all asserted claims of the ’775 Patent in this petition. Further, Petitioner stipulates that if the Board institutes the Petition, then Cox will not seek resolution in the District Court of any ground of invalidity relied upon herein. In so stipulating, Cox seeks to avoid multiple proceedings addressing the validity of the ’775 Patent based on any of the same grounds. This factor weighs in favor of institution.

Factor 5 - Whether the Petitioner and the Defendant in the Parallel

Proceeding are the Same Party. The Parties are the same in the Underlying Litigation. However, members of the Board have noted *Fintiv* addresses only the scenario in which the petitioner is unrelated to a defendant in a parallel proceeding, finding this should weigh against denying institution, but that *Fintiv* “says nothing about situations in which the petitioner is the same as, or is related to, the district court defendant.” *Cisco Sys., Inc. v. Ramot at Tel Aviv Univ. Ltd.*, IPR2020-00122, Paper 15, 10 (PTAB May 15, 2020) (APJ Crumbley, dissenting) (noting that disfavoring a “defendant in the district court” is “contrary to the goal of providing district court litigants an alternative venue to resolve questions of patentability”).

Factor 6 - Other Circumstances that Impact the Board’s Exercise of

Discretion, Including the Merits. As discussed in detail above, every element of the Challenged Claims of the ’775 Patent is either expressly shown in the prior art or is obvious in view of well-known art. Director Vidal stated her recent memorandum, the PTAB will not deny institution based on *Fintiv* if there is compelling evidence of unpatentability as is the case here. Ex. 1013, 4-5.

B. The Petition Should Not Be Denied Under The *Advanced Bionics* Framework

35 U.S.C. § 325(d) reads, in relevant part, that “[i]n determining whether to institute or order a proceeding ... 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.” In determining whether to exercise its discretion to deny institution, the Board utilizes a two-part framework:

1. whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and
2. if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH, Case No. IPR2019-01469, Paper 6, 8 (PTAB Feb. 13, 2020) (precedential).

During prosecution of the application that eventually issued as the ’775 Patent, the Office relied upon Schain under 35 U.S.C. § 102. In response, Patent Owner made no arguments that Schain does not disclose the elements in the then-pending independent claims. Ex. 1002, 65 (Office Action of Sept. 2, 2011); *Id.*, 56 (Response of March 2, 2012).

This Petition does not rely on Shain as anticipatory. Rather, the Petition relies on Schain for the same elements presented in the Office Action and to which the Patent Owner offered no argument. Ground 1 demonstrates the claims are obvious over Schain in view of Thi, which discloses elements added by Patent Owner by amendment. Thus, the Examiner could not have considered Ground 1. Ground 2 demonstrates the claims are also obvious over Perlman in view of Crocker and Fox. The Examiner never considered this combination. Thus, neither ground is the same or substantially the same as those previously considered by the Examiner. Accordingly, step 1 of the two-part framework is not satisfied, and the Petition should not be discretionarily denied.

IX. Conclusion

In view of the foregoing, a reasonable likelihood exists that Petitioner will prevail with respect to claims 18 and 19 of the '775 Patent. The Board should institute this IPR.

X. Mandatory Notices

A. Real Parties in Interest (37 C.F.R. § 42.8(b)(1))

Cox Communications, Inc.; Coxcom, LLC; and Cox Communications California, LLC are the real parties in interest for this Petition.

B. Related Matters (37 C.F.R. § 42.8(b)(2))

The '775 Patent is asserted against Petitioner in *Entropic Communications, LLC v. Cox Communications, Inc.*, et al., No. 2:23-cv-01049-JWH-KES (C.D. CA. Feb. 10, 2022) and is also asserted in *Entropic Communications, LLC v. Comcast Corporation, et al.*, No. 2:23-cv-01050-JWH-KES (C.D. CA. Feb. 10, 2022). The '775 Patent was previously asserted in *Entropic Communications, LLC v. Charter Communications, Inc.*, et al., No. 2:22-cv-00125-JRG (E.D. Tex. April 27, 2022), which was dismissed Dec. 10, 2023.

C. Payment of Fees (37 C.F.R. § 42.103)

This Petition requests review of 7 (18 and 19) claims of the '775 Patent and is accompanied by payment of \$41,500, which includes the \$19,000 IPR request fee and the \$22,500 post-institution fee. *See* 37 C.F.R. § 42.15(a). Thus, this Petition meets the fee requirements under 35 U.S.C. § 312(a)(1). The Board is hereby authorized to charge any additional fees required by this action to Deposit Account No. 20-1430.

D. Power of Attorney (37 C.F.R. § 42.10)

Powers of attorney are filed herewith in accordance with 37 C.F.R. § 42.10(b).

**E. Designation of Lead and Backup Counsel (37 C.F.R. § 42.8(b)(3))
and Service Information (37 C.F.R. § 42.8(b)(4))**

<u>Lead Counsel</u>	<u>Backup Counsel</u>
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Petitioner may be served via email to its lead and backup counsel at the email addresses above and to: Cox-Entropic-IPR@ktslaw.com.

Respectfully submitted,

By: /John C. Alemanni/
John C. Alemanni
Registration No. 47,384
Lead Counsel for Petitioner

CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing Petition for *Inter Partes* Review excluding any table of contents, table of authorities, certificates of service or word count, or appendix of exhibits or claim listing, contains 13,996 words according to the word-processing program used to prepare this paper (Microsoft Word). Petitioner certifies that this Petition for *Inter Partes* Review does not exceed the applicable type-volume limit of 37 C.F.R. § 42.24(a).

Dated: February 15, 2024

/John C. Alemanni/
Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of this Petition for *Inter Partes* Review of U.S. Patent No. 8,223,775, including its supporting Exhibits (1001-1013) has been served via USPS Priority Mail Express on August 9, 2022 upon Patent Owner's correspondence address of record for U.S. Patent No. 8,223,775:

McAndrews Held & Malloy, Ltd.
500 West Madison Street, Suite 3400
Chicago, IL 60661

The Petition has also been served via email to lead trial counsel for litigation at the following address:

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Petition for *Inter Partes* Review
U.S. Patent No. 8,223,775

Sarah Kamran – skamran@kilpatricktownsend.com
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Respectfully,

Dated: February 15, 2024

By: /John C. Alemanni/
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