

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

HEADWATER RESEARCH LLC,
Patent Owner

IPR2023-01250
Patent 9,277,433

PATENT OWNER RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Ex.	Description
2001	U.S. Patent Application Publication No. 2008/0080457 to Cole (“Cole-2”)
2002	Redline of the text of Cole (Ex. 1005) and Cole-2 (Ex. 2001)
2003	International Publication No. WO 2006/012610 to Rao et al. (“Rao-2”)
2004	Redline of the text of Rao (Ex. 1007) and Rao-2 (Ex. 2003)
2005	U.S. Patent No. 8,825,109 to Montemurro et al. (“Montemurro Patent”)
2006	Redline of the text of Montemurro (Ex. 1009) and the Montemurro Patent (Ex. 2005)
2007	RTP A Transport Protocol for Real-Time Applications (July 2003), <i>available at</i> https://www.rfc-editor.org/rfc/rfc3550.pdf
2008	User Datagram Protocol (Aug. 28, 1980), <i>available at</i> http://www.ietf.org/rfc/rfc768.txt
2009	Declaration of Dr. Zygmunt J. Haas
2010	<i>Curriculum Vitae</i> of Dr. Zygmunt J. Haas
2011	Transcript of Deposition of Dr. Patrick McDaniel on June 4, 2024

I. SUMMARY OF GROUNDS

Petitioner challenges claims 1-20 of U.S. Patent No. 9,277,433 (“’433 Patent,” Ex. 1001) under five obviousness grounds (Pet. at 1):

Ground	Claim(s)	35 U.S.C. §103
1A	1-3, 6, 10-11, 13-14, 17	Rao-Cole
1B	2-3, 5, 7-9, 16	Rao-Cole-Freund
1C	2, 4	Rao-Cole-Singh
1D	12, 20	Rao-Cole-Montemurro
1E	15, 18-19	Rao-Cole-Gandhi

For the reasons below, the Petition fails to show that claim 1 is rendered obvious by Rao and Cole under Ground 1A. Claim 1 is the only independent claim, and all other claims depend (directly or indirectly) from claim 1. Thus, the Petition’s deficiencies discussed for claim 1 apply to all grounds and all challenged claims. Accordingly, the Petition fails to prove invalidity for any challenged claim.

II. THE ’433 PATENT

A. Overview

At a high level, the ’433 Patent (Ex. 2001) is generally directed to a system having multiple wireless modems, which uses a differential traffic control policy to determine whether to apply various “internet activity access controls” with respect

to a first Internet access request “based at least on which of [a] plurality of wireless network types is to provide data communication.” *See* Declaration of Dr. Zygmunt J. Haas (“Haas Decl.,” Ex. 2009) ¶¶ 29-31. As part of the application of those access controls, the system will aggregate network activity for the first Internet access request with activity for other data communication requests, before allowing network activity in association with the first Internet access request.

The '433 Patent teaches that determining which access controls should be applied based on wireless network type allows the claimed system to encourage different application behavior on different network types, e.g., “to encourage certain behavior such as sending low QoS traffic when it is cheaper (e.g., when on . . . Wi-Fi, as opposed to . . . cellular).” '433 Patent at 102:54-59.

Additionally, the '433 patent teaches that aggregation of network activity from a first Internet access request with network activity from other requests from other applications before allowing the first network activity advantageously reduces the frequency of resource-intensive changes in modem state such as “awakening the modem” or “changing the power state of the modem” need to occur. *See id.* at 93:62-94:1 (“[A] network service usage activity is prevented from awakening the modem [or] changing the power state of the modem . . . until multiple network service usage activities require such changes in modem state, or *until network service usage*

activity is aggregated to increase network capacity and/or network resource utilization efficiency.”).¹

B. '433 Patent Claims

Petitioner challenges all claims 1-20 of the '433 Patent. Claim 1 is the only independent claim. Claim 1 recites:

Identifier	Claim Language
[1.1]	A wireless end-user device, comprising:
[1.2.a]	a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN,
[1.2.b]	the at least one WWAN having a corresponding network type of a plurality of wireless network types supported by the device for data communication;
[1.3]	a non-transitory memory to store a network service activity control policy set, the policy set including at least a first differential traffic control policy element associating one or more Internet activity access controls with at least a first end-user application; and
[1.4]	one or more processors configured to
[1.5]	access the network service activity control policy set,
[1.6]	determine whether to apply the one or more Internet activity access controls with respect to a first Internet access request by or on behalf of the first end-user application, based at least

¹ All emphasis added unless otherwise noted.

Identifier	Claim Language
	on which of the plurality of wireless network types is to provide data communication for Internet access requests, and
[1.7]	when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests, which are otherwise not associated with the first end-user application, before allowing network activity in association with the first Internet access request.

'433 Patent, cl. 1.

C. Prosecution History

The '433 Patent was originally filed as application 14/688,704 on April 16, 2015. '433 Patent at Cover. The Patent Office did not issue any prior art rejections during prosecution. The Patent Office only issued one Office Action, a double patenting rejection over other applications 14/677,778 and 14/675,113. '433 FH (Ex. 1002) at 660-79; McDaniel Decl. ¶ 47. Applicant filed a terminal disclaimer, and all claims were allowed. '533 FH at 838, 860-62; Pet. at 5.

The Petition asserts that that Patent Office “never considered Rao, Cole, Freund, Singh and Montemurro.” Pet. at 5. This is incorrect, as explained in the POPR and acknowledged in the Board’s Institution Decision. The Examiner considered family members to the Rao (Ex. 2003) and the Cole (Ex. 2001) references relied on in the Petition for the challenge to the sole independent claim, as well as

the issued version of the Montemurro reference (Ex. 2005) relied on for certain dependent claims. *See* Pet. at 75 (admitting the Cole and Rao family members were before the Examiner); *see also* '433 Patent at 7, 8, 10 (listing the Cole and Rao family members and as-issued Montemurro in the References Cited section); Ex. 1002 at 258, 267, 270 (listing the Cole and Rao family members and as-issued Montemurro on IDSs that the Examiner signed).

As explained in the POPR and acknowledged by the Board, the Rao and Cole family members and Montemurro issued patent each has only negligible differences when compared with the corresponding reference relied upon by the Petition. That is any such differences have no consequence to the invalidity theories presented in the Petition. *See, e.g.*, Ex. 2002 (comparison of Cole to the Cole family member before the Examiner); Ex. 2004 (comparison of Rao to the Rao family member before the Examiner); Ex. 2006 (comparison of Montemurro to the as-issued Montemurro). Accordingly, the Petition's assertion that the PTO "never considered" the Rao, Cole, and Montemurro is misleading and fails to support unpatentability.

III. PRIORITY DATE AND LEVEL OF ORDINARY SKILL

The '433 Patent claims priority to an earliest provisional application filed on January 28, 2009. '433 Patent at Cover. The Petition does not dispute that as the priority date for purposes of this IPR or assert a different priority date. *See* Pet. at 1-2. Therefore, Patent Owner will assume January 28, 2009, as the priority date for the

'433 Patent for purposes of this proceeding. But as Patent Owner's expert Dr. Haas explained, his opinions would not change if the appropriate priority date were determined to be in the range of 2009-2011. *See* Haas Decl. ¶¶ 36-37.

Petitioner proposes that a person of ordinary skill in the art (POSITA) in field of the '433 Patent "would have had at least (1) at least a bachelor's degree in computer science, electrical engineering, or a related field, and (2) three to five years of experience with networking, power consumption of networked computing devices, and/or wireless digital communications systems. More education, e.g., a doctorate in an academic area emphasizing electrical engineering, computer engineering, computer science, or a related technical field, would compensate for fewer years of work experience." Pet. at 13. n.2 (citing McDaniel Decl. ¶¶ 17-18); *see* Pet. at 13 n.2 (citing Ex. 1003 ¶¶ 17-18). The Board preliminarily adopted this definition in its Institution Decision. ID at 9.

For purposes this proceeding, Patent Owner does not challenge the definition of POSITA proposed by Petitioner and preliminarily adopted by the Board. This definition is reasonable, and a different reasonable level of skill would not affect the outcome in this case. *See* Haas Decl. ¶¶ 38-39.

IV. CLAIM CONSTRUCTION

The Board need not construe any claim terms unnecessary to resolve the parties' dispute. The Petition proposes no constructions and asserts that "no formal

claim constructions are necessary.” Pet. at 2. Patent Owner agrees that no express constructions are necessary, and the claims of the '433 Patent carry their plain and ordinary meaning in view of the claim language and specification.

But at the outset, Patent Owner discusses the interpretation of two aspects of claim 1 because they may be helpful in resolving the parties' invalidity disputes. The below interpretations follow directly from the plain meaning and structure of claim 1. *See* Haas Decl. ¶¶ 40–50. Thus, they do not depend on a particular construction of any claim terms beyond applying their plain and ordinary meaning. *Id.*

Notably, Petitioner and its expert do not discuss or justify a different interpretation of claim 1. To the extent Petitioner advances a different understanding of the claim limitations, it would be: (1) a new argument outside of the Petition and Dr. McDaniel's declaration, and (2) unsupported and contrary to the plain and ordinary meaning of the claim language.

A. Claim Limitations [1.6] & [1.7]

Claim limitation [1.6] describes a binary yes/no determination, and if the determination is yes, then limitation [1.7] is performed. *See* Haas Decl. ¶¶ 42-44. This follows from the plain meaning of claim 1, with relevant language emphasized:

Identifier	Claim Language
[1.4]	one or more processors configured to . . .

Identifier	Claim Language
[1.6]	<i>determine whether to apply the one or more Internet activity access controls</i> with respect to a first Internet access request by or on behalf of the first end-user application . . . and
[1.7]	<i>when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to</i> aggregate network activity for the first Internet access request with network activity for one or more other data communication requests . . .

Claim limitation [1.6] describes the processor determining “whether [or not] to apply” the one or more Internet activity access controls (for a first Internet access request by a first end-user application). *Id.* This is a binary, yes/no determination. Either the processor will decide to apply the Internet activity access controls (answer “yes”), or it will decide to *not* apply the controls (answer “no”). *Id.*

If the processor makes an affirmative determination in claim limitation [1.6], then it performs limitation [1.7]. Limitation [1.7] begins: “when the one or more Internet activity access controls are to be applied . . .” This refers to the determination made in limitation [1.6]. The remainder of limitation [1.7] describes what happens next: the one or more processors will “apply the one or more Internet activity access controls to . . .” (limitation [1.7] is further described the next subsection.) The point here is to explain the *if/then* structure of limitations [1.6] and [1.7]; i.e., if the condition in limitation [1.6] is satisfied, then limitation [1.7] is performed.

Petitioner's expert Dr. McDaniel agreed with this interpretation of limitations

[1.6] and [1.7], as shown by his deposition testimony. *See, e.g.:*

Q: do you understand Claim 1.6 to be talking about a binary determination of whether to apply the "one or more Internet activity access controls"?

...

A: So within the scope of this, whether or not you're going to apply some control is a determination of whether to apply the control. So the -- *you either apply it or you don't*. What that control is, is, you know, up to the policy.

Q: So you said "you either apply it or you don't."

A: Yes.

Q. And you agree that, whether you apply it or you don't, is a binary decision?

A: *Logically, yes, whether you apply it or you don't*, which is true of policy. What that policy involves and how you would apply it, whether you apply it, is part of the determination step.

Transcript of Deposition of Dr. Patrick McDaniel on June 4, 2024 (McDaniel Tr.," Ex. 2011) at 49:18-50:19.

Q: And my question is, for Claim 1.7, it begins with "when the one or more Internet activity access controls are to be applied."

Do you agree that that is referring to the determination step in 1.6?

A: So the degree I can understand what you're asking, I would say that *the determination to whether apply would lead to a determination to apply the policy, and that's where 1.7 begins*.

Where it has been determined that one or more activity access control are to be applied, in that sense, that's what 1.6 is determining whether or not that's true.

Id. at 53:8-21.

Q: you used the phrase "that's where 1.7 begins." Do you recall that?

A: Yes.

Q: What do you mean by that?

A: *So when the determination of 1.6 is complete and it's determined in the affirmative to apply policy, that's when -- moving on to 1.7 -- when the "one or more Internet activity access controls" are to be applied. That's what I mean.*

Q: And then everything in 1.7 occurs when that happens.

A: So, you know, going to the first sentence, "when [the] one or more Internet activity access controls are to be applied," ***then what remains in Claim [1.]7 is practiced.***

Id. at 55:13–56:5.

B. Claim Limitation [1.7]

As Petitioner's expert Dr. McDaniel acknowledged, if an affirmative determination is made in limitation [1.6] (determining to "apply the [] Internet activity access controls with respect to a first Internet access request by or on behalf of the first end-user application . . ."), then limitation [1.7] is performed. This includes the claim language bolded below, which Dr. McDaniel testified "is practiced." *See* McDaniel Dep. at 55:13-56.5 (agreeing that if limitation [1.6] is

determined in the affirmative, then the remaining language after the first clause in limitation [1.7] is practiced).

Identifier	Claim Language
[1.4]	one or more processors configured to . . .
[1.7]	when the one or more Internet activity access controls are to be applied, <i>apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests</i> , which are otherwise not associated with the first end-user application, <i>before allowing network activity in association with the first Internet access request.</i>

Thus, limitation [1.7] recites aggregating network activity for “the first Internet access request” with network activity for data communication requests from other applications. This is referred to herein as the “claimed aggregation.” Two aspects of limitation [1.7] are apparent from the plain and ordinary meaning of the claim language. *See* Haas Decl. ¶¶ 45-49. *First*, the claimed aggregation will always be performed (if an affirmative determination is made in limitation [1.6]). *Id.* Limitation [1.7] recites that the processor will “apply [] access controls *to aggregate network activity . . .*” *Id.* The claimed aggregation is not selective or optional, but rather it is a requirement of limitation [1.7]. *Id.*

Second, the claimed aggregation must occur “before allowing” network activity for the “first Internet access request.” *Id.* Limitation [1.7] requires

aggregating the network activity for the first request with network activity for other data communication requests as a precondition to allowing network activity for that first request. *Id.* In other words, limitation [1.7] *disallows* any network activity for the first Internet access request, *unless* it has been aggregated with network activity for other requests from other applications. *Id.*

The '433 Patent teaches that disallowing network activity until aggregation occurs in such scenarios is important, because it reduces the frequency with which battery- and network-resource intensive changes in the modem state (such as “awakening the modem” or “changing the power state of the modem”) need to occur. *See* '433 Patent at 93:62-94:1 (“*[A] network service usage activity is prevented from awakening the modem [or] changing the power state of the modem . . . until multiple network service usage activities require such changes in modem state, or until network service usage activity is aggregated to increase network capacity and/or network resource utilization efficiency.*”). This is consistent with the claimed invention as recited in Claim 1, which describes that the claimed network activity is not allowed (i.e., is prevented), *until* the network service usage activity is “aggregated” with other network service usage activities. *See id.* at 105:65-106:6 (“*aggregate network activity for the first Internet access request with network activity for one or more other data communication requests . . . before allowing network activity in association with the first Internet access request*”).

As discussed further below, Petitioner and its expert Dr. McDaniel incorrectly ignore the requirements of limitation [1.7]. For example, the claim language expressly requires performing the claimed aggregation (“apply [] access controls *to aggregate network activity*”). But Dr. McDaniel testified in deposition that even if Internet access controls are applied, aggregation is optional and may not occur. *See* McDaniel Dep. at 57:4-19 (“Q: do you understand that the aggregation as recited in Claim 1.7 is performed every time, always, ‘when the one or more Internet activity access controls’ are to be applied? . . . A: So if you’re asking me that whenever ‘one or more Internet activity access controls’ are to be applied *aggregation must happen as a consequence, then the answer is no. Sometimes there’s aggregation and perhaps sometimes there’s not.*”). This is unsupported and incorrect.

V. OVERVIEW OF ASSERTED PRIOR ART

Patent Owner’s Response focuses on the Petition’s theory for claim 1 under Ground 1A based on Rao and Cole. The Petition relies on secondary references Freund, Singh, Montemurro, or Gandhi only to meet certain limitations of dependent claims (under Grounds 1B-1E). *See* Pet. 1. Because the secondary references are immaterial to the arguments in Patent Owner’s Response, they are not addressed herein. Patent Owner now provides a brief overview of the Rao and Cole references that the Petition relies on for claim 1. *See* Haas Decl. ¶¶ 55-58.

A. Rao

Rao (Ex. 1005) is directed to “remote access architecture” for a system that provides “peer-to-peer communications and remote access connectivity.” Rao at Abstract. It addresses inefficient use of network resources when network communications are “processed in the order generated by the activity of a user and applications of the client.” *Id.* ¶ [0002]. Rao describes a prioritization scheme that “provide[s] application-aware, client-specific prioritization of packet traffic.” *Id.* ¶ [0003]. Rao further describes “client centric prioritization of application network communications on a client based on the type and/or priority of an application.” *Id.* ¶ [0179], Fig. 5A.

To perform this prioritization, Rao “appl[ies] a policy to determine a condition of the client 105, or endpoint, at the time of transmission of the packet.” *Id.* ¶ [0109]. According to Rao, policies 520 can be specified by “name of the application 338a-338n,” “type of application 338a-338n,” or “type of one or more protocols used by the applications 338a-338n.” *Id.* ¶ [0182]. Further, policies 520 are used to “determine which packets to queue and/or discard” and “apply a priority to network packets of applications 338a-338n.” *Id.* ¶ [0207].

B. Cole

Cole (Ex. 1006) is titled “Connection Manager with Deferred Configuration” and relates to “configuring a mobile device including a plurality of communication

interfaces.” Cole (Ex. 1006) at Title, Abstract. A diagram of mobile device 110 is shown in Fig. 2 of Cole. As shown in Fig. 2, mobile device 110 includes various communication interfaces 225 and connection manager 260. *See* Cole ¶ [0035].

According to Cole, connection manager 260 “manages the various communication interfaces 225 to determine which connections should be active at any given time” (*id.* ¶ [0036]) and performs “communication load monitoring and deferred action functions” (*id.* ¶ [0088]). Cole states that a user may select a file to download, but the file may take longer than anticipated to transfer using the WWAN modem 230, “which consumes significant battery power.” *Id.* ¶ [0088]. When this occurs, “[t]he connection manager 260 identifies the load on the WWAN modem 230 and asks the user to find a better connection.” *Id.*

VI. CLAIM LIMITATION [1.6]

The Petition fails to show that Rao in view of Cole (Rao-Cole) renders obvious claim limitation [1.6] of the '433 Patent. *See* Haas Decl. ¶¶ 59-107.

Limitation [1.6] recites:

Identifier	Claim Language
[1.6]	determine whether to apply the one or more Internet activity access controls with respect to a first Internet access request by or on behalf of the first end-user application, based at least on which of the plurality of wireless network types is to provide data communication for Internet access requests, and

Limitation [1.6] requires determining whether to apply Internet activity access controls to a first Internet access request by the first user application, based on which “wireless network type” (e.g., cellular or Wi-Fi) is to provide data communication for Internet access requests. Haas Decl. ¶ 60. As the '433 Patent explains, differential network access policies advantageously consider the type of wireless network being used, i.e., when the device is “*on a certain type of network, such as Wi-Fi as opposed to another, such as cellular, etc.*” '433 Patent at 102:54-59. This allows the system to implement control policies tailored to the network type, e.g., “to encourage certain behavior such as sending low QoS traffic when it is cheaper (e.g., when on ... Wi-Fi, as opposed to... cellular).” *Id.*

The Petition presents two theories for how claim limitation [1.6] is met. *First*, it asserts that Rao alone “teaches or renders obvious” this limitation. Pet. at 28-29 (citing McDaniel Decl. ¶¶ 106-08). *Second*, and in the alternative, the Petition asserts that that Rao-Cole renders the limitation obvious. Pet. at 29-30 (citing McDaniel Decl. ¶ 109). Both theories fail to show obviousness and are addressed in turn.

A. Rao Theory

The Petition fails to show that Rao teaches or render obvious determining whether to apply Internet activity access control to a first Internet access request by the first application based on “*wireless network type.*” See Hass Decl. ¶¶ 62-82.

1. The Petition's arguments implicate two distinct categories of protocols.

By way of background, there are a large variety of different protocols, which, for purposes of evaluating the arguments in the Petition, fall into two distinct categories. Haas Decl. ¶ 63. The first category is what the Petition and Dr. McDaniel call “network interface protocols.” Pet. 28-29. These “network interface protocols,” according to the Petition, include GSM (Global System for Mobile communication), CDMA (Code-division multiple-access), and 802.11 (IEEE 802.11 standard) Pet. at 28. As the Petition acknowledges, these are protocols that are used by wireless modems to physically transmit the data signals across a wireless network. *Id.* at 28-29. The Petition and Dr. McDaniel contend that these protocols indicate wireless network type. Rao does not mention GSM or CDMA, and only mentions 802.11 in the background. Rao (Ex. 1005) ¶ [0095].

A second distinct category of protocols are protocols used by applications to package information into a series of bits, are referred to herein as “application protocols” for ease of reference. Haas Decl. ¶ 64. These application protocols include what Rao describes as UDP (User Datagram Protocol), RTP (Real Time Protocol), ICA (Independent Computing Architecture), and RDP (Remote Desktop Protocol). *See* Rao ¶¶ [0051], [0077], [0192]). These protocols don't indicate wireless network type, and the Petition doesn't allege that they do. Haas Decl. ¶ 64.

Further, nothing in Rao indicates that this category of application protocols indicates wireless network type. *Id.* Rather, ICA and RDP are disclosed as “remote display protocol[s]” used by applications, which are not disclosed as indicating any specific type of network connection at all, much less a wireless network connection. Rao ¶¶ [0051], [0056], [0192]. RTP and UDP are also disclosed as being “used by the application,” and were well known to be independent of network type used for physical communication between devices. *See* Ex. 2007 at 1, *available at* <https://datatracker.ietf.org/doc/html/rfc3550> (RTP Spec.) (“RTP and RTCP are designed to be independent of the underlying transport and network layers.”); Ex. 2008 at 1, *available at* <https://www.ietf.org/rfc/rfc768.txt> (UDP Spec.) (explaining that UDP “assumes that the Internet Protocol (IP) is used as the underlying protocol,” which is agnostic to wireless network type such as WLAN vs WWAN).²

2. The Petition’s theory is based on Rao’s alleged disclosure of using *network interface* protocols to apply Internet activity access controls.

Claim limitation [1.6] requires the system to determine whether to apply the “Internet activity access controls to a first Internet access request by the first application based on which of a plurality of wireless network types is being used.”

² Indeed, protocols such as UDP is known to be at the Transport Layer of the ISO/OSI protocol STACK. Haas Decl. ¶ 65. The Transport Layer is above the MAC and the PHY layers, which are specific to a wireless or wired network access, and the Transport Layer is separated from the MAC Layer by the Network Layer. *Id.*

The Petition relies on Rao's "prioritization of network communications related to applications" as constituting the alleged "Internet activity access controls" of limitation [1.3], from which limitation [1.6]'s recitation of "the one or more Internet activity access controls" derives antecedent basis. *See* Pet. at 26. The Petition also relies on Rao's priority-based queueing for limitation 1.7. *See* Pet at 30-31 (alleging that applying Internet access controls involves "storing network packets to a queue and determining the queued network packets are 'associated with a first application of the client,'" and determining a "priority for the . . . queued network packet" based on characteristics of the issuing application).

But the Petition doesn't allege that Rao explicitly discloses applying "prioritization of network communications," such as queuing or prioritizing packets, based on network type. Instead, it argues that this teaching can be derived from Rao (or would be obvious) based on the following argument:

Because Rao teaches that policies can be applied based on network interface protocols, and network interface protocols indicate wireless network types, Rao teaches or renders obvious determining whether to apply Internet activity access controls based on network type.

Pet. at 29 (citing McDaniel Decl. ¶ 106).

Thus, the Petition's argument has this structure: (1) Rao teaches that policies can be applied based on network interface protocols; (2) network interface protocols

indicate wireless network types; and (3) therefore, Rao teaches determining whether to apply Internet activity access controls based on network type. This fails.

3. The Petition's theory fails because Rao doesn't teach or suggest using network interface protocols to apply Internet activity access controls.

The Petition's argument fails from the first premise because Rao does not teach or suggest that “policies can be applied based on network *interface protocols*.” See Haas Decl. ¶¶ 69-76. The “network interface protocols” (such as GSM or CDMA) that the Petition relies on here are protocols that relate to which network type is being used to communicate. See Pet. at 28 (arguing that GSM and CDMA can be used to implement WWAN connections such as 3G, and the 802.11 protocol can be used to implement WLAN connections such as 802.11).

But these “*network interface protocols*”—which determine how information is communicated through a network interface—are materially different from the application protocols such as UDP, RTP, RDP, and ICA that Rao is referring to. And as discussed above, these application protocols do *not* indicate the network type (much less the wireless network type). *Id.* While paragraphs [0104] and [0182] of Rao disclose that Rao's policies can depend on the type of “protocols” used, Rao does *not* teach applying policies based on *network interface protocols*. See Rao ¶¶ [0104], [0182] (no mention of any network interface protocols).

Instead, in the instances where Rao provides detail about the “protocols” used to determine communication priorities, it only describes prioritizing based on the network-agnostic protocols used by applications, such as RTP, UDP, ICA, and RDP—and not based on *network interface* protocols such as 802.11. *See id.* ¶ [0192] (discussing queuing and prioritizing packets on the basis of “a type of *protocol used by the application* 338a-338n, *such as RTP or UDP*”); *id.* (“In a further example, a queue 540a may be used for *applications* [338a]-338n *communicating using a remote display protocol, such as ICA or RDP*.”). Indeed, paragraph [0182] of Rao makes clear that prioritization is based on these types of *application* protocols, rather than network-interface protocols such as CDMA or 802.11. *Id.* ¶[0182] (“[T]he policies 520 may be specified in accordance to the type of one or more protocols *used by the applications . . .*”).

Rao’s disclosures are consistent with what a POSITA would have understood about the type of protocols used by applications. Haas Decl. ¶ 72. Typically, applications do not use (i.e., access) network interface protocols such as CDMA or GSM. *Id.* Rather an application will use an application-level protocol such as RTP or UDP and then the network interface protocols will package the data from those application-level protocols into an appropriate transmission over the appropriate network, such as WLAN, WWAN, LAN, or WAN. *Id.*

The Petition provides no evidence that Rao teaches or renders obvious applying policies based on of *network interface* protocols, as opposed to network-agnostic application protocols. *Id.* To the contrary, Rao does *not* teach or suggest applying policies based on any protocols that would indicate the type of wireless network being used. *Id.*

In fact, applying Rao's prioritization policies differently depending on which wireless network is being used is inconsistent with the overall teachings of Rao, which specify that certain types of data should take priority over other types of data. *Id.* ¶ 74. For example, Rao teaches that if a "network packet contains real-time data or is from a VoIP application," "the network packet may be communicated ahead of non-real-time data communications or ahead of network communications or from other applications." Rao ¶ [0080]. Rao thus teaches that packets from certain applications and certain protocols should be prioritized in certain ways because those packets are generally more important to transmit first.

Nor does Rao suggest any motivation to modify the way that these packets are prioritized depending on what type of wireless network is being used for Internet communications. A POSITA would have not been motivated to pursue such a modification. Haas Decl. ¶¶ 75-76. Instead, given the nature of Rao's system, it would have been more advantageous and sensible for high-priority packets to

maintain their high-priority status *regardless* of which wireless network type (such as WWAN or WLAN) is used to communicate those packets. *Id.*

By analogy, the United States has “traffic prioritization” rules where traffic from emergency vehicles is prioritized ahead of traffic from ordinary vehicles, and this prioritization scheme is unchanged regardless of the type of road (such as a highway or a boulevard) is being used. And it would be disadvantageous and illogical to say that emergency vehicles should have priority on boulevards, but they should *not* have priority on highways. Similarly, if Rao’s system determines that certain packets should have priority over other packets, there is no evidence that a POSITA would have abandoned or modified that priority determination based in any part on the “wireless network type” used to communicate those packets. A POSITA would not have been motivated to remove or to modify this aspect of Rao’s priority system, in view of Rao’s overall system and teachings. *Id.* ¶ 76.

4. Dr. McDaniel’s alternate example a temporary disruption in a network connection also fails.

Although not adequately discussed in the Petition, Dr. McDaniel mentions an alternate “example” in Rao of a temporary disruption in a network connection of a mobile client. McDaniel Decl. ¶ 108 (citing Rao ¶ [0081]). In such cases, Rao “detects a disruption in the network and shields a portion of the network stack from the network disruption[.]” *Id.* And “once the network is available,” “the client’s

network communications continue.” Rao ¶ [0081]. Dr. McDaniel then asserts that the example “describes determining whether to apply Internet activity access controls . . . based on the network type ‘when the client switches between networks (e.g., from a wired network to a wireless network).’” McDaniel Decl. ¶ 108.

This likewise fails. The alternate example merely states that Rao detects *any* disruption in the network (regardless of cause), shields the network stack during the disruption, and resumes communication after the connection is reestablished. Haas Decl. ¶¶ 77-82. The system only detects whether the network connection is available or not (a binary yes/no determination). *Id.* There is no suggestion that Rao determines whether to apply any alleged access controls (such as queuing particular packets while a disruption exists) based on the *type* of network connection that was disrupted or the *type* of network connection that is reestablished. *Id.*

Indeed, the relevant sentence in Rao states: “A temporary disruption in a network connection may occur when the mobile client roams *between different access points in the same network, or when the client switches between networks* (e.g., from a wired network to a wireless network).” Rao ¶ [0081]. From this context, Rao says that the temporary disruption, which is alleged to trigger certain access controls, is the result of a change in connectivity status (including changes within a single network). But there’s no evidence that Rao considers which type of wireless network (as opposed to simply identifying the loss of connectivity) in determining a

temporary disruption has occurred, such that application of access controls would be “based on which of a plurality of wireless network types is being used.”

Even assuming counterfactually that Rao did disclose applying access controls differently between a wired and wireless network (it does not), that would still not meet the claim. Haas Decl. ¶ 81. This is because limitation [1.6] requires determining whether to apply particular access controls “based on *which of a plurality of wireless network types* is being used.” Thus, applying access controls differently between a “wired” network and a “wireless” network would not satisfy this requirement because it would not require a determination based on which of a plurality *wireless* network types is in use (e.g., cellular or Wi-Fi). *Id.*

Accordingly, Rao’s alternate example does not disclose or render obvious determining which policies to apply based on the wireless network type. *Id.* ¶ 82. At most, it describes what happens during a temporary network disruption. But it doesn’t describe determining the type of network connection, let alone applying “Internet activity access controls” based on the wireless network type.

B. Alternative Cole Theory

For claim limitation [1.6], the Petition asserts that “[t]o the extent that Rao alone does not render this element obvious, RCD does.” Pet. at 29. But the Petition doesn’t articulate any combination of Rao and Cole. Instead, it presents a cursory paragraph and asserts that Cole “teaches” limitation [1.6]. The Board agreed that this

alternate theory is focused exclusively on Cole. *See* Inst. Dec. at 26 (“Although the Petition and Dr. McDaniel’s testimony both state that this alternative theory is based on the combination of Rao and Cole, the focus is exclusively on Cole.”).

Specifically, the Petition and Dr. McDaniel rely on two different examples of Cole: (1) asking the user to find a better connection (Cole ¶ [0088]) and (2) attempting to establish a connection with a higher bandwidth (*id.* ¶¶ [0077-0078]). But none of these disclosures of Cole teaches or renders obvious limitation [1.6]. Patent Owner addresses each in turn. *See* Haas Decl. ¶¶ 85-107.

1. Cole ¶ [0088]

The Petition asserts, relying on ¶ [0088] of Cole that:

Cole’s ‘connection manager 260 identifies the load on the WWAN modem 230 and asks the user to find a better connection.’ Thus, Cole teaches applying Internet access controls (asking the user to find a better connection) on behalf of the first end-user application (file download) based on being connected to the 3G wireless network type that is to provide data communication for the request.

Pet. at 30 (citing McDaniel Decl. ¶ 109)

This fails. Cole’s disclosure in paragraph [0088] about “asking the user to find a better connection” (i.e., the alleged “Internet activity access control[.]”) does not constitute applying Internet access controls to an Internet access request based on

the wireless network type, as required by limitations [1.6] and [1.7]. The Petition's argument fails for at least three reasons. *See* Haas Decl. ¶¶ 87-99.

a. Not Based on Wireless Network Type

First, there is no evidence that the alleged “Internet access control” of Cole—asking a user to find a better connection—is determined “based at least on which of the plurality of wireless network types is to provide data communication” (as required by limitation [1.6]). Cole's example in paragraph [0088] is that the connection manager “*identifies the load* of the WWAN modem” and sends a user prompt based on that load. Cole ¶ [0088]. The “load” is a determination about the capacity of the network connection, not the type of network connection. Cole describes the “monitored load” as “exceed[ing] a predetermined threshold (e.g., 85% of capacity).” *Id.* ¶ [0075]-[0076] (consistently describing the load in terms of channel capacity). Cole does not disclose that the connection *type*, separate from the observed network load, forms the basis for requesting whether the user wants to search for a better connection. There is no disclosure in Cole that the specific connection type (e.g., WWAN) either causes or prevents the alleged Internet access control (asking the user to find a better connection).

This is confirmed by Cole's figures. Para. [0088] pertains to embodiments depicted in Figs. 6A and 6B, which provide “a simplified flow diagram of a method for managing communication load.” Cole ¶ [0022]; *see also id.* ¶ [0083] (“Turning

now to FIGS. 6A and 6B, a simplified flow diagram of a method for responding to communication load is provided.”). Figs. 6A and 6B make clear that the flow chart is based on detecting sustained high load (item 600 in Fig. 6A). No item in the flow chart corresponds to determining or using the network connection type. This includes the decision of whether to prompt the user to find a better connection (item 650 in Fig. 6B), which is based on a load detection (items 600 in Fig. 6A) and a determination of whether there is an untried network (item 620 in Fig. 6A).

Although ¶ [0088] notes that the “lengthy transfer is conducted using the WWAN modem . . . which consumes significant battery power,” it does not suggest that the type of network connection (WWAN versus WLAN) is determined or used. And any determination based on battery usage is likewise agnostic to network connection type. *See* Cole ¶ [0088] (lengthy file transfer observed to “consume[] significant battery power” and request issued on that basis), ¶ [0087] (“determin[ing] if an acceptable network is available” “may entail determining if sufficient batter[y] power is present to complete the transaction”).

The connection manager will take the same action to conserve battery power regardless of whether the user is connected to WWAN or WLAN (different wireless network types). Further, Cole notes that any attempt to conserve battery power in the [0088] is secondary to managing connection load. *See id.* ¶ [0090] (“While, the load monitoring function of the connection manager 260 described in reference to

FIGS. 6A and 6B does attempt to conserve battery power, *it does so only under times of high load.*”). See Haas Decl. ¶ 90.

In ¶ [0089], Cole mentions “another example” of a scheduled synchronization of the user’s latest audio, video, and photo files. The Petition and Dr. McDaniel don’t rely on this separate example as meeting limitation [1.6]. This is because their theory for the limitation is based on file download (in ¶ [0088]) as the alleged first end-user application (*not* a scheduled synchronization). Regardless, any determination in ¶ [0089] for sending a user prompt is again based on the monitored load of the network connection, and not the connection type. See Cole ¶ [0089] (“The connection manager 260 ***notices the load*** from the synchronization operation and asks the user if it should be deferred (i.e., no better connection is available”). The connection manager may prompt the user to *resume* synchronization when a better connection is available (e.g., when plugged in to a LAN). *Id.* But there is no evidence that the decision to prompt the user or defer synchronization (the alleged “Internet access controls”) is based on the network device type (WWAN or WLAN or LAN).

The example in ¶ [0089] is also inapposite because it is about deferring synchronization between a wireless network (WLAN) and a wired network (LAN). Limitation [1.6] requires determining whether to apply particular access controls “based on *which of a plurality of wireless network types* is being used.” Thus, allegedly applying access controls differently between “wired” and “wireless”

networks would still not satisfy this requirement because it isn't determining which of a plurality of *wireless* network types is in use (e.g., cellular or Wi-Fi).

b. Not Applying an Internet Access Control

Second, the Petition's theory fails because "asking" a user to take certain action does not meet the plain meaning of "applying" an "access control" as set forth in limitations [1.6] and [1.7]. *See* Haas Decl. ¶¶93-77.1 At most, this functionality is *requesting* that the user itself apply an alleged control. In *Cole* ¶ [0088] any determination/decision is about whether to display a prompt to the user. After receiving the prompt, the user can ignore the request, cancel the file download, or pause and defer the download. But the prompt itself is not an action that "control[s]" Internet access. Notably, the Petition does not allege, and *Cole* does not disclose, that "ask[ing] the user to find a better connection" causes any change in application behavior, apart from manual actions that the user might take.

This functionality is inconsistent with the structure/requirements of the claim. Limitation [1.6] describes determining whether to apply Internet access controls. If the determination is yes, then controls are applied in limitation [1.7], as Dr. McDaniel agreed. *See* McDaniel Dep. at 53:8-21 ("the determination to whether apply [in limitation 1.6] would lead to a determination to apply the policy, and that's where 1.7 begins"), 55:13-56:5 ("So when the determination of 1.6 is complete and it's determined in the affirmative to apply policy, that's when -- moving on to 1.7 --

when the ‘one or more Internet activity access controls’ are to be applied.”). Thus, the determination in limitation [1.6] is whether to *apply* policy, **not** a determination whether to *request* the user to decide whether or not to apply a policy.

As Patent Owner’s expert Dr. Haas explained, the decision to *apply* a policy is different from, and cannot be satisfied, a decision to send a policy request. Haas Decl. ¶¶ 95-96. In the Cole example in ¶ [0087], the connection manager doesn’t make any policy decision. Rather, it sends a policy request to the user, and the user makes the policy decision. Even if the connection manager is involved in enforcing a policy, it does not itself make a policy decision as claim limitation 1.6 requires. Petitioner’s expert Dr. McDaniel admitted admitting that if the user can hit yes/no in a user interface prompt, then the user is making the policy decision “[u]nless the system decides to override the user’s wishes.” McDaniel Dep. at 31:2-17. Further, the ultimate decision of whether to apply the policy would not be based on the user’s yes/no—not on which of plurality of wireless device types is being used.

The Petition’s argument is also undermined by the context of claim 1. The claim requires “one or more *processors configured to*” determine whether to apply Internet access controls (in limitation [1.6]) and “apply[ing] the one or more Internet activity access controls” (in limitation [1.7]). The claim language implies that applying the Internet activity access controls is performed automatically by the processor after an affirmative determination of whether to apply the controls is

made. It does not imply an additional limitation between [1.6] and [1.7] that requires affirmative user input before limitation [1.7] can proceed. Further, the presence of a subsequent user input step (under the Petition's Cole theory) is inconsistent with the plain meaning of limitation [1.6], which is a complete yes/no determination about "whether [or not] *to apply*" the Internet access controls.

c. Inconsistent with Aggregating in Limitation [1.7]

The Petition's theory that Cole "teaches applying Internet access controls (asking the user to find a better connection)" based on wireless network type (Pet. at 29-30) is also inconsistent with its theory for limitation [1.7]. *See* Haas Decl. ¶¶ 98-99. Its theory for limitation [1.7] relies entirely on Rao, and the Petition never alleges that the alleged "Internet activity access control[]" of Cole (which is allegedly determined to be applied based on which of a plurality of wireless network types is being used) is "appl[ied] to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests."

Nor would any such argument (which has not been made) have any merit. This is because "asking a user to find a better connection" is entirely unrelated to the mechanisms in Rao that are alleged to aggregate network activity (e.g., queuing and prioritizing of packets). Further, asking the user to find a better connection at most is a policy about connecting to a different network. It is unrelated to the claimed

policy of limitation [1.7], which requires aggregating network activity associated with a first application with network activity for other applications.

2. Cole ¶¶ [0077-0078])

The Petition does not preserve any other argument based on Cole, but Dr. McDaniel attempts to do so in cursory fashion. He relies on a different example/embodiment of Cole in ¶¶ [0077-0078]. Dr. McDaniel asserts:

Cole teaches, “in response to a monitored load exceeding a capacity threshold,” the connection manager can “attempt to establish a connection with a higher bandwidth,” such as “a visible or invisible network 120 having higher capacity.” SAMSUNG-1006, [0077]. Cole further explains that if “the connection manager 260 can identify a more appropriate connection (e.g., by enabling the LAN device 240), the connection manager 260 switches to the larger pipeline by enabling the proper communication interface 225[.]”

McDaniel Decl. ¶ 109.

This theory fails for the same reasons discussed for the example at Cole ¶ [0087], as Dr. Haas explains. *See* Haas Decl. ¶¶ 101–107. *First*, there is no indication from Dr. McDaniel’s declaration or ¶¶ [0077-0078] that any action is taken “based at least on which of the plurality of wireless network types is to provide data communication,” as they do not reference any wireless network types at all. Instead, the action being discussed is taken “in response to a monitored load exceeding a

capacity threshold,” which, as discussed is a capacity of the connection. *See* Cole ¶¶ [0075-0076] (describing load as “exceed[ing] a predetermined threshold (e.g., 85% of capacity)”). The “monitored load exceeding a capacity threshold” is not shown or even alleged to have anything to do with the type of wireless network.

Second, the action is “attempt[ing] to establish a connection with a higher bandwidth,” but there is no evidence that this constitutes applying an Internet access control as required by claim limitations [1.6] and [1.7]. The claim does not describe switching to a new network connection or different connection type. Rather, claim1 contemplates maintaining the same network connection / type and applying control policies to Internet access requests.

The plain meaning of applying Internet access controls is not attempting to establish a connection with a higher bandwidth. Indeed, it reflects the opposite. Applying Internet access control implies a limit or reduction on network activities. But connecting to a higher bandwidth allows an increase to network activities. And it removes or reduces the need to apply Internet access controls. The functionality in ¶¶ [0077-0078] of Cole is thus fundamentally different from what Claim 1 describes. Instead of applying Internet access controls to the current connection, it is looking for a higher bandwidth connection instead of (or to avoid) applying access controls.

Third, Dr. McDaniel does not identify the alleged “first end user application” for the example at ¶¶ [0077-0078] of Cole. His theory for Cole’s example at ¶ [0088]

was based on file download as the alleged first end-user application. But for ¶¶ [0077-0078], no such first application articulated, and thus no obviousness theory for limitation [1.6] is shown.

Fourth, the example in ¶¶ [0077-0078] of Cole is about attempting to connect to a LAN. *See* Cole ¶ [0078] (“the connection manager 260 can identify a more appropriate connection (e.g., by enabling the LAN device 240)”). And even assuming Cole distinguished between WLAN and LAN in the example of ¶¶ [0077-0078] (it does not), that would still not meet the claim requirement. This is because limitation [1.6] requires a determination “based on *which of a plurality of wireless network types* is being used” (e.g., cellular or Wi-Fi). A determination that the system is not connected to a LAN, for example, is insufficient because it would not be based on a specific wireless network type.

Fifth, Dr. McDaniel’s theory is also inconsistent with his theory regarding claim limitation [1.7]. Limitation [1.7] requires aggregating network activity for the first Internet request with network activity for one or more other data communication requests. *See* Haas Decl. ¶¶ 105-107. But “attempting to establish a connection with a higher bandwidth” is unrelated to the mechanisms in Rao that are alleged to aggregate network activity (e.g., queuing and prioritizing of packets). At most, the policy in Cole is attempting to connect to a different network. this is unrelated to the

claimed policy of limitation [1.7], which requires aggregating network activity associated with a first application with activity for other applications.

VII. CLAIM LIMITATION [1.7]

The Petition fails to show that Rao in view of Cole (Rao-Cole) renders obvious claim limitation [1.7] of the '433 Patent.” Pet. at 30; McDaniel Decl. ¶ 110. But despite purporting to rely on the combination of Rao and Cole, the Petition relies exclusively on Rao for this limitation. *See* McDaniel Decl. ¶¶ 110-115. The Petition’s discussion of claim limitation [1.7] never mentions Cole or contains any citations to Cole. *See id.* The word “Cole” or any citations to Ex. 1006 (the Cole reference) do not appear in paragraphs 110-115 of Mr. McDaniel’s report.

Accordingly, the Petition and Mr. McDaniel’s theory is that Rao alone teaches or renders obvious limitation [1.7]. As discussed below, Dr. McDaniel fails to show that Rao teaches or renders obvious limitation [1.7] for at least four reasons. *See* Haas Decl. ¶¶ 110-141.

A. Requirements of Limitation [1.7]

Claim limitation [1.7] requires the claimed aggregation to (1) always occur, and (2) occur as a precondition to allowing network activity for the first Internet access request from a first application. *See id.* ¶¶ 110-114. Limitation [1.7] recites:

Identifier	Claim Language
[1.7]	when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests, which are otherwise not associated with the first end-user application, before allowing network activity in association with the first Internet access request.

Claim limitation [1.7] describes what happens “when” Internet activity access controls are applied “applied” (i.e. when the determination in claim limitation [1.6] is made). It describes applying Internet activity access controls “to aggregate” network activity for the “first Internet access request” with network activity for data communication requests from other applications, “before allowing” network activity for the “first Internet access request.” This is referred to above in the claim construction section above as the “claimed aggregation.”

Limitation [1.7] has at least two significant requirements. *First*, the claimed aggregation will always be performed (if an affirmative determination is made in limitation [1.6]). [1.7] recites that the processor will “apply [] access controls *to aggregate network activity . . .*” The claimed aggregation is not selective or optional but is instead the “one or more Internet activity access controls” being applied. If no aggregation occurs, then no access controls are applied and the determination in

limitation [1.6] must have negative (the processor determined to *not* apply Internet access controls to a first Internet access request by a first end user application).

Second, the claimed aggregation must occur “before allowing” network activity for the “first Internet access request.” Limitation [1.7] requires aggregating the network activity for the first request with network activity for other data communication requests as a precondition to allowing network activity for that first request. In other words, [1.7] *disallows* any network activity for the first Internet access request, *unless* it has been aggregated with network activity for other requests from other applications. Based on the plain meaning of [1.7], network activity for the first request cannot be performed if the claimed aggregation has not taken place.

This understanding of limitation [1.7] is supported by the specification, which teaches disallowing network activity until aggregation occurs is important because it reduces the frequency with which battery- and network-resource intensive changes in modem state such as “awakening the modem” or “changing the power state of the modem” need to occur. *See* '433 Patent (Ex. 1001) at 93:62-94:1 (“*[A] network service usage activity is prevented from awakening the modem [or] changing the power state of the modem . . . until multiple network service usage activities require such changes in modem state, or until network service usage activity is aggregated to increase network capacity and/or network resource utilization efficiency.*”). Thus, in the claimed invention, network activity for the first Internet access request is not

allowed (i.e., is prevented), *until* the network service usage activity is “aggregated” with other network service usage activities. *See id.* at 105:65-106:6 (“*aggregate network activity* for the first Internet access request with network activity for one or more other data communication requests . . . *before allowing* network activity in association with the first Internet access request”).

B. Rao Theory

The Petition and Dr. Daniel relies on Rao’s system for priority-based queuing of network packets for limitation [1.7]. Dr. McDaniel asserts that a POSITA would have been motivated to implement Rao’s system with “non-starvation” using Weighted Fair Queueing (WFQ). McDaniel Decl. ¶ 115; Pet at 32. “In such non-starvation techniques,” the Dr. McDaniel asserts, “network packets from lower-priority queues are aggregated with packets from higher priority queues before allowing packets from the lower-priority queue to flow.” McDaniel Decl. ¶ 115. Thus, according to Dr. McDaniel:

Rao teaches applying Internet activity access controls to aggregate network activity for the first Internet access request (from Rao’s second application) with network activity for one or more other data communication requests (from Rao’s first application), before allowing network activity in association with the first Internet access request (Rao’s second application).

Id.

The Petitioner's theory based on Rao is incorrect and unsupported. It fails to show that Rao teaches or renders obvious limitation [1.7] for at least four reasons. See Haas Decl. ¶¶ 117-141.

1. The Petition's Rao-based theory for limitation [1.7] is inconsistent with his Cole-based theory limitation [1.6].

As an initial matter, the Petition's Rao-based theory for claim limitation [1.7] is disconnected from and inconsistent with hits. Cole-based theory for limitation [1.6]. Limitation [1.6] recites determining whether to apply "one or more Internet activity access controls," and limitation recites applying "*the* one or more Internet activity access controls":

Identifier	Claim Language
[1.6]	<i>determine whether to apply the one or more Internet activity access controls</i> with respect to a first Internet access request by or on behalf of the first end-user application . . . and
[1.7]	<i>when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to</i> aggregate network activity for the first Internet access request with network activity for one or more other data communication requests . . .

Thus, the same "Internet activity access controls" must be determined in limitation [1.6] and applied in limitation [1.7]. After all, the claimed Internet activity access controls in limitation [1.7] takes antecedent basis from the same term in limitation [1.6]. Dr. McDaniel's Cole-based theory for limitation [1.6] rests on

Cole's disclosure of "asking the user to find a better connection" or "attempting to establish a connection with a higher bandwidth" as the alleged Internet activity access controls. But when it comes to limitation [1.7], the Petition points exclusively to Rao's priority-based queueing as the alleged Internet activity access controls. This is inconsistent with limitation [1.6] and the theory does not work. The Petition and is relying on different alleged controls to meet the same term in limitations [1.6] and [1.7], contrary to the requirements of the claim. *See* Haas Decl. ¶¶ 117-118.

Further, and relatedly, there is a direct causal relationship between limitations [1.6] and [1.7] that the Petition fails to account for. *Id.* ¶ 119. Limitation [1.6] is determining whether to apply something (access controls) and limitation [1.7] is applying the same thing (*the* access controls). Since the Petition points to different things, there is no direct causal relationship between determining whether to apply Cole's alleged controls for limitation [1.6] and applying Rao's alleged controls for limitation [1.7]. The determination of whether to apply Rao's priority-based is not (and cannot be) Cole's "asking the user to find a better connection" or "attempting to establish a connection with a higher bandwidth." And whatever that determination is, it is not alleged to satisfy limitation [1.6] under Dr. McDaniel's Cole-based theory. This further demonstrates that Dr. McDaniel's theory for limitation [1.7] does not work and fails to show obviousness.

2. Dr. McDaniel improperly treats the claimed aggregation of limitation [1.7] as selective or optional.

The Petition and Dr. McDaniel's theory also fails because it improperly treats the claimed aggregation as selective or optional when limitation [1.7] is performed. *See* Haas Decl. ¶¶ 120-125. Dr. McDaniel treats the claimed aggregation as optional or sometimes performed—even when the first part of limitation [1.7] (“when the one or more Internet activity access controls are to be applied . . .”) is satisfied.

Dr. McDaniel confirmed that he was interpreting and applying [1.7] this way. He testified that even if Internet access controls are applied in [1.7], aggregation is optional and may not occur. McDaniel Dep. at 57:4-19 (“Q: do you understand that the aggregation as recited in Claim 1.7 is performed every time, always, ‘when the one or more Internet activity access controls’ are to be applied? . . . A: So if you’re asking me that whenever ‘one or more Internet activity access controls’ are to be applied *aggregation must happen as a consequence, then the answer is no. Sometimes there’s aggregation and perhaps sometimes there’s not.*”).

The Petition and Dr. McDaniel's theory for how limitation [1.7] is met depends on this “sometimes” claim interpretation. Dr. McDaniel's theory is that requests are always allowed but the alleged aggregation may or may not occur depending on operational characteristics. McDaniel Decl. ¶ 115 (alleging that aggregation occurs in certain “non-starvation techniques” and only for packets from

lower-priority queues that are sent after packets from higher-priority queues). But this interpretation is unsupported and incorrect. Limitation [1.7] requires aggregation to be performed on each request to which Internet access controls are applied. This is apparent from the plain meaning of the limitation:

Identifier	Claim Language
[1.4]	one or more processors configured to . . .
[1.7]	when the one or more Internet activity access controls are to be applied, <i>apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests</i> , which are otherwise not associated with the first end-user application, <i>before allowing network activity in association with the first Internet access request.</i>

Limitation [1.7] thus recites a conditional, *if* “one or more Internet activity access controls are to be applied” (as determined in limitation [1.6]), *then* the processor must “apply [] access controls *to aggregate network activity* for the first Internet access request with network activity for one or more other [] requests.” The logical structure of this limitation is: “*If A, Then B.*” If A occurs, then B must necessarily occur. The claim does not say if A, then maybe or sometimes B. Accordingly, a system that allows A and not B (as in Dr. McDaniel’s theory that applies Internet activity access controls but sometimes has no aggregation) would violate this condition. As a matter of logic, the contrapositive of “*If A, Then B*” is

“*If Not B, Then Not A.*”³ Dr. McDaniel’s theory violates the contrapositive as well. It acknowledges many scenarios in which the system has *Not B* (no aggregation is performed) and *A* (Internet access controls are applied).

The requirements of limitation [1.7] are further supported by the broader context of claim 1, which recites processors “configured to” (i.e., programmed to) meet the conditional “*If A, Then B.*” But Dr. McDaniel’s system has *A* but may or may not have *B*. This demonstrates that the processor in Dr. McDaniel’s system is not programmed with the conditional. The processor may perform the actions of *A* and/or *B* individually. But the processor is not “configured to” perform the instruction of “*If A, Then B,*” as the plain meaning of limitation [1.7] requires.

3. Rao’s technique of priority-based queueing is not the claimed aggregation of limitation [1.7].

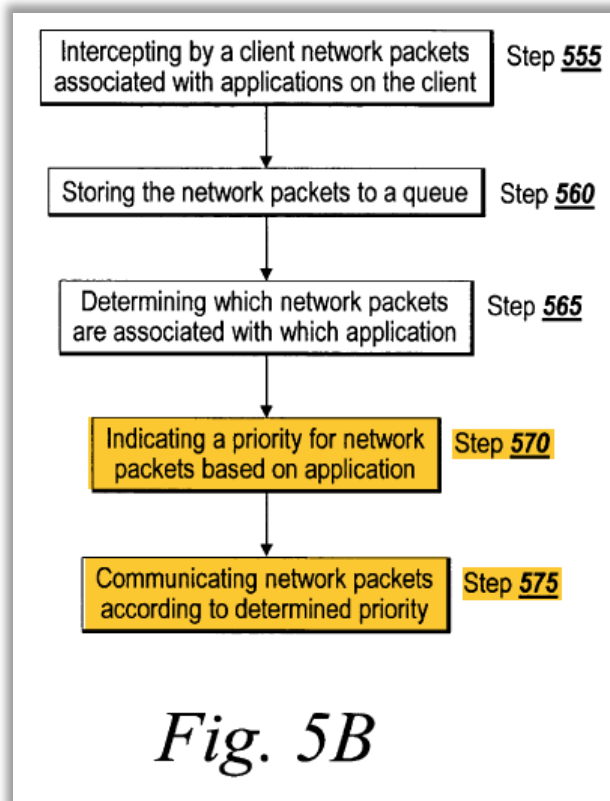
The Petition and Dr. McDaniel’s theory also fails because Rao’s technique of priority-based queueing is not, and would be considered, “aggregation” as required by limitation [1.7]. *See* HaasDecl. ¶¶ 126-135. The limitation requires “*aggregat[ing]* network activity for the first Internet access request with network activity for one or more other data . . . *before allowing* network activity in association with the first Internet access request.” Thus, the limitation *disallows* any network

³ Notably, the logical structure does not imply “If Not A, Then Not B.” If Not A (Internet access controls are not applied), then the claim is agnostic as to whether B occurs (whether the claimed aggregation is performed).

activity for the first Internet access request, unless and until it has been *aggregated* with network activity for other requests from other applications.

Rao's system for priority-based queueing of packets is materially different from—and fails to satisfy—the claimed “aggregation.” Indeed, in limitation [1.7], the claimed aggregation results in disallowance of the first Internet access request for an indefinite period (unless the first request is aggregated with network activity for other applications, and the network activity for other applications are requested). But there's no evidence that Rao's alleged functionality of queueing and prioritizing network packets constitutes *disallowance* until aggregation has occurred.

To the contrary, Rao's priority techniques *allow* packets from the first application to be transmitted in all cases; Rao merely *de-prioritizes* those packets behind one or more higher priority packets (if there happen to be any). Where there are no other higher priority packets, the packets from the first application are transmitted immediately. Indeed, Rao contemplates that *all* packets assigned a priority will be transmitted. This is confirmed, for example, by Rao's Fig. 5B, which shows that after network packets are assigned a priority based on application (in step 570), those packets are then communicated over the network (in step 575):



Rao (Ex. 1005) at Fig. 5B (annotated).

Rao's claims also make clear that even when a packet may have lower priority than other packets, the lower-priority packet will nevertheless be communicated over the network. *See id.* at claim 4 (only preventing a lower-priority packet from being communicated "*ahead of*" higher priority packets); *id.* at claim 5 (discussing "holding" a deprioritized network packet, and then "releasing" that hold "upon communication" of certain higher priority packets). This is further confirmed because Rao teaches assignment of priority involves at least *some* (non-zero) level

of priority. *See id.* ¶[0180] (referring to “levels of priority, such as high, medium, low, or numerically such as priority 1 . . . 10”) (ellipses in original).

Thus, at most, and only under certain circumstances, Rao’s system temporarily *delays* certain network packets associated with the first application. *See* Haas Decl. ¶¶ 129-130. But this does not meet the plain meaning of limitation [1.7], which requires aggregation and potentially permanent disallowance (unless and until the aggregated network activity is requested). And any argument that temporarily delaying packets for priority queuing is equivalent to aggregation and disallowance is inconsistent with the ’433 Patent. For example, the specification distinguishes “block[ing]” access from less drastic remedies that apply to individual network packets, such as delaying traffic by putting that traffic into lower-priority queues. ’433 Patent at 13:21-25, 55:58-62, 92:9-19. Further, the ’433 Patent describes “allow/block” as a separate operation from “queue” or “defer” and clarifies that blocking access can apply to the network connection rather than at the level of individual packets. *Id.* at 91:41-49, 92:9-19, 102:23-37 (traffic control includes “block[ing]” the application “such that the network service consuming application is prevented from consuming any [network] resources”).

A non-technical analogy serves to illustrate the difference between aggregation and prioritization. *See* Haas Decl. ¶¶ 132-135. Suppose that two people, Smith and Jones, are engaged in letter correspondence regarding business matters.

Smith intends to send Jones a short note regarding Smith's family vacation but decides that the note is not worth a separate letter (and corresponding postage and driving to the post office, etc.). Thus, Smith decides to append the vacation note to the next business letter that will be sent. The business letter may not be sent for several more weeks or months (if ever). And if the business correspondence stops, then the note about Smith's family vacation will never be sent. This was part of Smith's initial decision that the family vacation note was not by itself worth sending and that it should only be included as part of a business letter that would otherwise be sent. In this example, the family vacation note is "aggregated" with business correspondence and "disallowed" unless/until the business correspondence is sent.

In contrast, prioritizing or sorting is different. Smith and Jones are engaged in business correspondence. Smith intend to send Jones a note about family vacation and decides that the note will be sent in a separate letter. Smith writes the personal letter, puts it in an envelope with a stamp, and the letter is ready to go. The family vacation note will be sent; Smith merely prioritizes / sorts it behind other pending business correspondence. If Smith has a business letter to Jones, the business letter will be sent first, followed by the personal letter. If the business correspondence stops, the personal letter will nonetheless be sent. In this example, the family vacation note is prioritized behind business correspondence, and not "aggregated" or disallowed.

The foregoing analogy illustrates the difference between the claimed aggregation in limitation [1.7] and Rao's priority-based queueing technique. The two are materially different, and the difference is further highlighted by how they apply Internet access controls to requests from a first application. Under limitation [1.7], the requests are aggregated with requests from other applications, and disallowed indefinitely. If no other applications are running, then no network activity is allowed, and the modem remains asleep or off. In contrast, when Rao applies Internet access controls (as alleged by Dr. McDaniel) to a first application and no other applications are running, then no aggregation occurs. Network activity for the first application will always and immediately be allowed. The modem would be awakened, and resources would be consumed.

Thus, in many (if not most) scenarios, Rao's priority-based queueing would operate different and have the opposite effect from the claimed aggregation. Rao's system would immediately or promptly allow network activity for the first application, with no efficiency savings for the modem. In contrast, the '433 Patent would block network activity for the first application, until other network activity is requested. This increases efficiency by unnecessary power cycling of the modem.

A practical examination of the difference between a short-term temporary delay to process other traffic and what limitation [1.7] further undermines the Petition and Dr. McDaniel's argument. *See* Haas Decl. ¶ 135. In practice, the first

application could be aggregated with other applications that are turned off or in the background for an indefinite period (weeks or months). In this case, an implementation of limitation [1.7] would result in Internet service activity on behalf of the first end-user application disallowed indefinitely. This is completely different from just the very short period required to send the traffic of a different application under Mr. McDaniel's theory for Rao's priority-based queueing.

4. Dr. McDaniel's mapping of the claimed aggregation is unsupported and arbitrary.

The Petition and Dr. McDaniel's theory also fails because it depends on an unsupported and arbitrary characterization of certain packets as "aggregated" with other packets. *See* Haas Decl. ¶¶ 136-143. Under Dr. McDaniel's theory, Rao may or may not perform the alleged "aggregation" for a request, but Rao teaches that it will *always* allow (i.e., attempts to transmit) network activity for that request. This is apparent from the Dr. McDaniel's declaration and the Petition. Dr. McDaniel asserts that Rao meets claim limitation [1.7] when it sends "a set of higher priority packets, followed by a followed by a smaller set of lower priority packets, followed by more higher priority packets, and so on." McDaniel Decl. ¶ 115.

For illustrative purposes, assume that there is a stream of 10 data packets that are generated for transmission by a client device in Rao. Dr. McDaniel alleges that in Rao an "Internet access request" corresponds to a packet. Now consider how

Rao's system processes the 10 packets in the example. All 10 packets will be transmitted and Rao's system at most re-arranges or sorts the order of the 10 packets. Dr. McDaniel does not allege that each of the 10 packets is aggregated. Rather, Dr. McDaniel's theory is that only the "smaller set" of lower priority packets is aggregated with the preceding higher priority packets.

But in this example, network activity is always allowed for each of the 10 packets (regardless of whether or not a particular packet is "aggregated" according to Dr. McDaniel). After all, Dr. McDaniel does not allege, and Rao does not teach, that any packet should be discarded and *not* transmitted under those circumstances. This shows that in Rao's system, any alleged aggregation is not a pre-condition to allowing network activity.

This is inconsistent with the requirements of Claim 1, which requires a system "configured to . . . aggregate network activity for the first Internet access request with network activity for one or more other data communication requests . . . *before allowing* network activity in association with the first Internet access request." Rather, in Rao's system, allowance of network activity in association with the first Internet access request *always* occurs irrespective of whether that activity was previously aggregated with network activity for other data communication requests.

In this manner, Rao's system simply operates to prioritize certain packets over others, without concern for holding or delaying transmission of traffic more generally. But the '433 Patent expressly distinguishes between "priority queuing relative to other device traffic" and "hold[ing] or delay[ing] traffic while accumulating or aggregating traffic into a larger stream/burst/packet/group of packets." Ex. 1001 at 86:6-11. This makes sense, because only the latter solution is able to achieve the stated benefit of reducing resource-intensive changes in modem state. *See id.* at 93:62-94:1 ("***[A] network service usage activity is prevented from awakening the modem [or] changing the power state of the modem ... until multiple network service usage activities require such changes in modem state, or until network service usage activity is aggregated*** to increase network capacity and/or network resource utilization efficiency.>"). Accordingly, the '433 Patent specification itself distinguishes the claimed invention (which ensures that aggregation occurs before network activity for a specific access request is allowed) from solutions such as Rao's priority queuing system.

Dr. McDaniel's characterization of what is aggregated is also arbitrary. *See* Haas Decl. ¶¶ 140-141. For example, consider Rao's system transmitting a stream of 10 packets. In that stream of 10 packets, it is possible to identify 44 different groupings of (at least two) sequential packets (e.g., one continuous sequence of 10 packets, two sequences of 9 packets, three of 8, four of 7, five of 6, six of 5, seven

of 4, eight of 3, and nine of 2). Dr. McDaniel appears to imply that any (or all) these 44 combinations could be considered an aggregation, simply because you could draw a box around those packets in the data stream that is transmitted. And he relies on certain arbitrary boxes he draws as meeting the claimed aggregation.

This is unsupported and arbitrary. A POSITA would not consider Dr. McDaniel's purported boxes to be an aggregation simply because the packets ultimately transmitted in that order. *See* Haas Decl. ¶141. Not would a POSITA consider all 44 combinations to each represent an aggregation, as Dr. McDaniel implies. Instead, the most that Rao's system shows is some prioritizing or sorting technique that affects the order in which packets are transmitted. No aggregation is occurring. Aggregation implies that units are organized into a group, e.g., with a common characteristic or function. Rao lacks any such organization, because the packets are transmitted one-by-one, and it does not block or hold any packets as a group. In contrast, the '433 Patent does perform aggregation, by disallowing (blocking) network activity for the first request until network activity for other requests is allowed.

VIII. OTHER CHALLENGED CLAIMS

As discussed above, Petitioner fails to show that Rao-Cole renders obvious claim limitations [1.6] and [1.7] for several dispositive reasons. For any of these reasons, Petitioner fails to prove that claim 1 is unpatentable under Ground 1A.

The same deficiencies apply to all grounds and all challenged claims. For Ground 1A, the challenged claims are Claims 1-3, 6, 10-11, and 13-14. Claim 1 is the only independent claim, and the other challenged claims all depend from claim 1. Likewise, Grounds 1B, 1C, 1D, and 1E challenge certain dependent claims (Claims 2-5, 7-9, 12, 15-16, 18-20) based on the combination of an additional secondary reference (Freund, Singh, Montemurro, or Gandhi). *See Pet.* at 1. These dependent claims depend from claim 1 as well.

The Petition's theories for dependent claims 2-20 rely only on its theories for independent claim 1 to allege that the elements of claim 1 are met. They do not contain any additional arguments or evidence for the limitations of claim 1 in the dependent claims. Accordingly, the Petition fails to prove that any challenged claim (claims 1-20) is unpatentable under any ground (Grounds 1A-1E).

IX. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board affirm the validity of all challenged claims 1-20 of the '433 Patent.

Date: July 2, 2024

Respectfully submitted,

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CERTIFICATION REGARDING WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), I certify that there are 12,382 words in the paper excluding the portions exempted under 37 C.F.R. §42.24(a)(1).

Date: July 2, 2023

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(1), I certify that the above document was served on July 2, 2024, by filing this document through the Patent Trial and Appeal Case Tracking System as well as delivering a copy via electronic mail upon the following attorneys of record for the Petitioner:

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