

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO. LTD.,  
Petitioner,

v.

HEADWATER RESEARCH LLC,  
Patent Owner.

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IPR2023-01336  
Patent 9,137,701 B2

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Before ROBERT J. WEINSCHENK, GARTH D. BAER, and  
STEPHEN E. BELISLE, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

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

## I. INTRODUCTION

### A. Background

Samsung Electronics Co., Ltd. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–25 (the “challenged claims”) of U.S. Patent No. 9,137,701 B2 (Ex. 1001, “the ’701 patent”). Paper 2, 1 (“Pet.”). Headwater Research LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to Patent Owner’s Preliminary Response (Paper 7, “Pet. Reply”) and Patent Owner filed a Sur-reply (Paper 8, “PO Sur-reply”).

Under 35 U.S.C. § 314, an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Upon consideration of the Petition in view of the present record and for the reasons explained below, we determine that Petitioner has shown a reasonable likelihood of prevailing with respect to at least one of the challenged claims. Accordingly, we institute an *inter partes* review on all grounds set forth in the Petition. *See* 37 C.F.R. § 42.108(a).

### B. Related Proceedings

The parties identify the following related matter: *Headwater Research LLC v. Samsung Electronics Co., Ltd.*, 2:22-cv-00422 (E.D. Tex.). Pet. 80; Paper 4, 1–2.

### C. The ’701 Patent (Ex. 1001)

The ’701 patent is directed to differentiated network access for background and foreground applications. Ex. 1001, code (54). The patent describes a system that “analyzes traffic from [a] network service consuming application,” and “categorize[s] the traffic” based on various criteria

including “whether the particular service usage activity is in foreground of user interaction or in the background of user interaction.” *Id.* at 100:59–60, 101:20–25. The system includes a “differential access control engine that can restrict network access of a particular service usage activity when a condition is satisfied, such as when the service usage activity is a background activity.” *Id.* at 102:12–15.

*D. Illustrative Claim*

Claim 1 is the sole challenged independent claim. Claim 1 is reproduced below, with numbering added.

[1pre] A wireless end-user device, comprising:

[1a] 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 WWAN;

[1b] a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN;

[1c] one or more processors configured to

[1d] determine, for a first end-user application capable of running in a background state and capable of running as a foreground application, whether the application is running in a background state or as a foreground application, and

[1e] control, via an application program interface (API), application access for Internet service activities provided through the WWAN modem and the WLAN modem, to, based on a first differential traffic control policy, selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN,

[1f], [1g] wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.

Ex. 1001, 105:50–106:11.

*E. Asserted Grounds of Unpatentability*

Petitioner asserts the following grounds of unpatentability. Pet. 1.

| Claims Challenged                  | 35 U.S.C. § <sup>1</sup> | References/Basis                        |
|------------------------------------|--------------------------|-----------------------------------------|
| 1–4, 9, 10, 13, 14, 16, 19, 20, 25 | 103                      | Rao, <sup>2</sup> Oestvall <sup>3</sup> |
| 5–8, 11, 17, 18, 23, 24            | 103                      | Rao, Oestvall, Montemurro <sup>4</sup>  |
| 12, 15, 21, 22                     | 103                      | Rao, Oestvall, Araujo <sup>5</sup>      |

Petitioner submits a declaration from Patrick McDaniel. Ex. 1003.

## II. DISCUSSION

*A. Discretion under 35 U.S.C. § 325(d)*

Patent Owner contends we should deny institution under 35 U.S.C. § 325(d) because the same or substantially the same prior art or arguments previously were presented to the Office. Prelim. Resp. 28–47. Specifically, Patent Owner asserts that of the two references asserted against claim 1, one—Rao—is nearly identical to a close relative that was cited in the patent’s prosecution history and the other—Oestvall—is cumulative of Rao,

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<sup>1</sup> The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. § 103 that became effective after the filing of the application that led to the challenged patent.

<sup>2</sup> US 2006/0039354 A1, Pub. Feb. 23, 2006 (Ex. 1005, “Rao”).

<sup>3</sup> US 2007/0038763 A1, Pub. Feb. 15, 2007 (Ex. 1006, “Oestvall”).

<sup>4</sup> US 2009/0207817 A1, Pub. Aug. 20 2009 (Ex. 1007, “Montemurro”).

<sup>5</sup> US 2009/0217065 A1, Pub. Aug. 27, 2009 (Ex. 1011, “Araujo”).

Judge, and Nicolas, which were also before the Examiner. *See* Prelim. Resp. 30–45. For the reasons given below, we are not persuaded to exercise our discretion to deny the Petition based on § 325(d).

In evaluating arguments under § 325(d), we use a two-part framework: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential).

Here, Petitioner relies on Oestvall, a reference that was not before the examiner, for teaching limitation [1f], which requires “access is selectively blocked based on a determination that the first end-user application is running in a background state.” Pet. 34–35. We disagree with Patent Owner that Oestvall is cumulative of Rao and Judge. *See* Prelim. Resp. 37–39; PO Sur-reply 3 n.2. First, Oestvall is substantively different because it teaches the at-issue limitation in a single reference as compared to Rao and Judge, which, even according to Patent Owner, must be combined to fully address limitation [1f]. *See* Prelim. Resp. 36, 38; PO Sur-reply 3 n.2. Next, Oestvall’s selectively-blocking teaching is not cumulative of Judge’s same teaching as Patent Owner contends because Oestvall more clearly teaches that feature. *See* Prelim. Resp. 38–39. Specifically, Oestvall teaches “send[ing] a control signal” that “prevents an untrusted [background] application from running.” Ex. 1006 ¶ 23. Judge’s relevant disclosure, in

contrast, teaches “choos[ing] to only support a subset of applications.” Prelim. Resp. 39 (citing Ex. 2005 ¶ 49). Because Oestvall more clearly teaches the claimed access blocking, Patent Owner has not shown that part one of the *Advanced Bionics* framework is met.

In addition, Petitioner has sufficiently shown under part two of the *Advanced Bionics* framework that the Office materially erred when it allowed the challenged claims. As *Advanced Bionics* explains, the record developed by the Office informs what the petitioner must show to demonstrate the Office materially erred. *Advanced Bionics*, Paper 6 at 10. With respect to Rao, Judge, and Nicolas, the record developed by the Office is sparse because Rao was one of well over a thousand references identified in information disclosure sheets but never discussed substantively during prosecution. Pet. Reply 4; Ex. 1002, Ex. 1001, code (56). Although the Examiner acknowledged Judge and Nicolas as “[p]rior art [that] was found,” the Examiner never discussed either reference substantively. Ex. 1002, 322. In light of the sparse record, Petitioner’s showing on the merits is enough to demonstrate that the examiner erred. Specifically, to the extent the examiner substantively considered Rao and references cumulative of Oestvall as a combination and concluded that combination does not teach claim 1, the examiner materially erred. Instead, for the reasons outlined below, the asserted combination teaches claim 1. Given the Petition’s analysis and the sparse record developed by the Office addressing the Petition’s asserted references, Petitioner has sufficiently shown under part two of the *Advanced Bionics* framework that the Office materially erred when it found the prior art does not teach claim 1.

For these reasons, we decline to exercise our discretion to deny the Petition based on § 325(d).

*B. Claim Construction*

In an *inter partes* review proceeding, we construe patent claims using the same standard used in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of the claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b). Neither party proposes an express construction for any claim terms. Pet. 3; *see generally* Prelim. Resp. 8. We agree that no claim terms require express construction for purposes of this Decision.

*C. Level of Ordinary Skill in the Art*

Petitioner contends a person of ordinary skill in the art at the time of the invention “would have had (1) at least a bachelor’s degree in computer science, computer engineering, 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,” and that “[a]dditional graduate education could substitute for professional experience, and *vice versa*.” Ex. 1003 ¶ 18. Patent Owner does not challenge Petitioner’s definition at this stage of the proceeding. Prelim. Resp. 6. On this record, we agree with Petitioner’s definition.

*D. Description of Primary Prior Art References*

*1. Rao (Ex. 1005)*

Rao is titled “Systems and Method for Client-Side Application-Aware Prioritization of Network Communications” and “is generally directed towards a remote access architecture for providing peer-to-peer

communications and remote access connectivity.” Ex. 1005, codes (54), (57).

Rao’s Figure 1A, reproduced below, illustrates a system for deploying an exemplary remote access architecture. Ex. 1005 ¶ 86.

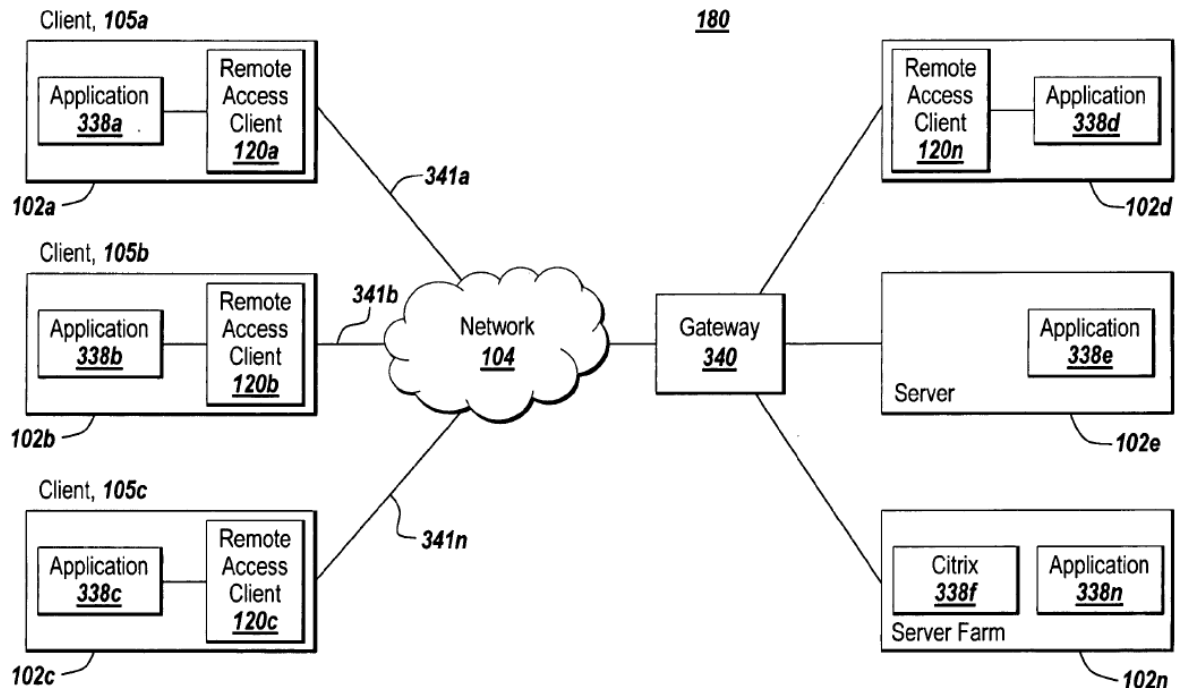


*Fig. 1A*

Figure 1A shows that environment 180 includes a number of computing devices 102a–102c, also referred to as clients 105a–105c, connected to network 104. *Id.* ¶ 86, Fig. 1A. Clients 105a–105c may communicate with server 102a, server farm 102e, or peer computing devices 102d via network 104 and gateway 340. *Id.*

Clients 105a–105c include respective remote access clients 120a–120c (Ex. 1005 ¶ 87, Fig. 1A), an example of which is shown in more detail in Figure 1C, reproduced below.

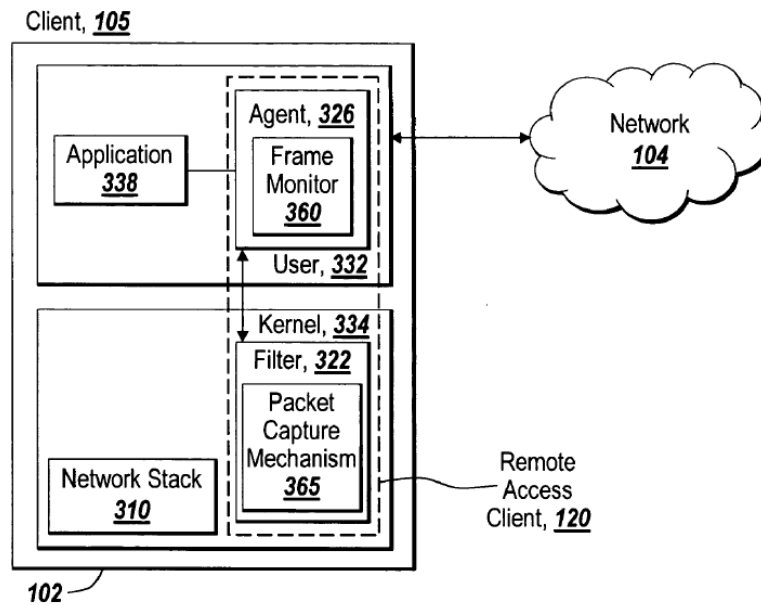


*Fig. 1C*

Figure 1C shows computing device 102, also referred to as client 105, as including remote access client 120 for routing network packets to network 104. *Id.* ¶ 99, Fig. 1C. Computing device 102 may also include network interface 118 (not shown in Figure 1C) for interfacing with “a Local Area Network (LAN), Wide Area Network (WAN) or the Internet through a variety of connections including . . . LAN or WAN links . . . wireless connections, or some combination of any or all of the above.” *Id.* ¶ 125. “[N]etwork interface 118 may comprise a . . . modem or any other device suitable for interfacing the computing device 102 to any type of network.” *Id.* “[R]emote access client 120 may be used to practice one or more of the optimization techniques” Rao describes, such as “optimizing any real-time data communications, such as VoIP, desktop sharing, or web conferences.” *Id.* ¶ 117.

Figure 5A of Rao shows a more detailed illustration of computing device 102, also referred to as client 105, for use in “client-side application-aware network communication prioritization techniques.” Ex. 1005 ¶ 179.

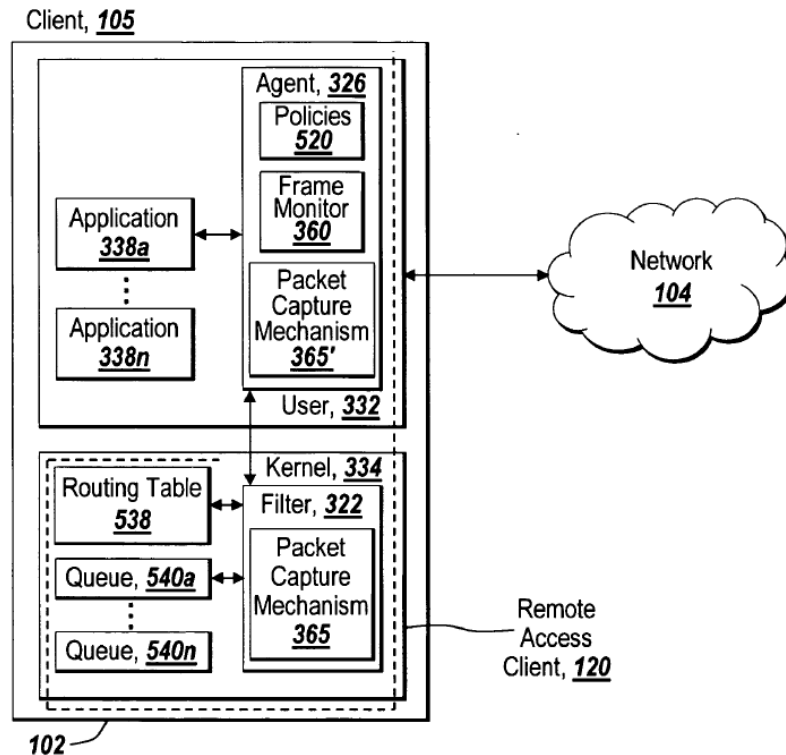


*Fig. 5A*

In particular, as shown in Figure 5A, “remote access client 120 may have one or more policies 520 for specifying client-side prioritization of network communications related to applications 338a-338n.” *Id.* ¶ 182, Fig. 5A. In an embodiment, “policies 520 may be specified in accordance to the type of one or more protocols used by the applications 338a-338n and/or the size of the payload of the network packet.” *Id.* In operation, client 105 may intercept network packets associated with an application 338a-338n and store the packets in one of queues 540a–540n, where a priority is determined

for the packets based on the type and/or priority of the application with which the packets are associated. *Id.* ¶ 184. “[A]ll network packets for a type of application 338a-338n, such as an email or voice application, or all network packets for a type of protocol used by the application 338a-338n, such as RPT or UDP, may be placed in a queue 540a-540n for prioritizing network[] packets for one or more applications.” *Id.* ¶ 192.

2. *Oestvall (Ex. 1006)*

Oestvall is titled “Method of Enabling a Multitasking Computing Device to Conserve Resources” and relates to preserving battery power in a computing device “by determining if an untrusted application is in the background or foreground and preventing an untrusted application that is in the background from running.” Ex. 1006, codes (54), (57). Oestvall observes that “[b]attery conservation in battery operated computing devices is very important, particularly in devices such as smartphones that consume high power levels by virtue of connecting to always-on GPRS or 3G cellular networks.” *Id.* ¶ 4. In a multi-tasking computer device, however, “without an explicit ‘close’ command, applications will continue to run even when not actually in active use; they will therefore continue to use some system resources, even when residing in the ‘background.’” *Id.* ¶ 6.

Accordingly, Oestvall describes “denying system resources and services to background applications that do not meet predefined ‘trust’ or certification criteria—i.e. criteria which define the level of trustworthiness of the application.” Ex. 1006 ¶ 10. As Oestvall notes, “untrusted” applications are “more likely to contain a wrong implementation of normal background behaviour: hence, merely relying on an application to voluntarily cease running when notified that it is in the background is an inadequate strategy

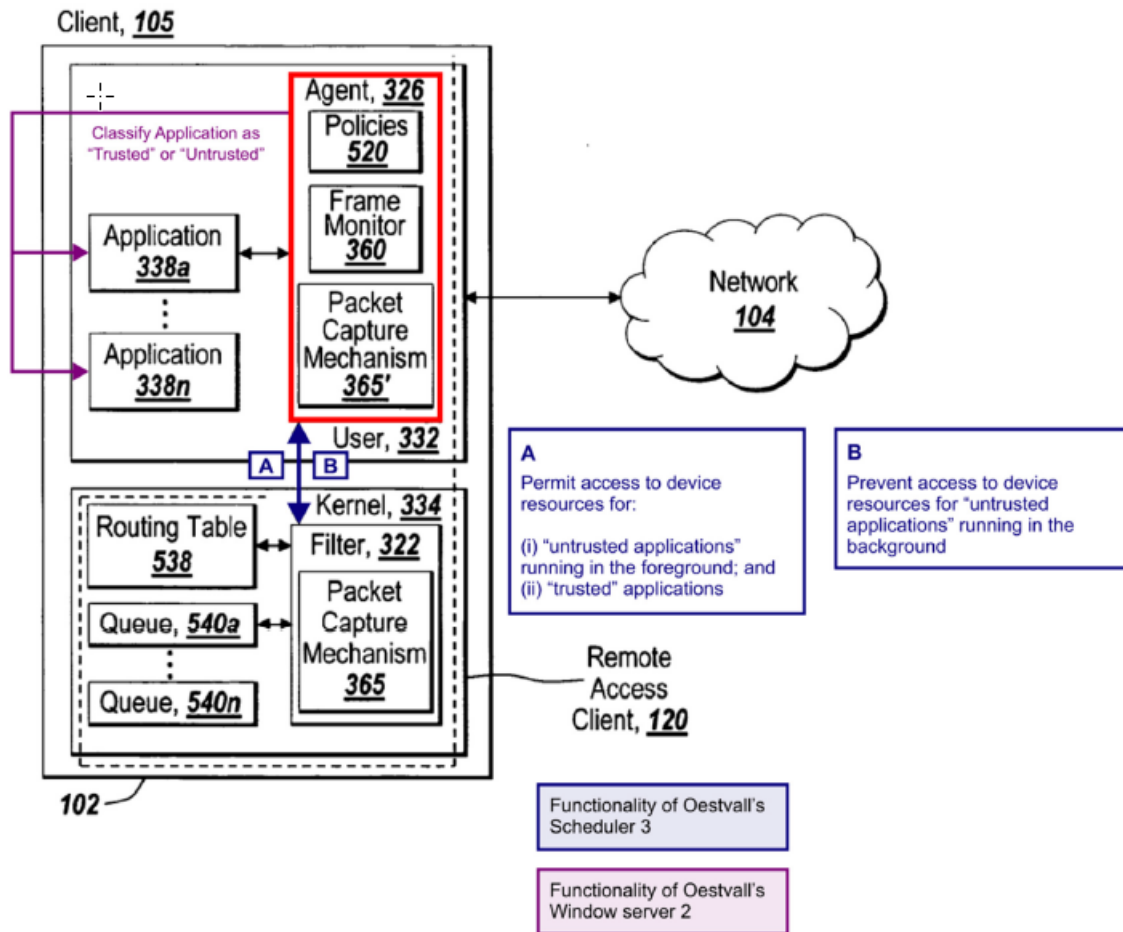
for untrusted applications.” *Id.* ¶ 14. Therefore, in Oestvall’s method, “when an untrusted application is running on the battery operated device and another application should be in the foreground, the untrusted application is placed into the background and is also actively prevented from running.” *Id.* ¶ 21.

*E. Obviousness Analysis*

In challenging claims 1–25, Petitioner relies primarily on Rao and Oestvall. *See* Pet. 16–77.<sup>6</sup> Petitioner’s proposed combination of Rao and Oestvall is reproduced below.

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<sup>6</sup> Petitioner adds Montemurro or Araujo only to address additional limitations in dependent claims 5–8, 11, 12, 15, 17, 18, and 21–24. *Id.* at 47–77.



### Rao-Oestvall

*Id.* at 14. Specifically, according to Petitioner, Rao teaches claim 1's wireless device, WLAN, and processor. *See id.* at 16–18. In addition, Petitioner explains, Rao teaches determining whether an application is running in the foreground or background, and making network-access priority determinations based on that determination. *Id.* at 12, 19–21. Petitioner relies on Oestvall for teaching blocking or allowing an application's access to the WWAN modem for applications based on a foreground/background determination. *Id.* at 29–30. According to Petitioner, a skilled artisan would have found it advantageous to implement Oestvall's blocking technique in Rao's system "to reduce battery

consumption when the device is connected to . . . cellular networks.” *Id.* at 31–32.

Patent Owner raises several arguments to contest Petitioner’s obviousness challenge. We address those arguments below.

*1. Elements [1e] and [1f]*

Claim element [1e] requires “based on a first differential traffic control policy, selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection.”

Ex. 1005, 105:67–106:5. Claim element [1f] adds “wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.” *Id.* at 106:6–12.

Petitioner asserts that Rao teaches differential traffic control policies because “Rao’s remote access client 120 in the device 102 has ‘one or more policies 520 for specifying client-side prioritization of network communications related to applications.’” *Id.* at 26 (quoting Ex. 1005 ¶ 182). Further, according to Petitioner, Oestvall teaches the claimed blocking of background applications’ modem access because Oestvall regulates applications’ access to resources depending on whether the application runs in the background or foreground. *Id.* at 29 (citing Ex. 1006 ¶ 23); *see id.* at 34.

*2. Rao’s Alleged Deficiencies*

In contesting obviousness, Patent Owner asserts that Rao fails to teach several aspects of elements [1e] and [1f]. *See* Prelim. Resp. 7–25. First, Patent Owner contends that Rao discards packets “during a network

disruption,” but not “‘at a time when data for Internet service activities is communicated through a WWAN modem’ as required by claim limitation [1e].” *Id.* at 10–11. Next, Patent Owner asserts that the alleged application-packet blocking in Rao is based on a packet’s content, protocols, or destination address, but “[n]one of these are based in any part on whether an application is running in the background (as Claim 1 requires).” *Id.* at 13. Patent Owner contends further that the claimed access blocking “is contrary” to Rao’s queuing/prioritizing process. *Id.* at 15–17; *see id.* at 21 (asserting that “Rao’s disclosed process of *queuing* and *prioritizing* packets . . . ensures adequate resources for high-priority packets while allowing the lower-priority packets to not be discarded but to rather be transmitted at a later time”). *Id.* at 21. Last, Patent Owner asserts Rao is deficient because “Rao teaches that individual packets are discarded while the application *maintains* access to the modem, and without taking the drastic step of *blocking* access by the application to the WWAN modem.” *Id.* at 23.

We disagree with these arguments because they attack Rao individually, rather than the combined teachings of Rao and Oestvall that are asserted in the Petition. As Petitioner explains, Oestvall teaches the claimed selective blocking because “Oestvall’s device prevents the application from ‘being given any services or consuming any resources,’ so a POSITA would have understood and found obvious that such prevention would block the application’s access to network resources (e.g., WWAN modem).” Pet. 29 (quoting Ex. 1006 ¶ 23). In addition, “Oestvall describes that its scheduler regulates access to resources by an untrusted application depending on whether the application runs in the background or foreground.” *Id.* at 29. Petitioner also explains why a skilled artisan would have been motivated to

employ Oestvall’s blocking strategy in Rao—“to increase device efficiency where device operation increases battery consumption, such as when the device is engaged in network activity over a WWAN network.” *Id.* at 31. Thus, even if Patent Owner is correct in its characterizations of Rao, those arguments do not ultimately undermine obviousness because Petitioner adequately explains how Oestvall teaches the features allegedly missing in Rao.

### 3. *Oestvall’s Alleged Deficiencies*

Next, Patent Owner asserts Oestvall is deficient because in Oestvall, “[a]ny loss in network connectivity is simply the result of shutting off all system resources, and not the result of applying any sort of differential traffic control policy,” as claim 1 requires. Prelim. Resp. 26. We disagree with this argument because it again attacks the references individually, rather than the combined teachings of Rao and Oestvall that Petitioner asserts. Specifically, it does not matter if Oestvall fails to teach applying differential traffic control policies as Patent Owner argues because Petitioner relies on Rao, not Oestvall, for that feature. *See* Pet. 25–26 (asserting that Rao’s policies 520 teach the differential traffic control policies).

Based on Petitioner’s analysis as outlined above, we agree with Petitioner that the combined Rao-Oestvall system teaches claim elements [1e] and [1f]. In addition, given Petitioner’s explanation that Oestvall’s selective blocking would impact battery consumption and therefore increase efficiency, *see* Pet. 13, 31, Petitioner has articulated sufficient reasoning with rational underpinning to support the legal conclusion that its proffered combination would have been obvious. *See KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

4. *Summary*

Other than as outlined above, Patent Owner does not additionally challenge Petitioner's obviousness contentions. We have reviewed Petitioner's arguments and the underlying evidence cited in support and are persuaded that, at this stage, Petitioner sufficiently demonstrates a reasonable likelihood of succeeding in its challenges to claims 1–25.

III. CONCLUSION

After considering the evidence and arguments presented in the current record, we determine that Petitioner has demonstrated a reasonable likelihood of success in proving that at least one of the challenged claims of the '701 patent is unpatentable. We therefore institute trial on all challenged claims and grounds raised in the Petition. At this stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim or as to the construction of any claim term. Any final determination will be based on the record developed during trial.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–25 of the '701 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '701 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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