

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**TWILIO INC.,**  
*Appellant*

v.

**TELESIGN CORPORATION,**  
*Appellee*

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2019-1842, 2019-1843

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Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2017-01976, IPR2017-01977.

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Decided: June 10, 2020

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JESSE J. CAMACHO, Shook, Hardy & Bacon, LLP, Kansas City, MO, for appellee. Also represented by CHRISTINE A. GUASTELLO, MARY PEAL.

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Before MOORE, O'MALLEY, and HUGHES, *Circuit Judges*.

MOORE, *Circuit Judge*.

Twilio Inc. appeals the Patent Trial and Appeal Board's *inter partes* review decisions holding claims 1–3, 5, 14, 16, 17, and 19 of U.S. Patent No. 8,755,376 and claims 1–6, 9, and 13 of U.S. Patent No. 8,837,465 unpatentable as obvious. Because the Board's decisions were not erroneous and substantial evidence supports its findings, we *affirm*.

The '376 and '465 patents relate to systems and methods for processing telephony sessions that involve communicating with an application server and accessing call router resources through an application programming interface (API). See '376 patent at 1:60–66; '465 patent at 1:60–66. The Board held that the combination of U.S. Patent No. 6,801,604 (Maes) and U.S. Patent Pub. No. 2003/0204756 (Ransom) rendered the challenged claims unpatentable as obvious.<sup>1</sup> Twilio appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

#### DISCUSSION

We review the Board's factual determinations for substantial evidence and its legal determinations de novo. *Outdry Techs. Corp. v. Geox S.p.A.*, 859 F.3d 1364, 1367 (Fed. Cir. 2017). Obviousness is a question of law, which is based on underlying factual findings. *Id.* We review the Board's procedures for compliance with the Administrative Procedure Act (APA) de novo, and we must set aside Board

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<sup>1</sup> Telesign's petition challenging the '376 patent claims included a third reference—U.S. Patent No. 7,092,370 (Jiang)—to render dependent claims 5 and 17 unpatentable as obvious. Telesign's petitions also included other grounds. Twilio does not challenge the Board's findings related to the Jiang reference or the other grounds on appeal.

decisions if they are “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706; *EmeraChem Holdings, LLC v. Volkswagen Grp. of Am., Inc.*, 859 F.3d 1341, 1345 (Fed. Cir. 2017).

### 1. The '376 Patent

The '376 patent relates to methods and systems that allow development of telephony applications using existing web development tools and resources. '376 patent at 1:61–2:6. Specifically, the '376 patent discloses a method of communicating with an application server by initiating a telephony session, mapping a call to a Universal Resource Identifier (URI), sending a request to the server associated with the URI, processing the request, and receiving a response from the server. *Id.* at 2:57–65. Claim 1 of the '376 patent is illustrative:<sup>2</sup>

#### 1. A method comprising:

operating a telephony network and internet connected system cooperatively with a plurality of application programming Interface (API) resources, wherein operating the system comprises:

initiating a telephony session,

communicating with an application server to receive an application response,

converting the application response into executable operations to process the telephony session,

creating at least one informational API resource; and

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<sup>2</sup> Twilio's challenges on appeal are limited to the limitations of claim 1. It does not separately challenge the Board's findings related to any of the dependent claims.

exposing the plurality of API resources through a representational state transfer (REST) API that comprises:

*receiving* a REST API request that specifies an API resource URI, and

*responding* to the API request according to the request and the specified resource URI.

(emphasis added). The Board held claims 1–3, 5, 14, 16, 17, and 19 of the '376 patent unpatentable as obvious in view of the combination of Maes and Ransom.<sup>3</sup> Twilio argues that the Board erred in its analysis of the *responding* limitation and in its construction of the term “API resource.” It further challenges the Board’s motivation-to-combine finding. As discussed below, we hold that the Board did not err in its analysis and substantial evidence supports its findings.

#### A. The *Responding* Limitation

The Board determined “that the combination of Maes and Ransom teaches responding to the REST API request according to the specified API resource URI.” J.A. 60. It found that Maes teaches that a “telephony gateway, TEL 20, responds to an API request that specifies an API resource, such as ‘MakeCall,’ ‘TransferCall,’ or ‘Record,’ by modifying the state of a telephony session according to the request and the specified resource, such as by initiating, transferring, or recording a call.” J.A. 59. The Board rejected Twilio’s argument that those portions of Maes do not teach responding to an API request according to a specified

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<sup>3</sup> As discussed above, the Board further relied on Jiang to support its holding that dependent claims 5 and 17 were obvious. Because Twilio only challenges the Board’s decisions as they relate to Maes and Ransom, we need not separately consider Jiang.

URI, finding that Maes teaches that the response may be to a single specified source. And the Board found that “Ransom teaches that an API request can be a REST API request that specifies an API resource URI.” J.A. 60.

The Board’s findings are based on substantial evidence. Maes teaches a system with an “audio I/O subsystem (or ‘TEL’)” which “comprises a gateway (e.g., telephony platform) that connects voice audio streams from a network to the various speech engines.” J.A. 5214–15 at 8:51–52, 9:5–7. It further teaches that the TEL component is “capable of receiving the HTTP/SOAP requests” and is capable of responding to those requests. J.A. 5227 at 34:7–35:8. Moreover, Maes teaches, for example, “[i]f play and/or record are part of the request, number of bytes played/recorded, number of overruns/underruns, completion reason, . . . play/record start/stop time . . . are included in the response.” J.A. 5228 at 35:25–28. Thus, Maes teaches responding to API requests according to the request and the specified source. Ransom teaches that REST and SOAP “are two common web service models wherein HTTP is the underlying application protocol” and in the REST model, “the service being invoked is the URI being accessed through the web.” J.A. 5282 at [0163]. Therefore, as the Board found, a person of ordinary skill in the art would understand that the HTTP/SOAP requests taught in Maes could instead be a REST API request with a specific URI, as taught in Ransom, resulting in the *responding* limitation.

Twilio argues the Board improperly modified the grounds raised in Telesign’s petition by combining Ransom with Maes to teach the *responding* limitation when Telesign’s petition never referenced Ransom’s teachings with respect to that claim limitation. While it is true that it would “not be proper for the Board to deviate from the grounds in the petition and raise its own obviousness theory,” such is not the case here. *Sirona Dental Sys. GmbH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir.

2018). Telesign argued in its petition that the combination of Maes and Ransom teaches the claim limitations, including both the *requesting* and *responding* limitations. Telesign specifically argued that Maes teaches a REST API request that specifies a resource URI, and teaches a response to that same request. J.A. 6361–64. It further argued that to the extent Maes does not teach a REST API request that specifies a URI, Ransom teaches that such a request was well known in the art. J.A. 6361–62. Accordingly, the Board found that Maes teaches responding to an API request and that Ransom teaches the API request can be a REST API request that specifies an API resource URI. J.A. 60. Telesign’s petition relies on Ransom to demonstrate that an API request can be a REST API request that specifies an API resource URI, which applies for both the *requesting* and *responding* limitations, and supports the Board’s findings related to the “responding” limitation. We hold therefore that the Board did not modify the grounds asserted in the petition, and substantial evidence supports the Board’s findings.

#### B. API Resource

We review the Board’s claim construction de novo except for necessary subsidiary factual findings based on extrinsic evidence, which we review for substantial evidence. *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 769 (Fed. Cir. 2018). The Board construed the term “application programming interface (API) resource” in the *operating* clause as “a resource available through an API.” J.A. 8.

Twilio argues the Board erred in its construction and obviousness analysis by not requiring that the API resource be identifiable by its URI. We do not agree. As an initial matter, the parties agreed that an API resource is a resource available through an API—the Board’s construction. Twilio, however, argued the construction should further include a requirement that the API resource be

identifiable by its URI, for purposes of the *operating* limitation. The Board rejected Twilio’s argument “[b]ecause claim 1 separately recites a URI that identifies an API resource” in the *receiving* limitation. J.A. 8. We agree with the Board’s construction. Under the broadest reasonable interpretation standard, which applies here, nothing in the claim or specification limits the API resource as it is used in the *operating* limitation.<sup>4</sup> The ’376 patent’s specification supports the Board’s rejection of Twilio’s argument because the specification contemplates a broad scope of API resources—“any suitable commands or methods may be used to interface with an API resource.” ’376 patent at 8:65–9:1. Accordingly, we find no error in the Board’s construction.

### C. Motivation to Combine

The Board found that a person of ordinary skill in the art would have been motivated to combine the teachings of Maes and Ransom. J.A. 66–71. Twilio argues that the Board’s finding that the references *could* be combined lacked any explanation for why a person of ordinary skill in the art *would* combine them. We do not agree. As the Board explained, “it would have been obvious under *KSR* to combine the cited teachings of Maes and Ransom because Ransom’s REST API is a common web service model that provides similar functionality and has several design advantages over Maes’ SOAP API, such as increased interface flexibility and lower bandwidth requirements.” J.A. 68. Documentary evidence and the declaration of Dr. Nielson, Telesign’s expert, supported the Board’s finding. *See* J.A. 5493–95, 5499–5500. Dr. Nielson explained that “[a] skilled artisan with a preference for REST would understand that using REST conventions instead of SOAP to

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<sup>4</sup> Indeed, Twilio points to the same language in claim 1 that the Board held would be deemed redundant to support its position that an API must be identifiable by its URI. Appellant’s Opening Br. at 38.

implement a web service API would be straight forward and with an almost certain chance of success.” J.A. 5493. He then explained that a person of skill in the art would be motivated to make such a modification because “REST has a flexible interface and requests and responses can be short, resulting in lower bandwidth consumption,” and “that it is lightweight, has human readable results, and is easy to build with no toolkits required.” J.A. 5494. Substantial evidence supports the Board’s motivation-to-combine finding.

## 2. The ’465 Patent

Like the ’376 patent, the ’465 patent generally relates to a method and system that allow development of telephony applications using existing web development tools and resources. ’465 patent at 1:61–2:3. The claims of the ’465 patent specifically relate to a method of processing a telephony communication involving mapping of a URI, which allows a telephony session to be converted into a format that may be handled with standard web servers and applications. Claim 1 of the ’465 patent is illustrative:<sup>5</sup>

1. A method for processing a telephony communication comprising:

associating an initial URI with a telephony endpoint;

initiating a telephony voice session for a telephony communication to the telephony endpoint;

*mapping* the initial URI to the telephony session;

*sending* an application layer protocol request to an application resource specified by the URI and

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<sup>5</sup> Twilio’s challenges on appeal are limited to the limitations of claim 1 of the ’465 patent.

embedding state information of the telephony voice session in the request;

receiving a response to the application layer protocol request sent to the application resource, wherein the response includes a document of telephony instructions; and

executing telephony actions during the telephony voice session according to a sequential processing of at least a subset of the telephony instructions of the response.

(emphasis added). The Board held claims 1–6, 9, and 13 of the '465 patent obvious in view of the combination of Maes and Ransom. Twilio argues that substantial evidence does not support the Board's findings that the *mapping* and *sending* limitations were taught by the combination of Maes and Ransom, or that a person of ordinary skill in the art would have been motivated to combine the references. Substantial evidence supports the Board's findings.

#### A. The *Mapping* Limitation

The Board found that “the combination of Maes and Ransom teaches sending a message that includes both the URI specifying the assigned application and information about the telephony session, thereby mapping the URI to the telephony session.” J.A. 13. Twilio argues that the Board did not address how Maes' message to an application maps the initial URI to the telephony session. We do not agree. Maes teaches assigning an application to take a call, and when the application is assigned, the TEL address is passed to the application for the duration of the call. J.A. 5218 at 15:58–62. Ransom teaches that the URI “defines the resource that is being accessed,” and that it was well known to send information over the Internet to an application using a URI. J.A. 5282 at [0162]–[0163]. The application, which may be defined by a URI, is mapped to the telephony session when it is assigned to take the call and

when the TEL address (the telephony gateway address containing information about the telephony session) is passed to the same application for the call's duration. In other words, the combination of Maes and Ransom teach "assigning an application specified by a URI to incoming call information (i.e., a telephony endpoint), thereby associating a URI with a telephony endpoint," which meets the *mapping* limitation. J.A. 17. Accordingly, we conclude that substantial evidence supports the Board's finding.

### B. The *Sending* Limitation

The Board found that Maes teaches "sending an application layer protocol request to an application resource specified by the URI and embedding state information of the telephony voice session in the request" as required by claim 1. J.A. 15. Twilio argues that substantial evidence does not support the Board's finding because Maes does not teach or suggest that the duration of the call is "embedd[ed] state information" as claimed.<sup>6</sup> Contrary to Twilio's position, Maes teaches passing the TEL address to the application for the duration of the call. J.A. 5218 at 15:58–62. The Board found that the TEL address, which is the telephony gateway address, is state information akin to the examples of state information referenced in the '465 patent—" [s]tate information included with each request may include a unique call identifier, call status data such as whether the call is in-progress or completed, the caller ID of the caller, the phone number called, geographic data about the callers, and/or any suitable data." J.A. 18; '465 patent at 5:33–

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<sup>6</sup> Twilio separately argues that even if the TEL address is state information, it was not "embedded" within the request. We hold that Twilio waived this argument by failing to raise it before the Board, and we will not consider it for the first time on appeal. See *HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1368 n.3 (Fed. Cir. 2017).

37. Because Maes teaches passing the TEL address to the application for the duration of the call, we conclude that substantial evidence supports the Board's finding that Maes teaches the *sending* limitation.

### C. Motivation to Combine

The Board found that a person of ordinary skill in the art would be motivated to combine Maes and Ransom to achieve the invention claimed in the '495 patent. J.A. 24–26. Twilio argues that the Board failed to sufficiently articulate a motivation to combine Maes with Ransom to achieve the *associating* and *mapping* limitations in claim 1. We conclude that substantial evidence supports the Board's motivation-to-combine finding. The Board found that a person of ordinary skill in the art would understand Ransom as explicit support of the understanding that it was well known *to use a URI* to send a message to an application over the Internet, as disclosed in Maes. J.A. 26. The Board was not relying on Ransom to *modify* the architecture disclosed in Maes, but instead to show that the combination expressly teaches using a URI to achieve the embodiment claimed in the '465 patent. As Dr. Nielson explained, a person of ordinary skill in the art would consider Ransom's express disclosure of use of URIs to better achieve Maes' goals of using Web APIs and Internet-based technologies. *See* J.A. 5417. Accordingly, substantial evidence supports the Board's finding that a person of ordinary skill in the art would be motivated to consider Maes and Ransom as a combination that expressly discloses the limitations of claim 1 of the '465 patent.

### CONCLUSION

We have considered the parties' remaining arguments and find them unpersuasive. Because the Board did not err in its analyses and substantial evidence supports the Board's findings, we affirm.

**AFFIRMED**