NOTE: This disposition is nonprecedential.

United States Court of Appeals
for the Federal Circuit

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HUAWEI TECHNOLOGIES CO., LTD.,
Appellant

v.

**ANDREI IANCU, UNDER SECRETARY OF
COMMERCE FOR INTELLECTUAL PROPERTY
AND DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE,**
Intervenor

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2019-1497

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Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2017-01483.

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Decided: June 4, 2020

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CONSTANTINE L. TRELA, JR., Sidley Austin LLP, Chicago, IL, for appellant. Also represented by NATHANIEL C. LOVE, JOHN WEATHERBY MCBRIDE; MICHAEL J. BETTINGER, CURT HOLBREICH, San Francisco, CA; RYAN C. MORRIS, Washington, DC.

MAUREEN DONOVAN QUELER, Office of the Solicitor,

United States Patent and Trademark Office, Alexandria, VA, for intervenor. Also represented by THOMAS W. KRAUSE, JOSEPH MATAL.

Before PROST, *Chief Judge*, REYNA and TARANTO, *Circuit Judges*.

TARANTO, *Circuit Judge*.

Huawei Technologies Co., Ltd. owns U.S. Patent No. 8,483,166, which describes and claims methods and apparatuses by which a mobile communication device can gain access to a 2G/3G network using a temporary identifier it already has from a 4G network. Samsung Electronics Co., Ltd., which is no longer a party to this case, successfully sought from the Patent and Trademark Office (PTO) an inter partes review of claims 1–5 and 12–16 of the '166 patent under 35 U.S.C. §§ 311–319. The Patent Trial and Appeal Board ultimately determined that claims 1–5 are unpatentable for obviousness and that claims 12–16 are not unpatentable. *Samsung Electronics Co. v. Huawei Technologies Co.*, No. IPR2017-01483, 2018 WL 6380662 (P.T.A.B. Dec. 4, 2018). On Huawei's appeal, we affirm.

I

A

The '166 patent, titled "Method and Apparatus for Accessing Legacy Networks Through Temporary ID of Evolved Network," describes how a mobile communication device—which the patent calls "a User Equipment (UE)"—that is set up to operate on an "evolved" network, such as a fourth-generation (4G) network, can gain access to a "legacy" network, such as a 2G or 3G network.

As background, the '166 patent describes the structure and functionality of a 3G network. A 3G network includes UEs; an access network, which communicates directly with the UEs; a core network, which provides

telecommunication services to the UEs; and an Iu interface, which connects the access and core networks. '166 patent, col. 1, lines 26–50. The access network includes several NodeBs—through which the UEs communicate with the network—along with NodeB-controlling devices referred to as Radio Network Controllers (RNCs) or, more generally, as Radio Access Network (RAN) nodes. *Id.*, col. 1, lines 44–46, 61–66. Each NodeB serves a geographic area, and the area served by a set of NodeBs and their corresponding controlling devices is known as a "pool area." *Id.*, col. 1, line 51, through col. 2, line 4. In a pool, all RAN nodes are connected to multiple Serving GPRS (General Packet Radio Service) Support Nodes (SGSNs), which are the elements of the core network responsible for maintaining a connection between the UEs and the core network. *See id.*, col. 1, lines 37–41; J.A. 2555.

As the '166 patent notes, when a UE first acquires access to a 3G pool, it is assigned to a particular SGSN so that when the UE moves within the pool area, it need not change which SGSN it communicates with. '166 patent, col. 2, lines 11–17. The assigned SGSN allocates to the UE a Packet Temporary Mobile Station Identity (P-TMSI), *id.*, col. 2, lines 11–21, which the UE takes as its user ID, *id.*, col. 4, lines 64–65. The P-TMSI is 32-bits long, and some of those bits are used for the Network Resource Identifier (NRI), which identifies the SGSN to which the UE is assigned. *Id.*, col. 5, lines 8–34. When the UE moves outside the initial pool area to a new pool area, the UE sends to a RAN node in the new pool a Routing Area Update request, which includes the P-TMSI and Routing Area Identity (RAI) corresponding to the old pool. *Id.*, col. 5, lines 44–52. When the RAN node cannot find the SGSN corresponding to the P-TMSI—because the corresponding NRI belongs to an SGSN in a different pool—it assigns the UE to a new SGSN in the new pool. *Id.*, col. 5, lines 52–60. The new SGSN uses the P-TMSI and RAI to locate the old SGSN and then sends the old SGSN a request for "context"

information regarding the UE. *Id.*, col. 5, line 61, through col. 6, line 2. After receiving the context information from the old SGSN, the new SGSN allocates a new P-TMSI and RAI to the UE. *Id.*, col. 6, lines 2–4. Retrieving context information in this way, rather than having the UE reregister with the new SGSN, enables use of the 3G network without interruption when the UE moves from pool to pool. *See id.*, col. 3, lines 32–34; J.A. 2554–55.

The '166 patent also describes, as background, analogous structures and functions from the then-developing 4G communication networks, such as a System Architecture Evolution (SAE) network. '166 patent, col. 2, lines 46–51. In the SAE network, Mobility Management Entities (MMEs)—like the SGSNs in the 3G network—are in communication with all RAN nodes within their pool and are responsible for creating temporary IDs for the UEs and storing UE context information. *See id.*, col. 2, lines 46–60; J.A. 2557–58. These temporary IDs are known as SAE-TMSIs or S-TMSIs. *See* '166 patent, col. 3, lines 21–26.

The '166 patent notes that legacy 2G/3G networks cannot parse the S-TMSI. In particular, when a UE operating on an SAE network travels into territory where it seeks to gain access to a 2G/3G network, the newly assigned SGSN from the 2G/3G network cannot identify the MME from which to request the UE's context information. '166 patent, col. 6, lines 5–9. To solve this problem, the '166 patent sets out a method by which a UE adds MME information from the evolved network to a P-TMSI sent in an access message to a RAN node in the legacy network. *Id.*, col. 3, lines 38–55.

Claims 1 and 2 of the '166 patent are representative for purposes of deciding the issues on appeal:

1. A method for accessing a 2G/3G network comprising:

obtaining, by a User Equipment (UE), a temporary identity (ID) allocated by a Mobility

Management Entity (MME) in an evolved network, wherein the temporary ID comprises MME information for identifying the MME;

adding, by the UE, the MME information from the temporary ID to a first P-Temporary Mobile Station Identity (P-TMSI) in an access message;

sending, by the UE, the access message to a Radio Access Network (RAN) node in the 2G/3G network.

2.   The method of claim 1, wherein the MME information comprises an MME-Identity (MME-id), and

wherein adding, by the UE, the MME information from the temporary ID to the first P-TMSI in the access message comprises:

setting, by the UE, the Network Resource Identifier (NRI) of the first P-TMSI in the access message as the MME-id.

'166 patent, col. 17, lines 46–64.

B

In May 2017, Samsung petitioned for an inter partes review of claims 1–5 and 12–16 of the '166 patent. Samsung argued that the claims are unpatentable on four grounds, two of which are relevant to this appeal: *first*, claims 1–3, 5, 12–14, and 16 are unpatentable for obviousness over a combination of TS 23.236, a technical specification published by the 3rd Generation Partnership Project (3GPP), and S2-073255, a 3GPP discussion document; and *second*, claims 4 and 15 are unpatentable for obviousness over TS 23.236 and S2-073255 in further view of TR 23.882, a 3GPP technical report.

Initially, the Board instituted a review of only claims 1–5. After the Supreme Court's decision in *SAS Institute*

Inc. v. Iancu, 138 S. Ct. 1348 (2018), the Board added claims 12–16 to the proceedings. In its final written decision, the Board determined that claims 1–3 and 5 are unpatentable for obviousness over a combination of TS 23.236 and S2-073255 and that claim 4 is unpatentable for obviousness over a combination of TS 23.236, S2-073255, and TR 23.882. *Samsung*, 2018 WL 6380662, at *24. After adopting a broad claim construction of "MME information for identifying the MME" in claim 1, *id.* at *5–7, the Board determined that, even under Huawei's narrower construction, claim 1 is unpatentable for the same reason (as relevant here) that claims 2–5 are unpatentable: a relevant artisan would have found it obvious to incorporate the "MME-id" (of claim 2) disclosed in S2-073255 into the NRI field taught by TS 23.236, *id.* at *16–22. The Board rejected Samsung's challenge to claims 12–16. *Id.* at *22–24.

Huawei timely appealed, and when Samsung withdrew from the appeal, the Director of the PTO intervened, pursuant to 35 U.S.C. § 143, to defend the Board's decision. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II

On appeal, Huawei challenges the Board's construction of claim 1's limitation "MME information for identifying the MME." It also challenges the Board's determination that the prior art renders claims 1–5 unpatentable for obviousness even under Huawei's claim construction of the claim 1 limitation. In the latter challenge, Huawei argues that the Board erroneously determined that the prior art does not teach away from the relied-on combination and erroneously relied on reasoning not supported by the references or included in Samsung's petition.

We conclude that the Board did not err in determining that a relevant artisan would have found it obvious to incorporate the MME-id disclosed in S2-073255 into the NRI field taught by TS 23.236. Upholding the Board's determination as to that combination suffices to affirm the Board's

unpatentability determination as to claims 1–5, without reaching Huawei's claim construction challenge.

We review the Board's determination of obviousness de novo and its underlying factual findings for substantial-evidence support. *Personal Web Technologies, LLC v. Apple, Inc.*, 848 F.3d 987, 991 (Fed. Cir. 2017). Among the factual determinations in an obviousness analysis are "findings as to the scope and content of the prior art," *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1364 (Fed. Cir. 2015), and "[w]hether a reference teaches away," *In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016). "Substantial evidence review asks 'whether a reasonable fact finder could have arrived at the agency's decision' and requires examination of the 'record as a whole, taking into account evidence that both justifies and detracts from an agency's decision.'" *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1366 (Fed. Cir. 2016) (quoting *In re Gartside*, 203 F.3d 1305, 1312 (Fed. Cir. 2000)). We review the Board's procedural decisions for an abuse of discretion. *Ericsson Inc. v. Intellectual Ventures I LLC*, 901 F.3d 1374, 1379 (Fed. Cir. 2018).

A reference "teach[es] away" when a relevantly skilled artisan, upon reading the reference, "would be discouraged from following" a path disclosed by the reference, or "would be led in a direction divergent" from the disclosed path. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009). A reference does not teach away "if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed." *Id.* (citation and quotation marks omitted).

A

Huawei focuses entirely on claim 2 in challenging the Board's unpatentability determination as to claims 2–5.

We reject Huawei's arguments for disturbing the Board's obviousness ruling as to those claims.

Claim 2 recites:

The method of claim 1, wherein the MME information comprises an MME-Identity (MME-id), and

wherein adding, by the UE, the MME information from the temporary ID to the first P-TMSI in the access message comprises:

setting, by the UE, the Network Resource Identifier (NRI) of the first P-TMSI in the access message as the MME-id.

'166 patent, col. 17, lines 57–64.

The Board found that S2-073255, which is a 3GPP discussion document, teaches that "the MME information comprises an MME-Identity (MME-id)." *Samsung*, 2018 WL 6380662, at *19 (citing J.A. 2105 ("[T]he S-TMSI identifies both the user and the serving MME. . . . The MME id in the S-TMSI is unique to ensure that the S-TMSI remains unique.")). And the Board found that TS 23.236, which is a 3GPP technical specification, discloses the intra-domain connection between RAN nodes and SGSN in 2G/3G networks and the processes by which the SGSNs exchange context information when a UE moves from one pool to another. *See id.* at *14. In essence, TS 23.236 discloses the structure and functionality of 2G/3G networks that the '166 patent describes as prior art, discussed above. *Compare* J.A. 1856 *with* '166 patent, Fig. 1. Although neither TS 23.236 nor S2-073255 alone teaches setting the NRI of the P-TMSI as the MME-id, the Board found that the references in combination conveyed that teaching to a relevant artisan. *Samsung*, 2018 WL 6380662, at *18–19.

Huawei argues that S2-073255 actually teaches away from incorporating its MME-id into TS 23.236's NRI field. Huawei points to TS 23.236's disclosure of an NRI field at

most ten bits long. J.A. 1864. Although S2-073255 discloses a seven-bit MME-id (which could fit within TS 23.236's ten-bit NRI field), that disclosure, Huawei stresses, is part of an illustration of the need to expand the S-TMSI. *See* J.A. 2103. In describing two potential modifications to the S-TMSI, S2-073255 proposes expanding the length of the MME-id to 14 or 24 bits. J.A. 2104. Therefore, Huawei contends, a relevant artisan would have been discouraged from using an MME-id of ten bits or fewer and, accordingly, would not have considered setting the NRI field to the MME-id when a UE sends an access message.

The Board rejected this argument, and we conclude that substantial evidence supports the Board's finding that S2-073255 does not teach away from the combination on which the Board relied. As the Board found, S2-073255 explicitly discloses a seven-bit MME-id. *Samsung*, 2018 WL 6380662, at *20. Although the reference discloses modifications of S-TMSI that have longer MME-ids, the Board found that it does not disclose that the MME-id itself must be expanded. *Id.* Rather, S2-073255 says only that the *S-TMSI* should be expanded. J.A. 2103 ("[T]he length of S-TMSI definitely should be expanded."). Moreover, the Board found, even if a relevant artisan would have understood that the MME-id itself should be expanded, the reference does not discourage expansions (beyond seven) to ten bits or fewer. *Samsung*, 2018 WL 6380662, at *21. Additionally, Huawei's expert testified that "neither the format nor the location of the MME-id were defined" prior to the critical date of the '166 patent. Ex. 2002 at ¶ 122, *Samsung*, No. IPR2017-01483, 2018 WL 6380662. Given the unsettled nature of the MME-id, the Board could reasonably conclude that two proposals using an MME-id of 14 or 24 bits would not have dissuaded a relevant artisan from using a shorter MME-id, which could fit within the ten-bit NRI field.

Huawei further argues that the Board, in finding no teaching away, impermissibly relied on modifications of the

prior art that were not suggested in any of Samsung's papers and not supported by the record. In the relevant portion of its analysis, the Board reasoned that there were several ways to expand the S-TMSI to increase the network's user capacity—as S2-073255 sought to do—without necessarily expanding the MME-id beyond ten bits. *Samsung*, 2018 WL 6380662, at *20. This discussion is just one among several independent justifications, discussed above, for the Board's finding that the cited references do not teach away. Even without this particular support, there is substantial-evidence support for the Board's conclusion. Therefore, we need not determine whether the particular part of the Board's reasoning on which Huawei now focuses was improper.

Finally, Huawei argues that even if S2-073255 teaches an MME-id with ten or fewer bits, the record does not support the Board's finding that it would have been obvious to place that MME-id into the NRI of an access message. But Samsung's expert Dr. Williams testified that "it was widely recognized at the time of the invention that the MME-id used in LTE [long term evolution] networks was analogous to the NRI used in 2G and 3G networks"; consequently, "[i]t also would have been the most logical solution because the new RAN node and new SGSN were already configured to look at the NRI bits of the P-TMSI to derive the old SGSN." J.A. 2597. The Board credited this testimony, relying on the same references as Dr. Williams to show that a relevant artisan would have understood that the MME-id and NRI were "equivalen[t]." *Samsung*, 2018 WL 6380662, at *18 (citing J.A. 2018; J.A. 2637). Huawei has not persuaded us that the Board's interpretation of those references is unreasonable.

B

The Board construed "MME information for identifying the MME" to mean "any information that can be used to identify the MME in an evolved network." *Samsung*,

2018 WL 6380662, at *7. Huawei argues that the "MME information" must include at least the *entire* MME-id. But even under Huawei's construction, the Board determined that it would have been obvious to a relevant artisan to incorporate the entirety of S2-073255's MME-id into the P-TMSI—in particular, the NRI portion of the P-TMSI—taught by TS 23.236. *Id.* at *18. As discussed above, we agree with that determination. Therefore, we need not decide the appropriate claim construction to affirm the determination that claim 1 is unpatentable.

III

For the foregoing reasons, we affirm the Board's final written decision.[1]

AFFIRMED

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[1]   On November 7, 2019, Huawei filed a letter with the court asking us to vacate the Board's decision and remand for consideration by a different Board panel under this court's decision regarding the Appointments Clause in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320 (Fed. Cir. 2019). We reject this request. Huawei did not raise this issue before filing its opening brief or in that brief. We see no sound basis for distinguishing this case from our precedent deeming the challenge forfeited in such circumstances. *See Customedia Technologies, LLC v. Dish Network Corp.*, 941 F.3d 1173, 1174 (Fed. Cir. 2019).