

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RPX CORPORATION,
Petitioner,

v.

PARITY NETWORKS, LLC,
Patent Owner.

Case IPR2018-00099
Patent 6,252,848 B1

Before DEBRA K. STEPHENS, BRYAN F. MOORE,
KAMRAN JIVANI, *Administrative Patent Judges*.

DEBRA K. STEPHENS, *Administrative Patent Judge*.

FINAL DECISION
Inter Partes Review
35 U.S.C. § 318(a)

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6(c), and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that RPX Corporation (“Petitioner”) has not shown by a preponderance of the evidence that claims 1, 4, 5, and 8–31 of U.S. Patent No. 252,848 (Ex. 1001, “the ’848 Patent”) are unpatentable.

Procedural History

Petitioner and Huawei Enterprise USA, Inc., Huawei Technologies USA, Inc., Huawei Technologies Co., Ltd., and Huawei Investment and Holding Co. (collectively, “Huawei”) filed a petition for *inter partes* review (Paper 2 (“Pet.”)) challenging claims 1, 4, 5, and 8–31 (the “challenged claims”) of U.S. Patent 6,252,848 B1 (Ex. 1001 (“’848 Patent”)) (35 U.S.C. § 311).

Petitioner relies on the following references in asserting its grounds:

Reference	Exhibit
Wu-chang Feng, Dilip Kandlur, Debanjan Saha, and Kang G. Shin, <i>Understanding TCP Dynamics in an Integrated Services Internet</i> , PROCEEDINGS OF 7TH INTERNATIONAL WORKSHOP ON NETWORK AND OPERATING SYSTEM SUPPORT FOR DIGITAL AUDIO AND VIDEO, 279–90 (May 1997) (“Feng”)	1005
Paul Ferguson, <i>Simple Differential Services: IP TOS and Precedence, Delay Indication, and Drop Preference</i> , INTERNET DRAFT < draft-ferguson-delay-drop-02.txt > (March 1998) (“Ferguson”)	1007
Admitted Prior Art (“APA”) that includes Sally Floyd and Van Jacobson, <i>Random Early Detection Gateways for Congestion Avoidance</i> , 1993 IEEE/ACM TRANSACTIONS ON	1001

NETWORKING (August 1993) (“Floyd”), incorporated by reference in the ’848 Patent Background	
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Petitioner further relies on the Declaration of Dr. Tal Lavian (Ex. 1102).

Parity Networks, LLC (“Patent Owner”) timely filed a Preliminary Response (Paper 6 (“Prelim. Resp.”)). Pursuant to 35 U.S.C. § 314(a), we instituted an *inter partes* review based on our decision that Petitioner had demonstrated a reasonable likelihood of prevailing as to at least one of the challenged claims of the ’848 Patent (Paper 8 (“Dec.”)). Accordingly, we instituted an *inter partes* review on the grounds asserted in the Petition, specifically: (i) claims 1, 4, 5, 8–10, 12–19, and 21–23 of the ’848 Patent under 35 U.S.C. § 103 over Feng, Admitted Prior Art, and Floyd¹, and (ii) claims 11, 20, and 24–31 of the ’848 Patent under 35 U.S.C. § 103 over Feng, Admitted Prior Art, Floyd, and Ferguson.

Patent Owner filed a Patent Owner Response (Paper 11 (“PO Resp.”)). Patent Owner further relies on the Declaration of Dr. Melendez (Ex. 2001). Huawei and Patent Owner filed a Joint Motion to Terminate (Paper 12) and a Joint Motion to Keep Business Confidential (Paper 13), which we granted (Paper 15).

Petitioner filed a Reply (Paper 19 (“Pet. Reply”)) to Patent Owner’s Response (PO Resp.). Pursuant to guidance provided in the Patent Trial and Appeal Board issued guidance for requesting sur-replies in an updated Trial Practice Guide (PTAB Trial Practice Guide Update (August 2018)), Patent Owner requested authorization to file a sur-reply which we authorized (Paper 20). Patent Owner subsequently filed a Patent Owner’s Sur-Reply (Paper 23 (“Sur-Reply”)).

¹ Because Petitioner relies on Admitted Prior Art that specifically identifies Floyd as incorporated by reference, we clarified the grounds proffered by Petitioner to include Floyd (Dec. 15–17).

Petitioner filed a Motion to Strike Patent Owner's Sur-Reply (Paper 27) and Patent Owner filed an opposition to Petitioner's Motion to Strike (Paper 28). At the parties' request (Papers 22, 24), an Oral Hearing was held on January 23, 2019, a transcript of which is included in the record (Paper 31, "Tr.").

II. BACKGROUND

A. *Related Matters*

Petitioner indicates the '848 Patent was asserted in *Parity Networks, LLC v. Alcatel-Lucent USA, Inc.*, C.A. No. 6:16-cv-01367-RWS-KNM; *Parity Networks, LLC v. Huawei Technologies USA, Inc.*, C.A. No. 6:16-cv-01306-RWS-KNM; *Parity Networks, LLC v. Juniper Networks, Inc.*, C.A. No. 6:17-cv-00495; *Parity Networks, LLC v. Ericsson Inc.*, C.A. No. 6:17-cv-00526 (Pet. ix). Patent Owner identifies all of these related matter, except for *Parity Networks, LLC v. Alcatel-Lucent USA, Inc.*, C.A. No. 6:16-cv-01367-RWS-KNM (Paper 5, 2).

In addition to the instant Petition, Petitioner concurrently filed a second petition for *inter partes* review of claims 1, 4, 5, and 8–31 in IPR2018-00098 (Pet. ix; Paper 5, 2); however, an *inter partes* review was not instituted. A request for *inter partes* review on the '848 Patent was also filed in IPR2018-01619; however, an *inter partes* review was not instituted in that IPR either.

B. *'848 Patent (Ex. 1001)*

The '848 Patent, titled "System Performance in a Data Network Through Queue Management Based on Ingress Rate Monitoring," issued on June 26, 2001. The '848 Patent describes a method for optimizing system performance in a data network which includes a plurality of ingress ports and output queues, through ingress rate monitoring ('848 Patent, Abstract; 1:9–12). Figure 1 of the '848

Patent illustrates a data flow diagram in accordance with a preferred embodiment and is reproduced below.

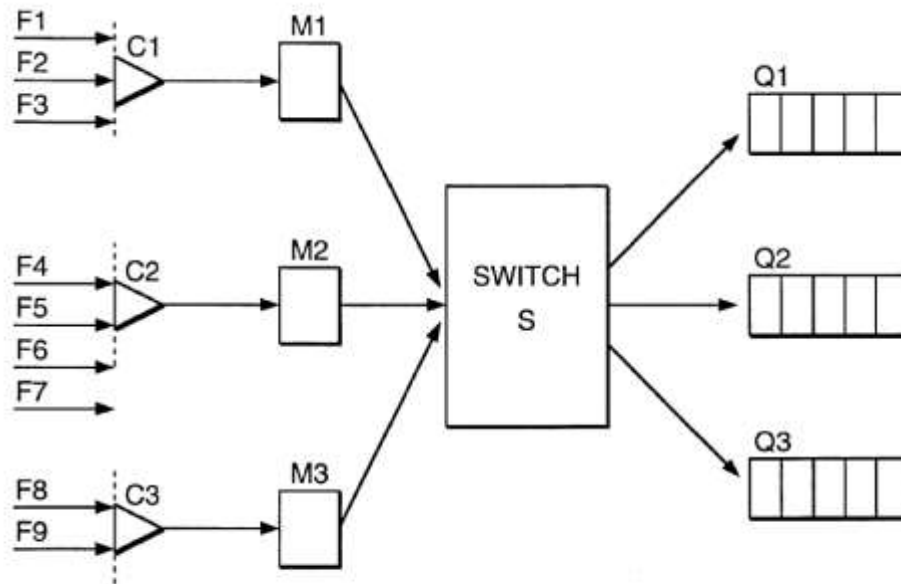


FIG. 1

As shown in the data flow diagram of Figure 1, Flows F1–F9 are input into data channels C1–C3 (Ex. 1001, 3:65–4:1). The channels pass the data from the flows F1–F9, through designated traffic monitors M1–M3 which pass the data to switch S, which in turn passes the data to designated queues Q1–Q3 (*id.* at 4:1–3, 8–12). “The data in each of flows F1–F9 comprises a sequence of packets (i.e., units of data)” which are passed through respective data channels, traffic monitors and queues (*id.* at 4:7–12). As part of the process control, each packet is marked in the corresponding traffic monitor through which the packet passes (i.e., one of M1–M3), by, preferably, using a designated bit of the packet to indicate the marking (*id.* at 4:12–16). A marking can be based on measurements taken at the traffic monitor through which the packet passes, as well as other data including a flow

profile associated with each of flows F1–F9 (*id.* at 4:16–18). The '848 Patent further describes that

the flow profile associated with a flow includes a lower threshold and an upper threshold for the bandwidth (i.e., average data rate), and a packet is marked as “LOW[,]” “NORMAL[,]” or “[]HIGH” according to whether the concurrently measured bandwidth is respectively below both thresholds, between the thresholds, or above both thresholds

(*id.* at 4:19–25).

A packet is then dropped into the corresponding queue (i.e., one of Q1–Q3), based on an assigned drop probability and a random test (*id.* at 4:26–27). Figure 2 (Ex. 1001), reproduced below, illustrates the probability of dropping a packet is assigned according to average queue size and the packet marking.

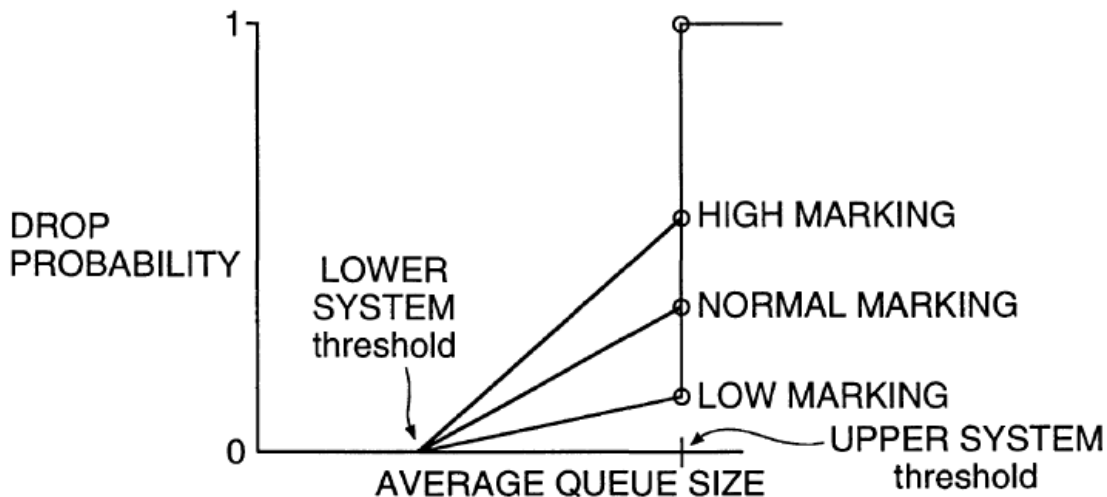


FIG. 2

Figure 2 illustrates the probability of dropping a packet (*id.*). As shown in Figure 2, the drop probability is determined from the marking curve which plots average queue size and the packet marking of “HIGH,” “NORMAL,” or “LOW” (*id.* at

4:29–34). “Once the drop probability of a packet is determined, then the packet may or may not be dropped according to a random test (i.e., generation of a random number); otherwise, the packet is enqueued” (*id.* at 34–37).

According to the ’848 Patent, “the dropping of packets effectively signals congestion in a data network[,] to a higher-level protocol . . . and the higher-level protocol then responds by slowing down the overall flow of data in the network” (*id.* at 5:17–20). In the Random Early Detection (RED) algorithm, dropping of packets without regard to characteristics of a flow is slowed, resulting in packets being dropped in a flow that is critical for system performance but not responsible for congestion in the system (*id.* at 5:21–24). The ’848 Patent, by contrast, “allows the system to adjust packet dropping for an individual flow based on its potential effect on system performance” thereby enhancing communication to the higher-level protocol (*id.* at 26–28).

As illustrated in Figure 2, “each of the marking curves gives a value of zero for the drop probability for average queue sizes less than a common threshold” labeled as “LOWER SYSTEM threshold” and “gives a value of one for the drop probability for average queue sizes greater than a common threshold,” denoted as “UPPER SYSTEM threshold” (*id.* at 5:32–37). Each of the curves is a linear function for average queue sizes between LOWER SYSTEM threshold and UPPER SYSTEM threshold, with curves for each of HIGH MARKING, NORMAL MARKING, and LOW MARKING (*id.* at 5:38–43).

C. Challenged Claims

Of the challenged claims, claims 1, 15, and 24 are independent claims. Claims 4, 5, and 8–14 depend, directly and indirectly from claim 1; claims 16–23

depend directly and indirectly from claim 15; and claims 25–31 depend directly and indirectly from claim 24. Claim 15, reproduced below, is illustrative:

15. A method for optimizing performance independently of user in a data network including a plurality of ingress ports and output queues, each of the plurality of ingress ports receiving packets from a plurality of flows, comprising the steps of:

monitoring ingress rates of a plurality of flows, each flow including a plurality of packets passing from an ingress port to an output queue, each flow having a profile related to flow characteristics;

marking each packet with one of a plurality of flow markings based on criteria including the ingress rate and the flow profile;

adjusting a drop probability of each packet at an output queue, according to a value of a drop function taken as a function of a queue size, the drop function being selected from a plurality of drop functions, each drop function being associated with one of the plurality of markings.

(Ex. 1001, 7:56–8:7).

III. ANALYSIS

A. *Claim Construction*

In an *inter partes* review filed before November 13, 2018, a district court-type claim construction approach may be applied if a party requests such a construction and certifies that the involved patent will expire within 18 months from the entry of the Notice of Filing Date Accorded to Petition, in a motion under 37 C.F.R. § 42.20 within thirty days from the filing of the petition (37 C.F.R. § 42.100(b)).

Here, neither party submitted a Motion for District Court-Type Claim Construction in accordance with 37 C.F.R. § 42.100(b), certifying that the challenged patent will expire within 18 months of the entry of the Notice of Filing Date Accorded to Petition. We take judicial notice that the patent will expire within eighteen months from the entry of the Notice of Filing Date Accorded to Petition. We thus decide to apply district court-type claim construction due to the expiration date of the patent. We note our rules do not preclude us from deciding to apply district court-type claim construction under the circumstances presented here.

Under district court-type claim construction, claim terms are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record (*Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); *see also In re Rambus Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012) (“While claims are generally given their broadest possible scope during prosecution, the Board’s review of the claims of an expired patent is similar to that of a district court’s review.”) (internal citation omitted)). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence” (*DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17)). There is a “heavy presumption,” however, “that a claim term carries its ordinary and customary meaning” (*CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citation omitted)).

B. Principles of Law

Obviousness and Evidentiary Burden

A claim is unpatentable under 35 U.S.C. § 103(a) if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains” (*KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007)). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., so-called secondary considerations (*see Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966)).

“A determination of whether a patent claim is invalid as obvious under § 103 requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered” (*Apple v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted)). “This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination” (*id.*).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable” (*Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”))). This burden never shifts to Patent Owner (*see Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden

of proof in *inter partes* review)). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements” (*In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016)).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this final stage, we determine whether a preponderance of the evidence of record shows that the challenged claims would have been obvious over the proposed combinations of prior art.

C. *Level of Skill*

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention (*Graham*, 383 U.S. at 17). “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry” (*Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention (*In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995)). The level of ordinary skill in the art may be reflected by the prior art of record (*Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001)). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field (*GPAC*, 57 F.3d at 1579). In a given case, one or more factors may predominate (*id.*). Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art (*Innovention Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011)) (“A less sophisticated level of

skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.”)).

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis (*Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham*, 383 U.S. at 17–18; *Ryko Mfg. Co.*, 950 F.2d at 718)). Petitioner asserts that a person of ordinary skill in the art at the time of the invention

would have had at least: (a) a bachelor’s degree in computer science or electrical engineering, along with four or more years of experience with networks and networking devices, or (b) a master’s degree in computer science or electrical engineering, and two or more years of experience with networks and networking devices

(Pet. 4 (citing Ex. 1002 ¶¶ 31–33)). Patent Owner does not dispute the educational level or experiential aspects of Petitioner’s definition in its Response (*see generally*, PO Resp.).

We note that the assessment appears consistent with the level of ordinary skill in the art at the time of the invention as reflected in the prior art in the instant proceeding (*see Okajima*, 261 F. 3d at 1355). Based on our review of the ’848 Patent, the types of problems and solutions described in the ’848 Patent and cited prior art, and the testimony of Dr. Tal Lavian (Ex. 1002 ¶¶ 31–33), we adopt and apply Petitioner’s description of a skilled artisan as possessing (a) a bachelor’s degree in computer science or electrical engineering, along with four or more years of experience with networks and networking devices, or (b) a master’s degree in computer science or electrical engineering, and two or more years of experience with networks and networking devices.

D. Overview of the Asserted Prior Art

1. Feng (Ex. 1005)

Feng is an article entitled “Understanding TCP Dynamics in an Integrated Services Internet” (Ex. 1005, Title). Feng teaches “minor extensions to [] packet queuing and discard mechanisms used in routers, coupled with simple control mechanisms at the source that enable the network to guarantee minimal levels of throughput to different network sessions while sharing the residual network capacity in a cooperative manner” (*id.* at Abstract, 279). In the scheme proposed by Feng, “each reserved session is associated with a traffic envelope. Traffic is policed at the source and packets conforming to the envelope are marked. Non-conformant traffic and best-effort traffic is injected into the network unmarked” (Ex. 1005, 279). The routers in the network, use “an enhanced random early detection (RED) and discard mechanism” in which “[b]oth marked and unmarked packets share the same FIFO [(first in, first out)] queue” (*id.*). “When the queue length at the router exceeds a certain threshold, packets are dropped randomly . . . in the enhanced RED (ERED) gateway, marked packets have a lower drop probability than the unmarked packets” (*id.* at 279–280).

2. The ’848 Patent Background of the Invention (“Admitted Prior Art”)

In the “Description of Related Art,” the ’848 Patent describes “[a] packet is dropped according to the RED algorithm (Random Early Detection) in the packet’s corresponding queue (i.e., one of Q1’–Q3’). The ’848 Patent further discloses

the probability of dropping a packet is set to zero for values of the average queue size less than a lower RED threshold value and is set to one for values greater than an upper RED threshold value. For values of the average queue size in between the two thresholds, the drop probability depends linearly on the average queue size

(’848 Patent, 1:39–44). This paragraph further states “[d]etails of the RED Algorithm are given in ‘Random Early Detection Gateways for Congestion Avoidance’ (Sally Floyd and Van Jacobson, 1993 IEEE/ACM Transactions on Networking), incorporated herein by reference” (*id.* at 1:47–51).

3. *Floyd (Ex. 1036)*

Floyd is an article entitled “Random Early Detection Gateways for Congestion Avoidance” (Ex. 1036). Floyd discusses “Random Early Detection (RED) gateways for congestion avoidance in packet-switched networks” (*id.* at 397, Abstract). Floyd describes “notifying connections of congestion either by dropping packets arriving at the gateway” or by marking “each arriving packet with a certain probability, where the exact probability is a function of the average queue size” (*id.*).

4. *Ferguson*

Ferguson is an article entitled “Simple Differential Services: IP TOS and Precedence, Delay Indication, and Drop Preference” (Ex. 1007). Ferguson focuses, in part, on “a ‘drop preference’ to indicate the relative priority of a particular packet as it is transited through the network” (*id.* at 2).

E. *Asserted Obviousness over Feng, Admitted Prior Art, and Floyd: claims 1, 4, 5, 8–10, 12–19, and 21–23*

Petitioner contends the combination of Feng, Admitted Prior Art, and Floyd teaches claims 1, 4, 5, 8–10, 12–19, and 21–23 (Pet. 13–52).

1. *Claims 1 and 15*

- a) *“monitoring ingress rates of a plurality of flows, each flow including a plurality of packets passing from an ingress port to an output queue, each flow having a profile related to flow characteristics”*

Petitioner relies on Feng to teach “monitoring ingress rates of a plurality of flows, each flow including a plurality of packets passing from an ingress port to an output queue, each flow having a profile related to flow characteristics” (Pet. 26–30). Specifically, Petitioner asserts Feng discloses a reserved Tspec or “traffic envelope” flow “(i.e. the claimed ‘plurality of flow’) are ‘monitored and policed at the network entry points’” (*id.* at 26–27 (citing Feng, 280; Ex. 1002 ¶ 169)). According to Petitioner, “[t]hese entry point[s]— i.e. the point[s] of ingress into the network — are either ‘at the source,’ or ‘at the boundary between the corporate or campus intranet and the Internet’” (*id.* at 27 (citing Feng, 280; Ex. 1002 ¶ 169)). Petitioner further contends “Feng discloses that the ingress rate of the flow is monitored according to the flow profile (i.e. Tspec)” by using token buckets (*id.* at 28). Specifically, Petitioner asserts Feng describes “[t]he token bucket monitors the ingress rate—it accounts for the packets as they flow into the network by decrementing a counter” which operates as the “leaky bucket” of the ’848 Patent “except the counter is *incremented* as packets enter the monitor and decremented over time” (*id.* at 28 (citing Ex. 1002 ¶¶ 174–175)).

Patent Owner argues Feng fails to teach the disputed limitation (PO Resp. 7–13). We agree. We address each of the parties’ contentions in turn and specifically, we address Patent Owner’s contentions that:

1. An egress rate is not an ingress rate;

2. Packet loss can occur on a transmission line, thus, the egress rate is not the ingress rate;
3. The location where the ingress rate is measured is at a specific location;
4. Feng monitors the flow at the source, not at an ingress port;
5. Even if Feng monitored at the boundary, the monitoring would be of the egress rate of the network; and
6. Petitioner has failed to show that an ordinarily skilled artisan would modify Feng to monitor ingress rate.

Ingress rate:

Patent Owner asserts Feng fails to teach “monitoring ingress rates” (PO Resp. 6–7 (citing Ex. 2001 ¶ 40)). Patent Owner further argues Feng monitors “the output rate of a transmitting device, rather than the ingress rate of a flow into a device” (PO Resp. 11). As explained below, we agree.

Feng describes that a drawback with related art is that “[a] queue can build up (i.e., congest) when the egress rate is less than the ingress rate for that queue” (’848 Patent, 1:16–17). Initially, looking at the recitation of the claim and the disclosure in the ’848 Patent, we determine the ingress monitors are determining the ingress rate (’848 Patent, 45–59, Fig. 3).

Egress rate:

Throughout its arguments, Petitioner asserts Feng’s disclosure of the source forming the monitoring and thus, measuring the egress rate from the source, teaches the recited “monitoring ingress rates,” as recited in the claims (Pet. Reply 17–19). We are not persuaded the egress rate from one device is the same as the

ingress rate to another device. Indeed, we are not persuaded an ordinarily skilled artisan, as articulated by Petitioner, would understand an egress rate to teach an ingress rate given the known issues of transmission. Indeed, although Petitioner provides an analogy to water entering a garden hose and existing at the same rate, regardless of length (Pet. Reply. 18; Tr. 23), we are not persuaded. The example cited by Petitioner in Feng to support their assertion, is of “a *simulation with fixed* 10ms transmission delay between node pairs” (Pet. Reply 19 (emphasis added)).

Further, Petitioner asserts “packet loss on a transmission line between *adjacent nodes* is so negligible as to have no effect on the average data rates monitored in Feng and the ’848 patent” (*id.* at 19 (citing Ex. 1045 ¶ 19; Ex. 2001, 151:13–152:6) (emphasis added)). We are unpersuaded.

First, nothing in the term “egress rate” and “ingress rate” requires they be from “adjacent nodes.” Second, nodes, even adjacent nodes, may be quite far apart, thereby introducing transmission loss. Nothing in the terms “egress rate” or “ingress rate” limits the distance or different devices between them and therefore, packet loss can be introduced. That Petitioner identifies one example in which the difference in rate is “negligible” does not show that it will always be the case. In particular, if a flow has an egress rate at one device and ingress rate at another, with routers in between as shown in Feng, we are not persuaded the rates would be equal. Indeed, we credit Dr. Melendez’s testimony that a router “changes” packets as they go through them (Ex. 1041, 76) and “in a real network you would have lost packets and/or dropped packets” (*id.* at 81).

Petitioner states in its Petition “Feng discloses a simulation of *virtual* routers that ran multiple flows through a network of five nodes . . . Figure 1. [Ex. 1002] ¶¶ 165–167, Feng, p. 282 (explaining observations from the experiments have to do with ‘a lower probability of losing a packet at the routers’)” (Pet. 26). Thus,

Petitioner admits Feng is disclosing a simulation. Petitioner further admits that Feng's experiment "*assumes zero packet loss between nodes*" and quotes Patent Owner's declarant that "[H]e is monitoring the transmission line. . . as having a fixed delay and no loss, *because he is not worried about addressing line loss*" (Pet. Reply 20 (citing Ex. 1041, 157:11–21, 160:12–17 (emphases added))).

Petitioner additionally contends "As [Patent Owner's] expert agreed, this monitoring technique is only capable of reflecting an average data rate, and cannot measure instantaneous rates" and therefore, the rate measure would not be affected by transmission line characteristics or "by monitoring at the transmitting vs. receiving end of a connection between adjacent nodes" (Pet. Reply 18).

These assertions, however, do not persuade us. Feng describes a simulation. Moreover, we are unpersuaded even an average data rate would not be affected by transmission line characteristics because each measured data rate to be averaged, would be affected by transmission line characteristics.

Petitioner further asserts Patent Owner's expert "advanced a new argument [at his deposition] . . . that egress rate at one node may differ from ingress rate at the next node due to 'loss of a packet on the transmission line'" (Pet. Reply 19). We do not find this to be a "new argument"; instead, we credit this testimony and find this to be a further explanation as to why an egress rate is not the same as an ingress rate, which Patent Owner argued in its Response.

Therefore, we are not persuaded an egress rate from a device is equal to an ingress rate to a different device.

Packets passing from an ingress port to an output queue:

The claim limitation additionally recites "each flow including a plurality of packets passing from an ingress port to an output queue" (Ex. 1001, Claims).

Patent Owner asserts Feng fails to teach “monitoring . . . between the ingress port and the output queue” (PO Resp. 6–7 (citing Ex. 2001 ¶ 40)). Patent Owner asserts Feng’s “source of the packet flow (i.e., the transmitting device) is associating itself with the traffic envelope” which Petitioner’s contends teaches “monitoring of the packets” (*id.* at 8). However, according to Patent Owner, “this monitoring is not monitoring of packets that are passing between an ingress port and an output queue” (*id.* (citing Ex. 2001 ¶ 42; ’848 Patent, 6:36–57)).

Petitioner argues “[n]othing in the claims requires the ‘ingress port’ and ‘output queue’ to be in the same device” or “excludes the claimed method from being performed in a data network formed collectively by intranet and Internet networks connected together” (Pet. Reply at 12 (citing Ex. 1041, 133:5–35:4, 20:15–19, 125:16–22; Ex. 1045 ¶ 5)). Additionally, Petitioner asserts Patent Owner is taking a position inconsistent with Patent Owner’s litigation position regarding interpretation of the phrase “monitoring ingress rates of a plurality of flows” (Pet. 8–9, n2). We do not determine Patent Owner’s position to be inconsistent as the term “ingress rate” was not construed in the district court litigation. Patent Owner asserts “one skilled in the art would understand that the claim requires monitoring the ingress rate at the ingress port, output queue or between the ingress port and the output queue” (PO Resp. 8).

In the ’848 Patent, as shown in the data flow diagram of Figure 1, flows F1–F9 pass through data channels C1–C3 to Monitors M1–M3 (Ex. 1001, 3:65–4:3, 8–12). The traffic monitors M1–M3 pass the data to switch S, which in turn passes the data to designated queues Q1–Q3 (*id.* at 4:1–3, 8–12).

A traffic monitor, illustrated in Figure 3, “includes an ingress monitor for each flow associated with the channel” (*id.* at 4:38–40). The ’848 Patent does not specifically identify where the ingress port is (*see generally* ’848 Patent).

Nonetheless, the '848 Patent describes an ingress monitor having a leaky-bucket model with characteristic parameters including a flow increment I, a leak rate R, and a level L ('848 Patent, 4:45–49, Fig. 3). The ingress monitor may also “measure a number of flow characteristics including not only the average data rate but also the burst rate and the burst length” (*id.* at 4:53–54).

Based on the presented evidence and the approach for claim construction under Phillips and the description of the monitoring by the ingress monitor, in the Specification of the '848 Patent, we find an ordinarily skilled artisan would understand monitoring the ingress rate to be the rate determined by the ingress monitor of a flow entering through the ingress port.

Feng’s monitoring at the source fails to teach “monitoring the ingress rate”:

Patent Owner next argues “Feng only discloses monitoring of the packets at the source (prior to the packet entering the network)” and specifically,

this method of token generation and monitoring occurs only at the source of the data that is generating and transmitting the data to the network, it does not occur between an ingress port and an output queue of the data network, but in a source device in which the data does not traverse an ingress port

(*id.* at 9–10). Patent Owner further argues Feng monitors “the output rate of a transmitting device, rather than the ingress rate of a flow into a device” (PO Resp. 11). According to Patent Owner, unlike the '848 Patent which utilizes a leaky-bucket method “to measure characteristics of the incoming packets before other actions are taken on the packets” (citing '848 Patent, 4:45–59), “Feng monitors the data traffic as it is transmitted to (injected into) the network (as the packet[s] egress from the source)” (PO Resp. 11–12 (quoting Feng, 280)).

Petitioner asserts the claim language does not recite *where* the monitoring takes place; rather, according to Petitioner the claim only recites the flow passes

from an ingress port to an output queue, but does not limit the flow from passing through other locations (Pet. Reply 3 (citing Ex. 1041, 128:17–22)). Thus, Petitioner argues “monitoring a characteristic (*e.g.*, ingress rate) of a flow can be done at any location” (*id.* at 4).

Moreover, Petitioner argues, Feng teaches the limitation especially given Plaintiff’s construction in district court for “monitoring ingress rates of a plurality of flows” — “[p]lain and ordinary meaning; *or* observing the number of packets or data rates for particular flows” (Pet. Reply 8 (quoting Ex. 1040, 3)).

Feng teaches:

In order to police traffic ***at the source***, we use token buckets. The token generation process follows the Tspec advertised by the source. That is, the long-term average rate of token generation is tm , the short-term peak rate of token generation is tp , and the depth of the token bucket is b . Each time a packet is injected into the network, if sufficient tokens are available, an equivalent number of tokens are considered consumed. If there aren't enough tokens present at the time of transmission, the packet is treated as non-conformant.

In addition to policing, we also propose to mark packets ***at the network entry point***. Conformant controlled-load traffic is marked before being injected into the network. Non-conformant controlled-load traffic and best-effort traffic is injected into the network unmarked

(Feng, 280 (emphases added)). Feng’s disclosure of monitoring traffic at the source, however, does not teach the recited “monitoring ingress rates of a plurality of flows.” As set forth above, we determine the ingress rate is the rate entering the ingress monitor, not the rate of data exiting from a device. Thus, we are not persuaded monitoring the egress rate from Feng’s source teaches monitoring ingress rates. Indeed, this disclosure of Feng teaches creating a flow at a source and measuring the egress rate from the source.

Feng’s monitoring at the boundary fails to teach “monitoring the ingress rate”:

Petitioner additionally relies on Feng’s teaching (Pet 26–27) that “Connections are monitored and policed at the network entry points. This could be either at the source, or at the boundary *between the corporate or campus intranet and the Internet*” (Feng, 280 (emphasis added)).

We are not persuaded this disclosure meets the claim limitation. Specifically, Feng describes monitoring the egress rate from a source or before being injected into another network. In its Abstract, Feng describes the proposed approach — “We propose minor extensions to the packet queueing and discard mechanisms used in routers, coupled with simple control mechanisms *at the source* that enable the network to guarantee minimal levels of throughput to different network sessions while sharing the residual network capacity in a cooperative manner” (*id.* at 279 (emphasis added)). Moreover, in its Introduction, Feng teaches: “Traffic is policed *at the source* and packets conforming to the envelope are marked” (*id.* at 279 (emphasis added)). Feng further teaches “in order to police traffic *at the source*, we use token buckets” and “[i]n addition to policing, we also propose to mark packets at the *network entry point*” (*id.* (emphasis added)). Moreover, Feng teaches at the *source*, a token generation process follows a traffic envelope *Tspec* (Feng, 280 (emphasis added)). Thus, Feng teaches monitoring at the source or a network entry point.

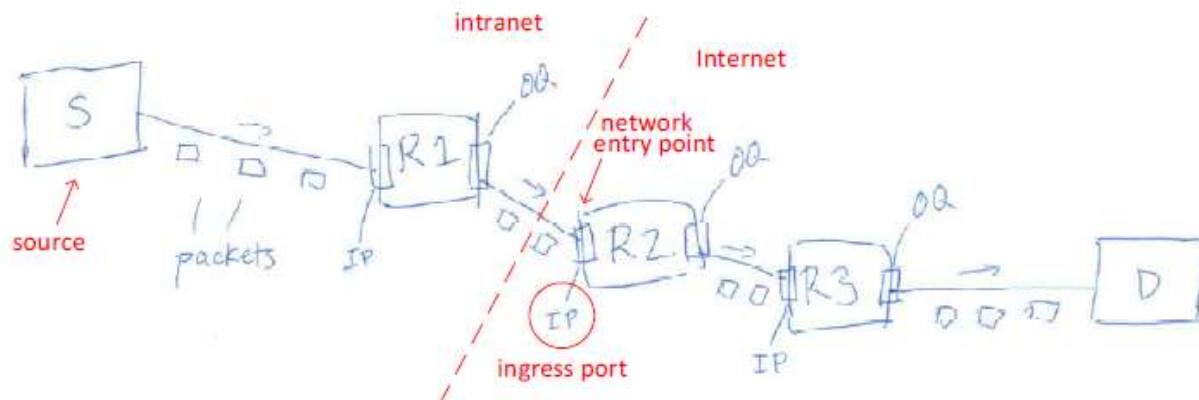
Relying on Feng’s disclosure that the network entry point may be at the boundary between an intranet and the Internet, Petitioner contends “[t]he boundary between an intranet and the Internet commonly has a router on each side; in the example of [Exhibit] 1039 (annotated below), these could be routers ‘R1’ and ‘R2’” (Pet. Reply 10–11 (citing Ex. 1045 ¶ 3; Ex. 1041, 46:9–48:17; Ex. 1042, 318–319)). Petitioner argues “[n]othing in the claims requires the ‘ingress port’

and ‘output queue’ to be in the same device” or “being performed in a data network formed collectively by intranet and Internet networks connected together” (*id.* at 12 (citing Ex. 1041, 33:5–35:4, 120:15–19, 125:16–22; Ex. 1045 ¶ 5)).

Thus, Petitioner contends:

a [person of ordinary skill in the art] would have understood that by monitoring a flow “at the boundary between the . . . intranet and the Internet,” Feng monitors at a location between (at least one) ingress port in the intranet and (at least one) output queue in the Internet—for example, between an intranet edge router’s ingress port (*e.g.*, the “IP” of router “R1” . . .) and an Internet edge router’s output queue (*e.g.*, the “OQ” of router “R2” . . .)

(Pet. Reply 11). Petitioner further contends “A [person of ordinary skill in the art] would thus have understood that monitoring ‘at the boundary between the . . . intranet and the Internet’ includes the limited possibilities of monitoring at R1 or R2” (*id.* at 14–15). Petitioner’s annotated drawing of packets moving from a source to a device, is reproduced below:



(*id.* at 10–11, 15). The reproduced annotated drawing illustrates packets moving from a source to a device through routers R1, R2, and R3 (*id.*). Thus, Petitioner asserts an ordinarily skilled artisan would have found “readily apparent and

obvious” given Feng’s teaching of an entry point to the Internet network, a “choice of monitoring the entry rate to R2 (*e.g.*, at the ingress port ‘IP’ circled in red [above]” (*id.* at 15 (citing Ex. 1045 ¶¶ 7–9)).

Petitioner does not provide any reasoning as to why an ordinarily skilled artisan would have found it obvious to monitor the entry rate to R2 in light of Feng’s teachings. Patent Owner contends that although Feng describes the connections could be monitored “at the boundary between the corporate or campus intranet and the Internet (PO Resp. 12 (quoting Feng, 280)), “Feng is silent regarding how the monitoring would be accomplished at this boundary” or why “monitoring at the boundary would be done on the ingress rate rather than the egress rate of the boundary device” (*id.*). Moreover, Patent Owner asserts “real world practical differences” exist “between monitoring an ingress rate of a receiving device (at the network) and monitoring an egress rate at the transmitting device” (*id.*).

As set forth above, we agree with Patent Owner that monitoring an ingress rate would be different than monitoring an egress rate. We credit Dr. Melendez’s testimony that if you monitor a rate “at R1 or . . . somewhere down the road, those packets may get lost, and so it is not meaningful to say, I am going to monitor the ingress rate at R2 by monitoring the egress rate at R1” (Ex. 1041, 133:1–5). Feng does not describe what a network entry point would be, nor does Feng provide any disclosure of determining any rate entering a router; rather Feng teaches monitoring of an egress rate (*see generally* Feng).

Petitioner further argues Feng discloses “each router (node) would have at least one ‘ingress port’ and discloses at least one ‘output queue’ per router” (Pet. 29, 24). Petitioner asserts if Patent Owner is arguing an edge router is not part of a network, Patent Owner’s expert “refuted that assertion by testifying that packets

from an intranet enter the Internet at a ‘router *in* the Internet’ [(network)]” (Pet. Reply 16 (citing Ex. 1045, 47:24–48:9, 44:8–11)). Additionally, Petitioners argue, “Feng monitors and marks flows *before* any router can drop packets based on the markings” (*id.* (citing Ex. 1045 ¶¶ 10–11)).

We agree with Petitioner’s assertion that Feng teaches monitoring at a network entry point and that the network entry point may be at the boundary between the Internet and an intranet. Although we are persuaded a network entry point could be a router, Petitioner has not explained why an ordinarily skilled artisan would have found it obvious to modify Feng’s teaching, which is focused on monitoring and policing egress rates to monitoring and policing an ingress rate. Feng discloses connections are monitored and policed at the *network entry points* which may be at “the boundary *between the corporate or campus intranet and the Internet*” (Feng, 280). Thus, even monitoring at the boundary is at a network entry point. Moreover, as set forth by Patent Owner, Feng discusses policing packets at the time packets are *injected into the network* by the source of the packets (PO Sur-Reply 4 (citing Feng, 280) (emphasis added)). Specifically, Feng teaches:

In addition to policing, we also propose to mark packets ***at the network entry point***. Conformant controlled-load traffic is marked ***before being injected into the network***. Non-conformant controlled-load traffic and best-effort traffic is injected into the network unmarked

(Feng, 280 (emphases added)).

Petitioner’s arguments are focused on the egress rate being equivalent to the ingress rate and in particular, the egress rate from R1 being the same as the ingress rate to R2 (Pet. Reply 16–18). As set forth above, however, that cannot always be said. Again, we are not persuaded these rates are always the same and that errors in data transmission will never occur. Additionally, Feng is directed toward “simple control mechanisms at the source” (Feng, 279, Abstract, Introduction).

Feng further describes monitoring and policing at the boundary or network *entry* point (*id.* at 280). Thus, we determine Feng teaches monitoring the egress rate. Moreover, Petitioner has failed to show that an ordinarily skilled artisan would have found it obvious to modify Feng’s teaching of monitoring an egress rate from a device in one network to monitor ingress rate of a different device in a second network.

Based on the record before us, Petitioner has not shown Feng’s teaching of monitoring and policing connections at a network entry point such as a boundary between the corporate or campus intranet and the Internet, monitors the ingress rate as recited in claims 1 and 15. Accordingly, based on the evidence before us, Petitioner has not shown the relied upon references teach the disputed limitation, as recited in claims 1 and 15.

b) Conclusion as to Claims 1 and 15

In summary, we find Feng fails to teach the “monitoring ingress rates of a plurality of flows” limitation. Having considered the full record developed during trial, we conclude Petitioner has failed to show, by a preponderance of the evidence, that the subject matter of claims 1 and 15 would have been obvious under 35 U.S.C. § 103(a) based on Feng, Alleged Admitted Prior Art, and Floyd.

2. Claims 4, 5, 8–10, 12–19, and 21–23

Claims 4, 5, 8–10, and 12–14 depend from independent claim 1 and claims 16–19 and 21–23 depend from independent claim 15 (’828 Patent, Claims). Although Petitioner has set forth with specificity, how each of the claims is taught by the combination of Feng, AAPA, and Lloyd (Pet. 42–52), because of their dependence on the independent claims 1 and 15, as discussed above, we find

Petitioner has not shown the combination of Feng, AAPA, and Lloyd teaches or suggests claims 4, 5, 8–10, 12–19, and 21–23.

3. Conclusion

Having considered the full record developed during trial, we conclude Petitioner has failed to show, by a preponderance of the evidence, that the subject matter of claims 1, 4, 5, 8–10, 12–19, and 21–23 would have been obvious under 35 U.S.C. § 103(a) over the combination of Feng, Patent Owner’s Admitted Prior Art, and Floyd.

F. Asserted Obviousness over Feng, Alleged Admitted Prior Art, Lloyd, and Ferguson: claims 11, 20, and 24–31

Petitioner contends the combination of Feng, Admitted Prior Art, Lloyd and Ferguson teaches claims 11, 20, and 24–31 (Pet. 13–52). Claim 11 depends from claim 1 and claim 20 depends from claim 15 (’828 Patent, Claims). Therefore, for the reasons set forth above, Petitioner has not shown the combination of Feng, AAPA, Lloyd, and Ferguson teach the subject matter of claims 11 and 20.

Claim 24 is an independent claim and claims 25–31 depend from claim 24. Claim 24 includes the limitations of claim 15 and the additional limitation of “the plurality of drop functions including functions identified for ‘low marking,’ ‘normal marking,’ and ‘high marking’” (’848 Patent, Claims). For the reasons set forth with respect to claims 1 and 15, Petitioner has not shown Feng, AAPA, and Lloyd teaches “monitoring ingress rates of a plurality of flows, each flow including a plurality of packets passing from an ingress port to an output queue, each flow having a profile related to flow characteristics,” as recited in claims 1 and 15. Petitioner does not rely on Ferguson to teach this limitation (Pet. 54).

Accordingly, we find the combination of Feng, AAPA, Lloyd, and Ferguson fails to teach the subject matter of independent claim 24 and claims 25–31 which depend therefrom.

Having considered the full record developed during trial, we conclude Petitioner has failed to show, by a preponderance of the evidence, that the subject matter of claims 11, 20, and 24–31 would have been obvious under 35 U.S.C. § 103(a) over the combination of Feng, Patent Owner’s Admitted Prior Art, Floyd, and Ferguson.

IV. MOTION TO STRIKE

Petitioner requests that Patent Owner’s entire Sur-Reply be struck because it contains allegedly new arguments (Paper 27, 1, 4; *see* Update to the Trial Practice Guide (83 Fed. Reg. 38,989 (Aug. 13, 2018) (notifying the public of the updated “Trial Practice Guide” and its accessibility through the USPTO website: <https://go.usa.gov/xU7GP>)) at 15 (a “sur-reply that raises a new issue or belatedly presents evidence may not be considered”; a sur-reply may “respond” to arguments “raised” in the reply but “respond ... does not mean embark in a new direction with a new approach as compared to positions taken in a prior filing.”)).

In particular, Petitioner contends Patent Owner’s Sur-Reply shifts to a new claim interpretation by limiting ingress rate to the rate of ingress into the ingress port in contrast to its interpretation in the Patent Owner’s Response which “requires monitoring the ingress rate ***at the ingress port, output queue, or between the ingress port and the output queue***” (*id.* at 1–2). We are not persuaded that Patent Owner shifted interpretation. Rather, all these locations are at the ingress monitor. Moreover, Patent Owner (PO Sur-Reply 3) was responding to Petitioner’s argument that while Petitioner’s “proposed packets must be measured

‘passing through an ingress port,’ [Patent Owner’s] proposed interpretation of the ‘monitoring’ limitation included ***no location requirement***” (Pet. Reply 8–9).

Petitioner further contends Patent Owner’s Sur-Reply raises three new arguments regarding Feng that have no support in the Patent Owner’s Response (Paper 27, 3). With respect to the argument that Feng’s network entry point being a member of both networks simultaneously, we determine this is in response to Petitioner’s argument asserted in the Petitioner Reply that a router could be an edge router and that the “ingress port” and “output queue” being in the same device (Pet. 11). Nevertheless, this argument was not relied upon in reaching our determination.

We additionally do not find Petitioner’s argument that Patent Owner’s contention that “Feng’s ‘monitoring . . . would occur in a router that could drop the packets before they are injected into a network’” is a new argument (Paper 27, 3). Rather, we determine this is responding to Petitioner’s contention that the egress rate of one device equals the ingress rate at another.

Similarly, Petitioner’s assertion that identifying Feng’s discussion as describing simulations and not “real world implementation” is a new argument (Paper 27, 4) is unpersuasive as again, this responds to Petitioner’s contention that the egress rate of one device equals the ingress rate at another.

Accordingly, Petitioner’s motion is denied.

V. CONCLUSION

For the reasons discussed above, we determine Petitioner has not proven, by a preponderance of the evidence, that claims 1, 4, 5, 8–10, 12–19, and 21–23 would have been obvious under 35 U.S.C. § 103(a) over the combination of Feng, Patent Owner’s Admitted Prior Art, and Floyd and that claims 11, 20, and 24–31

would have been obvious under 35 U.S.C. § 103(a) over the combination of Feng, Patent Owner's Admitted Prior Art, Floyd, and Ferguson.

VI. DECISION

Accordingly, it is:

ORDERED that claims 1, 4, 5, and 8–31 of U.S. Patent No. 6,252,848 have not been shown to be unpatentable; and

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

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