

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC. and TELEFONAKTIEBOLAGET LM ERICSSON,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Case IPR2015-01872
Patent 7,385,994 B2

Before BRYAN F. MOORE, BRIAN J. McNAMARA,
and DAVID C. McKONE, *Administrative Patent Judges*.

McKONE, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Ericsson Inc. and Telefonaktiebolaget LM Ericsson (collectively “Petitioner”) filed a Petition (Paper 2, “Pet.”) to institute an *inter partes* review of claims 1–25 of U.S. Patent No. 7,385,994 B2 (Ex. 1001, “the ’994 patent”). Intellectual Ventures II LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”). Pursuant to 35 U.S.C. § 314, in our Decision to Institute (Paper 10, “Dec.”), we instituted this proceeding as to claims 1–4, 7, 11–14, 17, and 20–25, but not claims 5, 6, 8–10, 15, 16, 18, and 19.

Patent Owner filed a Patent Owner’s Response (Paper 18, “PO Resp.”), and Petitioner filed a Reply to the Patent Owner’s Response (Paper 21, “Reply”).

Petitioner relies on the testimony of Mark R. Lanning (Ex. 1006, “Lanning Decl.”). Patent Owner relies on the testimony of Tim A. Williams, Ph.D. (Ex. 2013, “Williams Decl.”).

An oral argument was held on December 8, 2016 (Paper 28, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is a final written decision under 35 U.S.C. § 318(a) as to the patentability of the challenged claims. Based on the record before us, Petitioner has not demonstrated, by a preponderance of the evidence, that any claim of the ’994 patent is unpatentable.

B. Related Matters

The '994 patent is the subject of several lawsuits in the United States District Court for the District of Delaware. Pet. 1; Paper 5, 1–2.

The '994 patent also was the subject of *Ericsson Inc. v. Intellectual Ventures II LLC*, Case IPR2014-01170 (PTAB). In that proceeding, the Board declined to institute an *inter partes* review. Ex. 1005.

C. References Relied Upon

U.S. Patent No. 6,480,911 B1, issued Nov. 12, 2002 (Ex. 1002, “Lu”);
and

U.S. Publication No. 2002/0183066 A1, published Dec. 5, 2002
(Ex. 1003, “Pankaj”).

D. The Instituted Grounds

We instituted *inter partes* review based on the following specific grounds (Dec. 40–41):

Reference(s)	Basis	Claim(s) Challenged
Lu	§ 103(a)	1–4, 7, 11–14, 17, 20, 21, 23, and 24,
Lu and Pankaj	§ 103(a)	22 and 25

E. The '994 Patent

The '994 patent describes gateway queuing algorithms in packet networks. Ex. 1001, 1:5–9. The data packets are queued according to tiers

and a communication resource is made available on a tier-by-tier basis.

Id. at Abstract. Figure 2, reproduced below, illustrates an example:

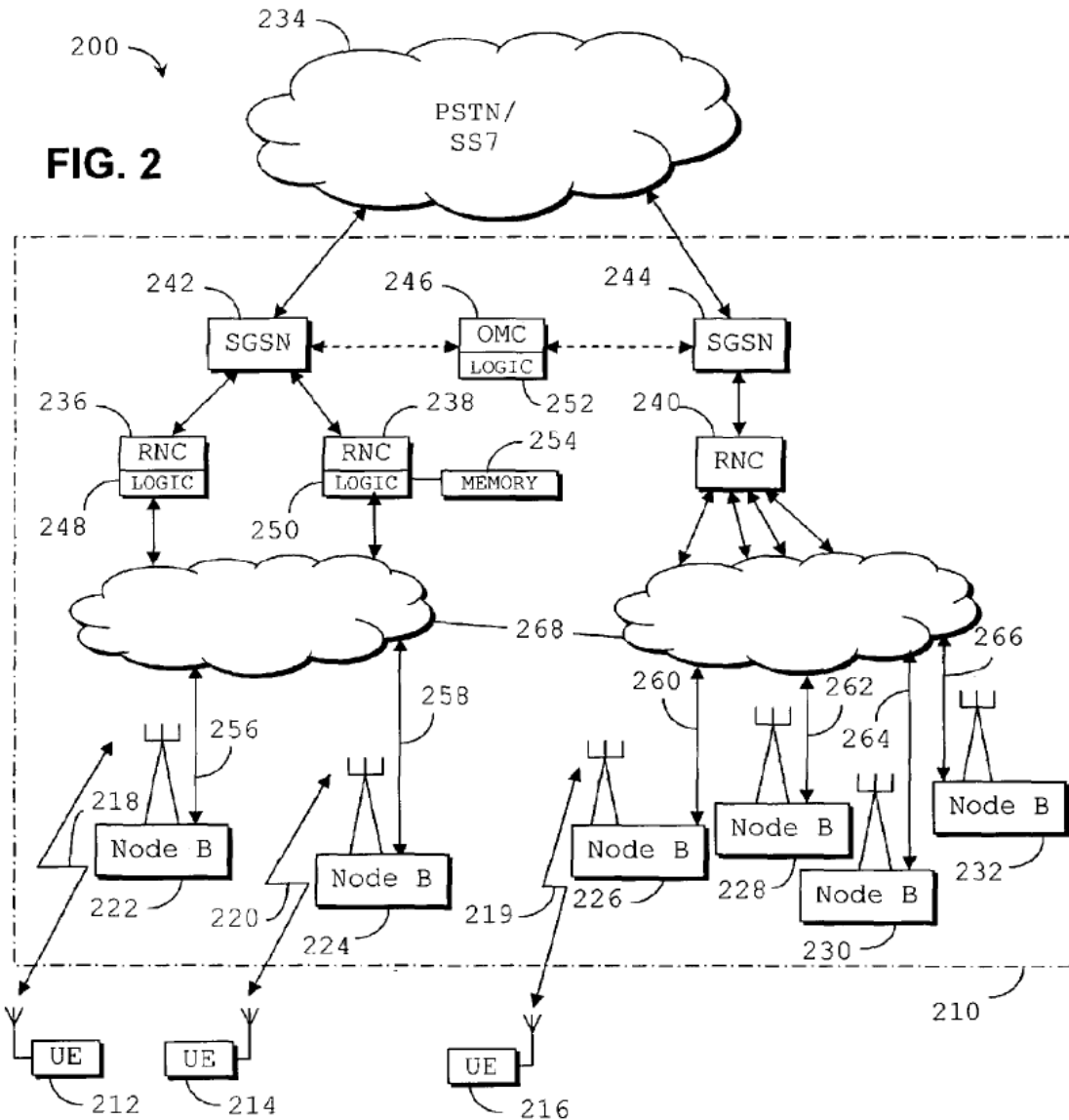


Figure 2 is a block diagram of a wireless communication system. *Id.* at 5:8–10.

The following acronyms are helpful in understanding the description of Figure 2, as well as other portions of this discussion:

3GPP - Third Generation Partnership Project;
CDMA - code division multiple access;
ETSI - European Telecommunication Standards Institute;
GGSN - gateway GPRS support node;
GPRS - General Packet Radio Service;
GSM - Global System for Mobile Communication;
MS - mobile station;
MSC - mobile switching centre;
PSTN - public switched telephone network;
RNC - radio network controller;
TDMA - time-division multiple access;
UE - user equipment;
UMTS - universal mobile telecommunication system;
UTRAN - UMTS Terrestrial Radio Access Network;
WCDMA - Wideband CDMA.

Cellular-based telecommunication system 200 is described in terms of a UMTS system, in particular a system that complies with the 3GPP specification for WCDMA. *Id.* at 5:21–30. As shown in Figure 2, system 200 includes a plurality of subscriber terminals (e.g., cellular telephones, also referred to as MS or UE) 212, 214, 216 communicating over radio links 218, 219, 220 with base transceiver stations (also called Node-Bs) 222, 224, 226, 228, 230. *Id.* at 31–37. The Node-Bs are connected to external network 234 (e.g., the Internet), through base station controllers (also called RNCs) 236, 238, 240 and, in turn through MSC 242 and SGSN 244. *Id.* at 5:61–67.

RNCs 236, 238, 240 include processing elements 248 adapted to facilitate packet data queuing and scheduling. *Id.* at 6:14–18. RNCs 236, 238, 240 implement an algorithm to schedule queued packet data transmissions. *Id.* at 6:18–22. Allocation of a shared resource is made at certain time intervals, or rounds. *Id.* at 6:29–32. In one example, users

compete to send 1 kbit data packets over a 10 Mbps link in 10 msec rounds, in which 100 packets are allocated each round. *Id.* at 6:32–37. The resource is allocated in tiers. In a two-tier system, for example, 75 percent of the resource might be allocated to a higher tier while 25 percent is allocated to the lower tier. *Id.* at 6:46–55. The relative proportions of system bandwidth can be allocated using weights defined for each tier. *Id.* at 6:59–63.

Bandwidth can be allocated on a user-by-user basis. Figure 3, reproduced below, illustrates an example:

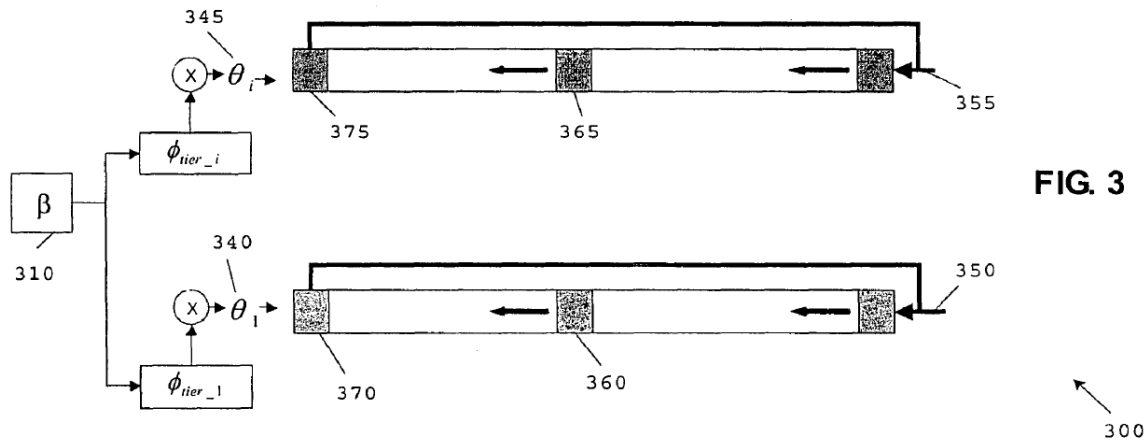


Figure 3 is a flowchart/functional block diagram of packet data processing operation 300. *Id.* at 5:11–13.

Each user can be provided with an identification code, which identifies the user and indicates the amount of data the user wishes to transfer. *Id.* at 7:26–28. When the user enters into the packet data scheme, the user's ID is placed at the tail of the queue corresponding to the user's tier of service. *Id.* at 7:29–32. For example, the user's ID can be placed at tail 355 of the i^{th} queue or tail 350 of the lowest tier queue. *Id.* The packets of user data are stored separately from the user ID queues. *Id.* at 7:32.

Within each tier, packets are allocated in a round-robin fashion, in which a number γ of packets is assigned to the user corresponding to the first ID in the queue for that tier (e.g., the ID at head 375 of the i^{th} tier queue). *Id.* at 7:52–54. Once that user has transmitted γ packets, the user's ID is placed at the tail of the queue (location 355) and the remaining user IDs are moved up in the queue (e.g., from location 355, through intermediate location 365, to head location 375 of the i^{th} queue). *Id.* at 7:60–65. This process is repeated until a total number of packets allocated to this tier for this round has been allocated to users. *Id.* at 8:65–67. This process is then repeated for each of the other tiers, down to the lowest tier, and started anew the next round. *Id.* at 8:1–19.

Claim 1, reproduced below (bracketed letters added to track the parties' designations of claim elements), is illustrative of the claimed subject matter:

1. A method of processing queued data packets in a packet data communication system, the method comprising:
 - [a] allocating a tier of service for each of a plurality of individual packet data queues, wherein allocating a tier of service comprises:
 - [b] determining a total number of data packets that can use an available communication resource;
 - [c] allocating different weights to each tier of service based on a number of users requiring access to the available communication resource;
 - [d] allocating a proportion of said total number of data packets to a number of the tiers of service to allow individual packet data queues on a number of tiers to share a communication resource; and

[e] providing said communication resource to queued packet data users on a tier-by-tier basis, such that said communication resource is made available to a number of tiers.

II. ANALYSIS

A. Claim Construction

We interpret claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2155–56 (2016). Claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

1. Means-plus-function Terms

Claims 11–14 and 17 recite several terms in means-plus-function format. Claim 24 recites several terms in the form of “logic for” performing the functions of parallel terms recited in claim 11. In the Institution Decision, we adopted Petitioner’s proposed constructions, set forth at pages 10–15 of the Petition, as our constructions for the means-plus-function terms of claims 11–14 and 17. Dec. 17–18. We also determined to treat the “logic for” terms of claim 24 as means-plus-function terms, *see Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015), and adopted Petitioner’s statement of the structure corresponding to the “logic for” terms

(Pet. 10–13). *Id.* at 18. Patent Owner does not dispute these constructions. PO Resp. 8. On the complete record, we maintain these constructions.

2. “*queued packet data users*”

Claim 1 recites “providing said communication resource to *queued packet data users* on a tier-by-tier basis, such that said communication resource is made available to a number of tiers.” Claim 11 recites “scheduling means to provide said communication resource to *queued packet data users* on a tier-by-tier basis, such that said resource is made available to all tiers.” Claim 24 recites “scheduling logic for providing said communication resource to *queued packet data users* on a tier-by-tier, such that said resource is made available to all tiers.” Neither party proposes an express construction of “*queued packet data users*.” Nevertheless, the parties’ respective applications of this term make clear that its meaning is in dispute. Tr. 5:7–10, 41:1–4.

Petitioner contends that Lu’s description of placing packets into queues teaches this limitation. Pet. 34; Reply 8–9. In other words, Petitioner contends that “*queued*” modifies “*packet data*” and that the “*users*” are users of *queued packet data*. Tr. 17:13–15, 50:19–51:6. Patent Owner, on the other hand, argues that Lu does not teach queuing users. PO Resp. 23–24. According to Patent Owner, “[t]he term ‘*queued*’ plainly modifies the term ‘*packet data users*’ in claim 1, not merely the term ‘*packet data*.’ That is, the users are users of packet data, and the users are *queued*.” *Id.* at 24.

The term “queued packet data users,” by itself, reasonably can be read as “users of queued packet data,” as proposed by Petitioner, and “queued users of packet data,” as proposed by Patent Owner. Thus, the language of the term itself does not plainly support either party.

The parties each proffer additional language in the claims to support their respective positions. As the Federal Circuit has stated, “the context in which a term is used in the asserted claim can be highly instructive.”

Phillips v. AWH Corp., 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc). At the oral argument, Petitioner argued that the preamble of each independent claim supports its position. Tr. 50:19–51:6. Specifically, claim 1 recites “[a] method of processing queued data packets,” which suggests that the later recitation of “queued packet data users” means users of queued packet data, rather than queued users of packet data. Similarly, claim 11 recites “[a] packet data scheduler queuing data packets” and claim 24 recites “[a] packet data communication system operable for processing queued data packets.”

For its part, Patent Owner argues that “queued packet data users” must mean queued users of packet data if claim 1 is to be reconciled with its dependent claims 5 and 7. PO Resp. 24, 26–27. Claim 5 recites “providing *a packet data user* with an identification code to assist in the tier allocation.” Patent Owner argues that the recitation “a packet data user” in claim 5

supports the notion that users are queued.¹ *Id.* at 24. At the oral hearing, Petitioner countered that, per the doctrine of claim differentiation, claim 1 must be broader than claim 5 and, thus, claim 1 does not require queuing an identification code. Tr. 18:4–13, 20:1–8. Claim 5 continues, however, “wherein, the identification code provides at least one of the group consisting of: an identifier for the user and an indication of a number of data packets that the user wishes to transfer.” Thus, a presumption of claim differentiation is not appropriate because, even if claim 1 requires queuing an identification code, claim 5 still would be narrower.

Claim 7 adds to claim 1 “placing a user at a tail of an allocated queue, depending on the user[']s tier of service when said user provides data packets for queuing.” This is a positive recitation of queuing users, rather than data packets. We note that claim 8 also provides relevant context. It depends from claim 1 and recites “allocating data packets to a user at a head of the tier queue” and “moving said user at said head of the tier queue to the tail of the queue when the user’s data packets have been sent.” These recitations further support the notion that claim 1 is directed to queueing users. Indeed, the most logical reading of the claims together is that claim 1 refers to users of packet data that are queued (e.g., by virtue of queued user identifications, per claim 5) and that users at the head of a queue are allocated data packets (claim 8) and are moved to the tail of the queue after

¹ By queueing users, we mean queuing some indication of a user, for example the “identification code” recited in claim 5 and recited in the Specification, and we understand Patent Owner to be arguing the same. Ex. 1001, 7:26–32; *see also* Ex. 1017 (Williams Dep.), 91:16–19.

the allocated data packets are sent (claims 7 and 8). Claims 7 and 8, in particular, make little sense if claim 1 recites queuing the data packets themselves, rather than the users of those packet data.

Although it does not use the precise term “queued packet data users” (and, thus, does not expressly define the term), in this case, the Specification points to the correct reading of the term and reconciles the recitations of claims 1, 5, 7, and 8. As the Federal Circuit has stated, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (internal quotation marks omitted). That is the case here.

Patent Owner points us to the Specification’s description of Figure 3, summarized above. PO Resp. 5–8, 24. Consistent with Patent Owner’s position, the Specification describes:

Preferably, each user is provided with an identification (ID) code, which provides an identifier for the user and an indication of the amount of the data the user wishes to transfer. When a user is entered onto the packet data scheme, the user’s ID is placed at the tail of the appropriate queue, depending on the tier of service, for example tail 355 of the i^{th} tier, or tail 350 of the lowest tier. Note that the user data is stored separately.

Ex. 1001, 7:26–32. Similarly, the Specification states:

Within each tier, packets are then allocated in a round-robin fashion in the following manner. γ packets are allocated to the user whose ID is at the head 375 of the tier queue. γ is selected offline as a value that defines the number of packets that can be allocated to a user when at the head of the tier queue. . . .

When these γ packets have been allocated the user ID at the head of the tier queue 375 is sent to the tail of the queue 355,

and the queue moved along. Hence, the users move from the tail of the queue at location 355, through an intermediate location at 365 to the head of the queue at location 375, and then back to the tail of the queue at location 355. This process is repeated until a total of θ packets 345 have been allocated in this tier.

Id. at 7:52–67. The Specification refers to this as “an improved packet data queuing algorithm.” *Id.* at 9:3.

In this example, identification codes corresponding to users of packet data are queued in a set of queues according to a tier assigned to the user. The packets themselves are stored elsewhere. Within a particular queue, when the identifier for a particular user is at the head of the queue, a number of packets are transferred from the separate storage on behalf of the user. This is consistent with “providing a packet data user with an identification code to assist in the tier allocation” as recited in claim 5. It is also consistent with “allocating data packets to a user at a head of the tier queue,” as recited in claim 8. After the number of packets are transmitted, the user’s ID is moved to the tail of the queue. This is consistent with “placing a user at a tail of an allocated queue, depending on the user[’]s tier of service when said user provides data packets for queueing,” as recited in claim 7.

In short, the examples in the Specification are consistent with a technique in which user identifications are stored in queues according to the tiers that have been assigned to the respective users. Although the Specification describes the invention broadly as a packet data queuing algorithm, the packets themselves are stored elsewhere in a manner that is not described in detail. Rather, the packets are queued, if at all, by virtue of

their associations with the user identifications, which are stored in the queues specifically described in the Specification.

Petitioner points to no disclosure in the Specification of queueing packets. Petitioner concedes that the embodiment of Figure 3 is described as storing user IDs, rather than the corresponding packets, in the queues.

Tr. 19:7–10 (“I think in that particular example in Figure 3 they are queueing -- you are correct, they are queueing the user identification, and the data itself is referenced and stored separate in memory in that particular example.”). Nevertheless, Petitioner argues that the Specification, at column 7, lines 45–49, describes queueing packets. *Id.* at 19:11–16. The passage cited by Petitioner reads: “The total number of data packets that can be allocated in a single round, β_{310} , can then be determined. Assuming that there are L tiers we define the number of packets allocated to each tier; $\theta_1 \dots \theta_L$.” Ex. 1001, 7:45–49. This example describes how a total number of packets are proportioned among several tiers, not whether or where those packets are queued. Immediately following, the Specification makes clear that, in this example, user IDs, not packets, are queued: “[w]ithin each tier, packets are then allocated in a round-robin fashion in the following manner. γ packets are allocated to the user whose ID is at the head 375 of the tier queue.” *Id.* at 7:52–54.

Read in light of the Specification, “providing said communication resource to queued packet data users on a tier-by-tier basis,” as recited in claim 1, means providing the communication resource to queued users of packet data on a tier-by-tier basis. We are persuaded by Patent Owner that this is the only reasonable reading that is consistent with the Specification.

Petitioner provides no examples in the Specification consistent with its reading. Although the preamble of claim 1 recites a “method of processing queued data packets,” this is consistent with the Specification’s general statement that the invention pertains to “an improved packet data queueing algorithm,” Ex. 1001, 9:3. We do not read this general statement in the preamble of claim 1 (or the similar preamble recitations in claims 11 and 24) to provide a basis for construing more specific language in the body of the claim in a manner inconsistent with the description in the Specification.

In sum, the only reasonable reading of “queued packet data users,” in the context of the dependent claims, and in light of consistent description in the Specification, is queued users of packet data, not users of queued packet data.

B. Asserted Grounds of Unpatentability

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are “such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” We resolve the question of obviousness 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., secondary considerations.² *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

In an obviousness analysis, some reason must be shown as to why a person of ordinary skill would have combined or modified the prior art to achieve the patented invention. *See Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed. Cir. 2008). A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–21 (2007)).

1. Level of Ordinary Skill in the Art

Neither party proposes a level of ordinary skill in the art. We determine that no express finding is necessary, on this record, and that the level of ordinary skill in the art is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

² Patent Owner does not argue that secondary considerations evidence nonobviousness, and the complete record does not include such evidence.

2. Scope and Content of the Prior Art
a. Overview of Lu

Lu describes a class queuing system in a network. Ex. 1002, 1:21–25. The class queuing system processes data transmitted by subscribers based on a class subscribed to by the subscriber (e.g., high, medium, or low classes) relative to a network characteristic (e.g., bandwidth, quality of service, or end-to-end transmission delay). *Id.* at 2:37–46.

An example network is depicted in Figure 2 of Lu, reproduced below:

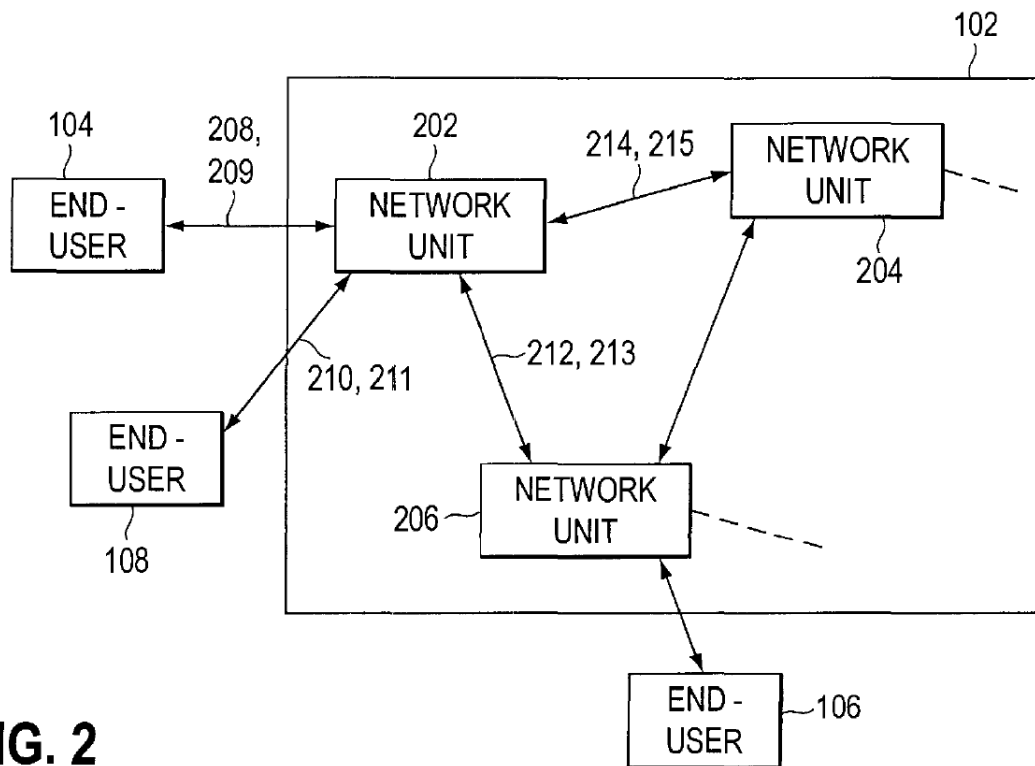


FIG. 2

Figure 2 is a block diagram of a communication network. *Id.* at 2:15–16. Network 102 includes several network units 202, 204, 206, for example, routers, connected to one another via communication links 212–15. *Id.* at 3:11–15, 3:47–53. End users 104, 106, 108 communicate with one another by transmitting data packets through network 102. *Id.* at 3:56–67. Data

packets from multiple users received by a network unit (e.g., network unit 202, received over links 208, 210, 212, 214) are placed into input queues and switched to output queues that correspond to links to destinations (e.g., links 209, 211, 213, 215). *Id.* at 3:61–4:9, 4:10–16, Figure 4.

Figure 5 of Lu, reproduced below, illustrates a more detailed example of an output queue, including a hierarchy of class queues for organizing data packets for transmission via link 209:

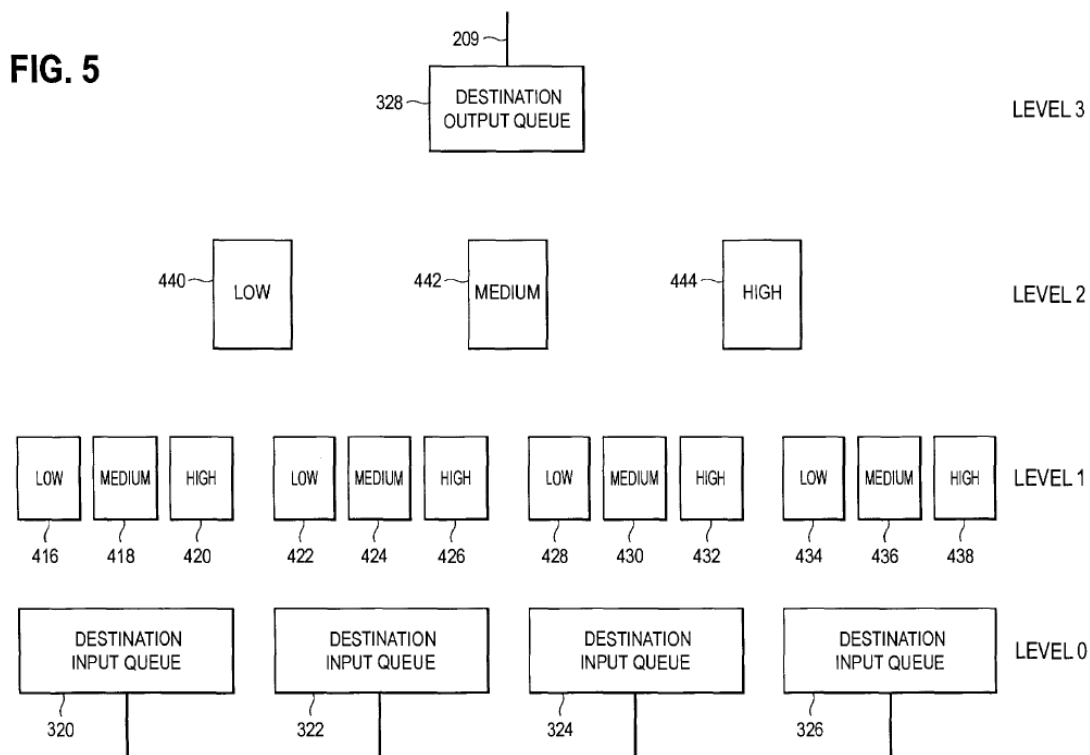


Figure 5 is a block diagram of a queue organization that supports high, medium, and low classes. *Id.* at 2:19, 4:40–42. Data packets received from a user into an input queue are switched to a destination input queue (e.g., with reference to Figure 4, packets received into input queue 302 can be switched to destination input queue 320, also shown in Figure 5). *Id.* at

4:23–29. The destination input queues form level zero queues. *Id.* at 4:44–45. The data packets in destination input queue 320 can be organized into separate level one queues corresponding to low 416, medium 418, and high 420 classes. *Id.* at 4:48–51. Data is treated similarly for destination input queues 322, 324, 326.

Weight sets can be used to regulate the movement of packets from queues at one level to queues at the next level. *Id.* at 3:17–19. “In this way, data from different class subscribers may be controlled to partition a bandwidth of the output port to support the minimum bounds of the subscriber classes.” *Id.* at 3:19–22. The weight sets can be based on such network parameters as subscriber volume, end-to-end delay, video quality, or error rate. *Id.* at 3:23–29, 8:30–45.

An example packet is shown in Figure 7, reproduced below:

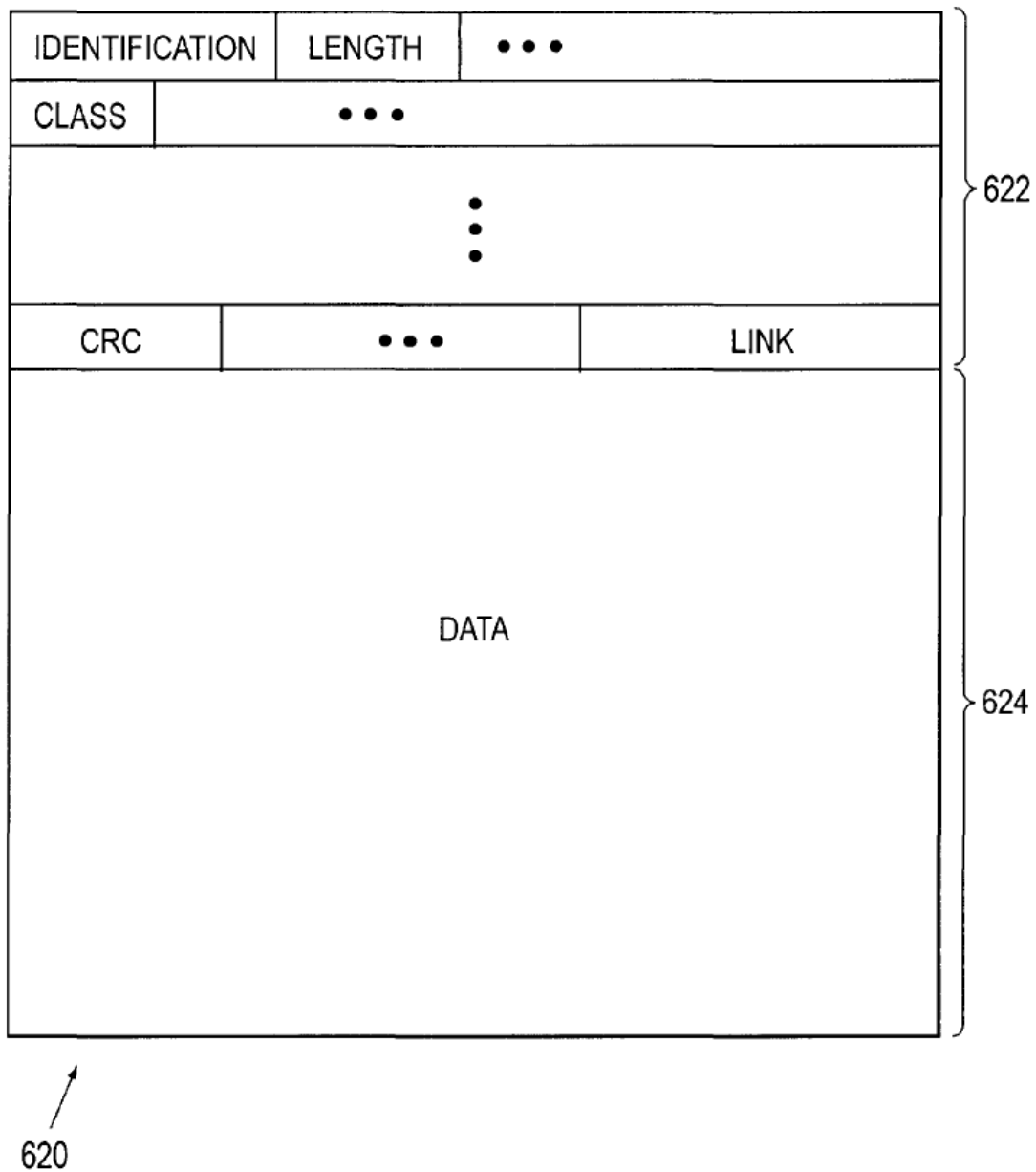


FIG. 7

Figure 7 is a block diagram of a data packet. *Id.* at 2:21. Data packet 620 includes header portion 622 and data portion 624. *Id.* at 5:57–58. Header portion 622 can include “information relating to control and identification of

the data packet 620 such as an identification field, a length field, a class field, a cyclical redundancy code (CRC) field and a link field.” *Id.* at 5:58–62. According to Lu, “[t]he class field may indicate the class of the data packet 620 and the link field may indicate the address of the next data packet of the same class. Thus, the data packets are linked together in the order of arrival at each of the destination input queues 320–326.” *Id.* at 5:62–67.

a. Overview of Pankaj

Pankaj describes various techniques for scheduling transmission of data packets in wireless communications systems (such as CDMA and TDMA cellular systems). Ex. 1003 ¶¶ 6–7, 10. Pankaj describes a system “with application to multiple classes of users” that “incorporates a generalized scheduler” that “accommodates a variety of different scheduling priorities.” *Id.* ¶ 65.

b. Independent claims 1, 11, and 24

Petitioner contends that claims 1, 11, and 24 would have been obvious over Lu.³ Pet. 18–37. Whereas claim 1 recites a “method of processing queued data packets,” claim 11 recites a “packet data scheduler queuing data packets” and claim 24 recites a “packet data communication system operable for processing queued data packets.” The “means for” and “logic for”

³ Petitioner argued, in the alternative, that claims 1, 11, and 24 would have been obvious over Lu and Pankaj. Pet. 16–18. In the Institution Decision, however, we determined that Petitioner did not establish a reasonable likelihood that it would prevail on that ground as to claims 1, 11, and 24, and declined to institute on that ground. Dec. 33–35.

limitations of claims 11 and 24, respectively, largely track the method steps of claim 1. Petitioner refers back to its evidence and argument for claim 1 in its presentations for claims 11 and 24. Pet. 35–37. We treat claim 1 as representative.

Regarding claim element 1[a],⁴ Petitioner contends that Lu’s queues, such as initial class queues 416–438, organized into high, medium, and low classes, are “a plurality of individual packet data queues.” Pet. 19–20. As to claim element 1[b], “determining a total number of data packets that can use an available communication resource,” Petitioner points to Lu’s description of using a weight-based scheduling scheme to transfer packets from one level queue to another. *Id.* at 23–24. Petitioner identifies the transmission capacity of the output link (e.g., 209) as the “available communication resource,” and contends that such weighted transfer during a cycle includes determining a total number of data packets that can be transferred for a cycle.⁵ *Id.* at 24. Petitioner further contends that Lu’s description of using subscriber weights based on subscriber volumes for particular classes teaches “allocating different weights to each tier of service based on a number of users requiring access to the available communication resource,” as recited in claim element 1[c]. *Id.* at 28–30. Regarding claim element 1[d], Petitioner argues that “[b]ecause the weights of Lu vary with the

⁴ We refer the claim elements 1[a]–1[e] as identified in Section I.E, above.

⁵ Patent Owner contends that Lu does not teach claim element 1[b]. PO Resp. 12–23. Because we decide that Petitioner has not shown that Lu teaches claim element 1[e], as detailed below, we do not decide whether Petitioner has shown that Lu teaches claim element 1[b].

available capacity (which in turn would affect the ‘total number of data packets that can use an available communication resource’), the weights of Lu consistently indicate how much (i.e., ‘proportion’) of the capacity (‘total number of data packets’) each class (i.e., ‘tier of service’) will receive.”

Id. at 32.

The parties dispute whether Lu teaches claim element 1[e], “providing said communication resource to queued packet data users on a tier-by-tier basis, such that said communication resource is made available to a number of tiers.”

Petitioner contends that Lu describes end users 104–08 sending packets through network 102 and that, when those data packets are received by network 102, they are placed into queues, such as low, medium, and high class queues 400, 402, 404 (shown in Figure 8 of Lu). Pet. 34; Reply 8–9. Petitioner argues that “when network resources become available, Lu’s network 102 provides these resources to subscribers (i.e., ‘queued data packet users’) in each class (i.e., ‘on a tier-by-tier basis’), such that the resources are allocated to low, medium, and high classes (i.e., ‘the network resource is made available to a number of tiers’).” Pet. 34; *accord* Reply 9. We have considered the testimony of Mr. Lanning on this claim element. Ex. 1006 ¶¶ 73–74. That testimony, however, simply repeats the argument in the Petition without adding to it materially.

Patent Owner responds that, although Lu describes queueing packet data, Petitioner has not shown that Lu teaches queuing users of packet data. PO Resp. 23–25. Thus, Patent Owner argues, Lu does not teach providing communication resources to “queued packet data users,” as recited in

claim 1. *Id.* at 24–25. According to Patent Owner, “[m]erely disclosing queued **packets** does not, without more, teach or suggest queued **users**.” *Id.* at 25. Patent Owner relies on the testimony of Dr. Williams. *Id.* (citing Ex. 2013 ¶¶ 54–55). According to Dr. Williams, in Lu, once packets are placed in class queues, on a first-in first-out basis, no further consideration is given to the user that sent the packet. Ex. 2013 ¶ 26.

We agree with Patent Owner. As explained in Section II.A.2 above, “queued packet data users,” as recited in claim 1, refers to queued users of packet data. Further, we credit Dr. Williams’s testimony that Lu’s description of placing packets in queues does not suggest also queuing users. Ex. 2013 ¶ 55. On the complete record, we find that Lu’s description of queuing data packets does not show queueing users of packet data.

In the Reply, Petitioner advances a new theory, namely, that the “identification” field in Lu’s example data packet (*see* Fig. 7 of Lu, discussed above) identifies a user. Reply 9–10. Thus, Petitioner argues, queuing data packets with identifiers of users constitutes queuing users. *Id.*; *see also* Tr. 20:19–23. At the oral hearing, Petitioner argued that, according to a discussion in Lu, “of course in order to drop packets from the same user in different portions of the queue, you have got to keep track of the user information and who the user is of which particular information. That’s queued along with the data packets that are run through the system.” Tr. 22:17–23:2. Petitioner was unable to provide a cite to Lu and admitted that the argument was presented for the first time at the oral argument. *Id.* at 23:3–9.

Petitioner did not make either argument in the Petition, or present evidence to support either. In fact, Petitioner's Reply argument is inconsistent with the arguments and evidence presented in the Petition. Specifically, for claim 5 (which recites "providing a packet data user with an identification code to assist in the tier allocation"), Petitioner argued that "it would have been obvious for Lu's system to provide 'a packet data user with an identification code' (e.g., in a field of data packet 620)," not that such information was already present in the "identification" field of Lu's packet. Pet. 43. Petitioner argued that a skilled artisan would have been motivated to modify Lu to add an identifier. *Id.* Mr. Lanning echoes these arguments in his testimony, opining that user identification would have been added to Lu's packet, not that it was there already. Ex. 1006 ¶ 97.⁶

Petitioner's Reply argument is not simply rebuttal to the Patent Owner Response. Rather, it is an attempt to formulate a new *prima facie* case of obviousness. The Office has instructed that such improper Reply argument will not be considered:

A reply may only respond to arguments raised in the corresponding opposition. [37 C.F.R.] § 42.23. While replies can help crystalize issues for decision, a reply that raises a new issue or belatedly presents evidence will not be considered and may be returned. . . . Examples of indications that a new issue has been raised in a reply include new evidence necessary to make out a *prima facie* case for the patentability or

⁶ In the Institution Decision, we considered Petitioner's argument and evidence (including Mr. Lanning's testimony, Ex. 1006 ¶¶ 96–97) and determined that Petitioner did not present evidence sufficient to show a reason to modify Lu and, accordingly, declined to institute as to claims 5 and 15. Dec. 26–27.

unpatentability of an original or proposed substitute claim, and new evidence that could have been presented in a prior filing.

Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012); *see also Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1370 (Fed. Cir. 2016) (The “Board did not err in refusing the reply brief as improper under 37 C.F.R. § 42.23(b) because IBS relied on an entirely new rationale.”). Accordingly, we do not consider Petitioner’s Reply argument for claim element 1[e]. For the same reasons, we do not consider the argument Petitioner made for the first time at the oral argument (Tr. 22:17–23:2). Office Patent Trial Practice Guide, 77 Fed. Reg. at 48,768 (“A party may rely upon evidence that has been previously submitted in the proceeding and may only present arguments relied upon in the papers previously submitted. No new evidence or arguments may be presented at the oral argument.”); *see also Dell Inc. v. Accelaron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016) (“In this case, the Board denied Accelaron its procedural rights by relying in its decision on a factual assertion introduced into the proceeding only at oral argument, after Accelaron could meaningfully respond.”).

Moreover, Petitioner’s Reply evidence does not support a finding that Lu’s “identification” field is an identifier for a user. Lu itself simply states that “[t]he header portion 622 may include information relating to control and identification of the data packet 620 such as an identification field, a length field, a class field, a cyclical redundancy code (CRC) field and a link field.” Ex. 1002, 5:58–62. This disclosure does not describe the nature of

the identification field and, specifically, does not state that it identifies a user.

Petitioner ties this description to Lu's description of using weight sets to regulate the movement of data from queues at one level to queues at another level, such that "data from different class subscribers may be controlled to partition bandwidth of the output port." Reply 9 (quoting Ex. 1002, 3:18–23). This description does not mention an "identification" field or otherwise support a finding that the "identification" field identifies a particular subscriber. Indeed, other description in Lu makes clear that data is moved among queues based on class, using the "class" and "link" fields, and not by subscriber. Ex. 1002, 5:62–67 ("The class field may indicate the class of the data packet 620 and the link field may indicate the address of the next data packet of the same class. Thus, the data packets are linked together in the order of arrival at each of the destination input queues 320–326.").

Petitioner also cites to the deposition testimony of Patent Owner's expert, Dr. Williams, as supporting Petitioner's Reply argument. Reply 9 (citing Ex. 1017, 91:16–19). In this testimony, in opining on the requirements of claim 1 (rather than the disclosure of Lu), Dr. Williams states "users are an indication of who the users are, and that indication of who the users are is queued along with the data that they want to communicate." Ex. 1017, 91:16–19. Although we view this as an accurate statement of "queued packet data users," as recited in claim 1 (in particular, that "users" refers to queuing indications of the users rather than queueing actual people), Dr. Williams's testimony does not support Petitioner's Reply

argument that Lu teaches queuing indications of users. As to Lu specifically, Dr. Williams testifies that the header of Lu “does not include a user ID; it includes a source IP address typically.” *Id.* at 92:19–24.

Regarding the “identification” field, Dr. Williams testifies that “[t]hat header portion may include information relating to control and identification of the data packet, not of the user.” *Id.* at 93:15–24. Thus, Dr. Williams’s deposition testimony supports Patent Owner’s understanding of Lu, not Petitioner’s. Petitioner does not cite to testimony of its own expert to support its Reply argument.

In sum, Petitioner has not introduced evidence sufficient to show that Lu teaches “providing said communication resource to queued packet data users on a tier-by-tier basis, such that said communication resource is made available to a number of tiers,” as recited in claim 1. As explained above, the argument presented in the Petition is not consistent with the correct construction of “queued packet data users.” We do not consider the new arguments raised for the first time in the Reply and at the oral argument. Because Petitioner has not shown that Lu teaches element 1[e] of claim 1, Petitioner has not shown, by a preponderance of the evidence, that claim 1 would have been obvious over Lu.

Claim 11 recites “scheduling means to provide said communication resource to queued packet data users on a tier-by-tier basis, such that said resource is made available to all tiers.” Claim 24 recites “scheduling logic for providing said communication resource to queued packet data users on a tier-by-tier, such that said resource is made available to all tiers.” Petitioner refers back to its analysis for claim element 1[e] for these limitations of

claims 11 and 24. Pet. 35–36. For the reasons given above, Petitioner’s evidence does not show that Lu teaches the “scheduling means” and “scheduling logic” of claims 11 and 24, respectively. Accordingly, Petitioner has not shown, by a preponderance of the evidence, that claims 11 and 24 would have been obvious over Lu.

3. Claims 2–4, 7, 12–14, 17, 20, 21, and 23

Claims 2–4 and 7 depend from claim 1. Claims 12–14 and 17 depend from claim 11. Claim 20 recites a communication unit comprising the packet data scheduler of claim 11. Claim 21 depends from claim 20. Claim 23 recites a packet data communication system comprising the packet data scheduler of claim 11. We have considered Petitioner’s evidence as to claims 2–4, 7, 12–14, 17, 20, 21, and 23. Pet. 37–40, 49–50, 55–57, 59. This evidence and argument, however, does not overcome the above-noted deficiencies in Petitioner’s showing as to claims 1 and 11. Accordingly, Petitioner has not shown by a preponderance of the evidence that claims 2–4, 7, 12–14, 17, 20, 21, and 23 would have been obvious over Lu.

4. Claims 22 and 25

Claim 22 depends from claim 20. Claim 25 recites a computer-readable medium comprising computer executable instructions for performing the method of claim 1. Petitioner contends that claims 22 and 25 would have been obvious over Lu and Pankaj. Pet. 57–60. We have considered Petitioner’s evidence as to claims 22 and 25. *Id.* This evidence and argument, however, does not overcome the above-noted deficiencies in

Petitioner's showing as to claims 1, 11, and 20. Accordingly, Petitioner has not shown by a preponderance of the evidence that claims 22 and 25 would have been obvious over Lu and Pankaj.

C. Patent Owner's Arguments Regarding 35 U.S.C. § 315(a) and (b)

In the Preliminary Response, Patent Owner contended that the Petition was barred under 35 U.S.C. §§ 315(a) and (b). Prelim. Resp. 7–16. In the Institution Decision, we determined that the Petition was not barred under Sections 315(a) and (b). Dec. 7–14. Patent Owner did not request rehearing within 14 days of the entry of the Decision. *See* 37 C.F.R. § 42.71(d)(1). In the Patent Owner Response, Patent Owner presents the same arguments, nearly verbatim, without addressing our determination. PO Resp. 33–42. Nevertheless, for the reasons stated in the Decision to Institute, the Petition is not barred under Sections 315(a) or (b).⁷

III.CONCLUSION

Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–4, 7, 11–14, 17, and 20–25 are unpatentable.

⁷ We note that the Federal Circuit has held that 35 U.S.C. § 314(d) prohibits review of a Board determination to initiate IPR proceedings based on our assessment of the time-bar of Section 315(b), even if such assessment is reconsidered during the merits phase of proceedings and restated as part of the Board's final written decision. *See Achates Reference Publ'g, Inc. v. Apple Inc.*, 803 F.3d 652, 658 (Fed. Cir. 2015); *but see Wi-Fi One, LLC v. Broadcom Corp.*, 2015-1944 (Fed. Cir. Jan. 4, 2014) (granting rehearing en banc to determine, *inter alia*, whether to overrule *Achates*).

IV. ORDER

For the reasons given, it is:

ORDERED, based on a preponderance of the evidence, that claims 1–4, 7, 11–14, 17, 20, and 21–25 are not unpatentable; and

FURTHER ORDERED, because this is a final written decision, the parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

J. Robert Brown, Jr.
rbrown@dfw.conleyrose.com

Charles Rogers
crogers@conleyrose.com

PATENT OWNER:

Lori Gordon
lgordon-PTAB@skgf.com

Byron Pickard
bpickard-PTAB@skgf.com

James Hietala
jhietala@intven.com

Tim Seeley
tim@intven.com

Steven Peters
speters@skgf.com