United States Court of Appeals for the Federal Circuit

IPCOM GMBH & CO.,
Appellant

v.

HTC CORPORATION,
Appellee

2016-1474

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. 95/001,192.

Decided: July 7, 2017

MITCHELL G. STOCKWELL, Kilpatrick Townsend & Stockton LLP, Atlanta, GA, argued for appellant. Also represented by MICHAEL S. PAVENTO, DAVID A. REED.

MICHAEL A. OBLON, Perkins Coie, LLP, Washington, DC, argued for appellee. Also represented by TYLER R. BOWEN, JONATHAN M. JAMES, Phoenix, AZ; DAN L. BAGATELL, Hanover, NH.

Before PROST, *Chief Judge,* CLEVENGER and CHEN, *Circuit Judges.*

CHEN, *Circuit Judge*.

IPCom GmbH & Co. (IPCom) is the owner of U.S. Patent No. 6,879,830 ('830 patent), which describes and claims a method and system for handing over a mobile phone call from one base station to another base station. After IPCom sued HTC Corporation (HTC) for infringing the '830 patent, HTC requested that the U.S. Patent and Trademark Office (PTO) conduct inter partes reexamination of claims 1, 5–26, and 28–37 of the '830 patent, which the PTO granted. The reexamination went through two rounds of review by the Examiner and the Patent Trial and Appeal Board (Board). In the first round, the Examiner concluded that the claims were patentable, but HTC appealed to the Board, which issued a new ground of rejection for claims 1 and 5–30. In the second round, IPCom amended claims 1, 5–26, and 28–37,[1] but the Board found that these amended claims were obvious under 35 U.S.C. § 103 in view of various combinations of McDonald,[2] Anderson,[3] GSM,[4] and PACS.[5]

In its appeal, IPCom alleges that, even though it had amended the scope of claims 31–37 during its second round before the Examiner, the Board lacked jurisdiction to review the Examiner's patentability determination of these amended claims in the Board decision now on

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[1] IPCom cancelled claim 27. J.A. 3.

[2] U.S. Patent No. 5,222,248.

[3] U.S. Patent No. 6,088,590.

[4] Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification (GSM 04.08 version 6.1.1 Release 1997). J.A. 13225; *see infra* Background Part III.

[5] American National Standard for Telecommunications-Personal Access Communications System Air Interface Standard (approved November 16, 1998). J.A. 13823; *see infra* Background Part IV.

appeal. IPCom also argues that the Board's obviousness rejections were based on a flawed claim construction, because the Board never identified the structure in the patent specification that corresponds to the "arrangement for reactivating the link" means-plus-function claim limitation. IPCom also appeals the Board's factual findings for several other claim limitations and the motivation to combine the prior art references in the manner claimed by the '830 patent.

We conclude that, under the circumstances of this case, the Board properly had the authority to consider the patentability of claims 31–37 and thus reject IPCom's procedural challenge to the Board's rejection of these claims. But we agree with IPCom that the Board failed to conduct a proper claim construction of the "arrangement for reactivating the link" claim limitation, and we vacate and remand the obviousness rejections based on that limitation. We affirm the Board's findings in all other respects.

BACKGROUND

The '830 patent describes a method for performing handover (or handoff) of a cellular telephone or mobile station (MS) in a cellular telephone network from a first base station (BS1) to a second base station (BS2). '830 patent col. 1 ll. 14–62. Mobile stations communicate with a network by exchanging signals with a base station, where the base station is part of a wired network of base stations, fixed lines, and switching units. *Id.* col. 2 l. 64–col. 3 l. 3. Handover occurs in a network when the mobile station switches from one base station to another. *Id.* col. 1 ll. 25–28.

The '830 patent describes forward and forced handover techniques. *Id.* col. 5 ll. 10–15, 61–64. A forward handover is one in which the mobile station, rather than the first base station, determines a handover is necessary, and seeks out the second base station. *Id.* col. 1 ll. 37–38.

A forced handover is one in which the first base station initiates the handover, e.g., by sending a message to the mobile station instructing the mobile station to perform a handover to a second base station. *Id.* col. 1 ll. 53–56, col. 2 ll. 24–31.

To reduce the chance of interrupted service when a mobile station must perform a handover, the claimed invention calls for the first base station to maintain, for a period of time, the link data for the mobile station as well as hold in reserve link resources required to maintain a link between the mobile station and the first base station. When a handover of the mobile station to a second base station is unsuccessful, the mobile station reactivates the link with the first base station, e.g., by continuing to maintain the link. *Id.* col. 2 ll. 38–40, col. 5 ll. 10–15, 61–64, col. 6 ll. 13–53. By providing this feature, if the mobile station cannot establish a link with a second base station, the mobile station's link with the first base station can be maintained without the mobile base station having to resend link information to the first base station. *Id.* col. 5 ll. 24–26, col. 6 ll. 40–52. This feature is claimed in the "arrangement for reactivating the link" limitation in independent claims 1, 18, 30, and 34. J.A. 12565–74. Claim 1 is reproduced below:

> 1. (Unamended) A mobile station for use with a network including a first base station and a second base station that achieves a handover from the first base station to the second base station by:
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> storing link data for a link in a first base station,
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> holding in reserve for the link resources of the first base station, and
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> when the link is to be handed over to the second base station:

> initially maintaining a storage of the link data in the first base station,
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> initially causing the resources of the first base station to remain held in reserve, and
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> at a later timepoint determined by a fixed period of time predefined at a beginning of the handover, deleting the link data from the first base station and freeing up the resources of the first base station, the mobile station comprising:
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> *an arrangement for reactivating the link with the first base station* if the handover is unsuccessful.

J.A. 12565 (emphasis added). Independent claims 18, 30, and 34 also recite three additional limitations of (1) a "forced handover request message" from the first base station to the mobile station; (2) a "handover query" from the mobile station to a second base station; and (3) a "rejection message" from the second base station if the second base station cannot support the mobile station. Appellant Br. 10–11; J.A. 12570–74.

The '830 patent also describes a flexible type of handover, in which a handover is handled in different ways, depending on whether a network can support handover by transferring "link data" directly between the first and second base stations, or whether that information must be communicated directly from the mobile station to the second base station. '830 patent col. 2 ll. 32–38, col. 3 ll. 10–16. This feature is the "informing the mobile station" limitation recited in independent claims 5, 12, and 16. J.A. 12566–70. Claim 5, for example, recites "informing the mobile station whether the network is capable of transferring the link data from the first base station to the second base station." J.A. 12567. The last relevant limitation in the challenged claims covers a network using

different generations of radio communication standards and is recited in claims 23 and 25. J.A. 12571–72. These claims recite that "the first base station and the second base station operate in respective parts of the network using different generations of radiocommunications standards for radio communication with the mobile station." J.A. 12571–72.

For purposes of this appeal, the challenged claims can be separated into five categories. First, independent claims 1, 18, 30, and 34 recite the "arrangement for reactivating the link" means-plus-function limitation. Second, independent claims 18, 30, and 34 recite the "forced handover request message," "handover query," and "rejection message" limitations. Third, independent claims 5, 12, and 16 recite the "informing the mobile station" limitation. Fourth, dependent claims 23 and 25 recite using different generations of radio communications standards. Fifth, claims 31–37 are challenged based on jurisdiction.

I. McDonald

As noted, the Board considered four prior art references. McDonald describes a technique for dealing with failed handovers. When a mobile station moves from one cell to a neighboring cell in a cellular telephone network, the mobile station searches for a second base station in the neighboring cell and sends an inbound signaling word (ISW) message to inquire whether a handover is possible. McDonald col. 1 ll. 30–33, col. 2 l. 66–col. 3 l. 9. If the second base station cannot support a handover, the network sends the mobile station a busy outbound signaling word (OSW) rejection message. *Id.* col. 1 ll. 42–46, col. 2 ll. 1–3). The "busy OSW" signal informs the mobile station that the network cannot transfer link data from the first base station to the second base station. J.A. 7. The mobile station "can then choose to return" to the first base station by "deregister[ing]" from the second base

station, "inform[ing]" the network that it is "returning to the previous channel," and "attempt[ing] to receive" at the first base station. McDonald col. 3 ll. 14–21.

II. Anderson

Anderson describes "mobile directed" or "mobile centric" handover techniques. Anderson col. 17 ll. 45–52. Anderson describes integrating multiple cellular network technologies, including GSM (prior art reference described *infra* at Background Part III) into a single network. *Id.* col. 4 ll. 40–61. It also describes several types of successful handovers, including a "make before break" handover. *Id.* col. 15 l. 25–col. 18 l. 25. In this handover, the mobile station initiates a handover attempt based on a drop in link quality below a predetermined threshold level between the mobile station and a first base station. *Id.* col. 16 ll. 26–33. To initiate the handover, the mobile station scans for potential new base stations and measures the received signal quality from the potential new base stations to identify a base station with the highest signal quality (the second base station). *Id.* col. 16 ll. 6–30. The mobile station then sends a handover request message to the second base station and waits for a response. *Id.* col. 16 ll. 26–33. If the second base station accepts the mobile station's handover request, the second base station sends a response requesting transfer of the link data from the first base station to the second base station, and the network transfers the link data. *Id.* col. 16 ll. 36–60. By transferring the link data from the first base station to the second base station, the network informs the mobile station that the network can transfer the link data.

Anderson also describes a "break before make" embodiment to prevent interrupted service. Anderson col. 18 ll. 16–21. In this embodiment, a mobile station that suddenly loses its connection with a first base station can quickly reacquire the first base station, or acquire a different base station (even if no information is available

after the link with the first base station is lost). *Id.* col. 18 ll. 16–21.

III. Global System for Mobile (GSM) Communications

The Global System for Mobile (GSM) communications standard was developed by the European Telecommunications Standards Institute (ETSI) to standardize telecommunications protocols. J.A. 13225. GSM describes reactivating a link with a first base station when a handover attempt to a second base station is unsuccessful. The mobile station sends a "channel request" message to a second base station, which responds, in some circumstances, with an "immediate assignment reject" message. J.A. 13303. The mobile station then sends a "handover failure" message to the first base station and "resumes normal operation as if no handover attempt had occurred." *Id.* GSM also describes the use of base stations that can operate using different generations of radio communications standards because it discloses a mobile station that can communicate with both "upgraded GPRS [General Packet Radio Service] or 2.5G base stations" and "pre-existing GSM or 2G-only base stations." J.A. 19–20.

IV. Personal Access Communications System Air Interface Standard (PACS)

The American National Standards Institute (ANSI) adopted and promoted wireless telecommunications standards such as the Personal Access Communications System Air Interface Standard (PACS) in 1998. J.A. 13823, 14842. PACS describes a communications system using an Automatic Link Transfer (ALT) handover procedure to transfer a mobile station from one base station to another base station. J.A. 13969–71. When a first base station deems that a handover attempt to a different base station is necessary, the first base station sends a PERFORM_ALT message to the mobile station to force the mobile station to attempt a handover. J.A. 13969. The mobile station then issues a handover

query by sending an ALT_REQ message to a second base station. J.A. 13987–88. If the network cannot perform the requested transfer, the network responds with an ALT_DENY message, and the mobile station "resume[s] the conversation on the old link." J.A. 13976–77. Thus, PACS discloses, among other things, (i) a forced handover request message (PERFORM_ALT), (ii) a handover query message (ALT_REQ), and (iii) a rejection message (ALT_DENY). J.A. 11, 13. It also discloses interfacing with other networks, such as GSM. J.A. 13885.

We have jurisdiction under 28 U.S.C. § 1295(a)(4).

DISCUSSION

I. Standard of Review

In construing claims, the Board applies the broadest reasonable interpretation consistent with the specification. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016). "We review intrinsic evidence and the ultimate construction of the claim de novo." *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1316 (Fed. Cir. 2015). "We review the Board's conclusions of law de novo and its findings of fact for substantial evidence." *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1337 (Fed. Cir. 2016). Substantial evidence "means such relevant evidence as a reasonable mind might accept as adequate." *Id.* (quoting *Consol. Edison Co. of N.Y. v. NLRB*, 305 U.S. 197, 229 (1938)).

II. Claim Construction

We begin with claim construction. Following our opinion in *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270 (Fed. Cir. 2012), the claim limitation "an arrangement for reactivating the link with the first base station" in the '830 patent is a means-plus-function limi-

tation. [6] While the Board recognized that ruling, it failed to properly construe that limitation. The Board rejected IPCom's proposed three-step algorithm allegedly disclosed in the '830 specification for performing the "arrangement for reactivating the link" function, but the Board failed to identify what it believed to be the correct algorithm from the specification; that omission led to an incomplete construction of the claim limitation and is incompatible with our holding in *In re Donaldson Co.*, 16 F.3d 1189, 1193 (Fed. Cir. 1994) (en banc).

In *Donaldson*, the PTO rejected Donaldson's claims by construing a means-plus-function limitation to encompass any means capable of performing the recited function, giving no consideration to the content in the specification. *Id.* The PTO argued that such a practice was permissible under the broadest reasonable interpretation standard used by the agency. *Id.* at 1194–95. We rejected the PTO's view, holding that the agency must follow the plain language of §112 ¶ 6.[7] *Id.* at 1193. We explained that the construction of a means-plus-function limitation under § 112 ¶ 6 "must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such

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[6] In related district court litigation, IPCom asserted infringement of the '830 patent against HTC, and the district court case has been stayed pending completion of the inter partes reexamination.

[7] Because the '830 patent was filed before the effective date of revisions to 35 U.S.C. § 112 made by The Leahy-Smith America Invents Act, Pub. L. No. 112-29, §§ 4(c) & 4(e), 125 Stat. 284, 296–97 (2011), the prior version of § 112 controls, *see MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1168 n.3 (Fed. Cir. 2015) (applying the pre-AIA version of 35 U.S.C. § 112 ¶ 6).

disclosure." *Id.* We "h[e]ld that paragraph six applies regardless of the context in which the interpretation of means-plus-function language arises, i.e., whether as part of a patentability determination in the PTO or as part of a validity or infringement determination in a court." *Id.* In other words, § 112 ¶ 6 "sets a limit on how broadly the PTO may construe means-plus-function language under the rubric of 'reasonable interpretation,'" and "the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination."[8] *Id.* at 1194–95.

In *HTC Corp.*, we explained that HTC and IPCom agreed that the "arrangement for reactivating the link" recited in the '830 patent was a means-plus-function limitation. 667 F.3d at 1278. Section 112 ¶ 6 thus required the Board to perform a two-step analysis. *Id.* First, the Board had to "identif[y] the particular claimed function." *Id.* Second, the Board had to "look[] to the specification and identif[y] the corresponding structure, material, or acts that perform that function." *Id.* In *HTC Corp.*, the district court "concluded that the structure corresponding to the 'arrangement for reactivating [the link]' limitation was 'a processor connected to a transceiver and programmed to formulate and send messages to reactivate the link, if the handover is unsuccessful.'" *Id.* We held that the district court misstated the law when it "stated that disclosure of a processor and transceiver

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[8] We also explained that "if one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language," because "[i]f an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112." *Donaldson*, 16 F.3d at 1195.

alone was sufficient to provide structure to these claims" because "[t]he processor and transceiver amount[ed] to nothing more than a general-purpose computer." *Id.* at 1280. We explained that "[r]ather than relying on the processor and transceiver, IPCom had to identify an algorithm that the processor and transceiver execute." *Id.* We noted that although IPCom argued that the '830 patent contains such an algorithm, the district court never addressed that question "because HTC never asked it to do so." *Id.* "HTC had an opportunity to argue the algorithm issue—at IPCom's invitation—during briefing on claim construction and HTC's summary judgment motion, and at oral argument before the district court," yet HTC did not do so. *Id.* at 1282. We held that "[b]ecause HTC never attacked the adequacy of the algorithm in the '830 patent when given an opportunity to do so before the district court," HTC waived any opportunity to raise it on appeal as a basis for invalidating the claims. *Id.* at 1283.

Here, the issue of identifying in the '830 patent the algorithm for performing the "arrangement for reactivating the link" function was front and center during the reexamination. The Board rejected IPCom's proposed three-step algorithm of: (1) "receiving a rejection from the second (i.e., target) base station"; (2) "sending a message to the first (i.e., old) base station to maintain the link with the first base station"; and (3) "re-establishing the link with the first base station by receiving a message from that first base station." J.A. 15. Rather than inquiring further into what algorithm (if any) the specification actually discloses, however, the Board only questioned whether each individual step of IPCom's proposed algorithm was separately necessary. For step one, the Board found that the specification described an example of an "algorithm structure" that "does *not* involve receiving a rejection from the second base station" because "in some cases . . . no other base station is receiving." J.A. 16. For

step two, the Board cited the specification's discussion of a timer mechanism that purportedly obviated the need for a message to be sent to the first base station to reactivate the link with the first base station. *Id.* For step three, the Board pointed to the specification's explanation that the mobile station "re-registers at its old [base station] and keeps its previous settings," purportedly without requiring a receipt of an acknowledgement message from the first base station. J.A. 17. The Board then concluded its analysis by stating that it "need not consider whether or not the combination of Anderson and McDonald discloses or suggests these method steps." J.A. 18.

The Board's analysis was erroneous because it never specified what it believed was the actual algorithm disclosed in the '830 patent for performing the "arrangement for reactivating the link" function. It was not enough for the Board to reject the individual steps of IPCom's proposed three-step algorithm. As we explained in *Donaldson*, "the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination." *Donaldson*, 16 F.3d at 1195. And in *HTC Corp.*, we held that "the functional claiming in claims 1 and 18 of the '830 patent must include an adequate algorithm." *HTC Corp.*, 667 F.3d at 1283. Here, as in *Donaldson*, the Board never engaged in a comparison of the asserted prior art's disclosure to the "structure" disclosed in the '830 patent, due to the Board's failure to determine what the '830 patent describes as the structure (i.e., the algorithm in combination with the processor and transceiver) for performing the "arrangement for reactivating the link" function. Like *Donaldson*, the Board here impermissibly treated the means-plus-function limitation in its patentability analysis as if it were a purely functional limitation.

We vacate the Board's claim construction of the "arrangement for reactivating the link" limitation, and we remand for the Board to identify the corresponding algo-

rithm (if any) in the specification in the first instance, consistent with our holdings in *Donaldson* and *HTC Corp.* Because it never identified any algorithm for the "arrangement for reactivating the link" limitation, the Board also erred by failing to evaluate whether the prior art disclosed that algorithm (or its equivalents). J.A. 15–18. We therefore vacate and remand the Board's finding of obviousness of claims 1, 18, 30, and 34, and their corresponding dependent claims.

III. Obviousness

We also address here the Board's findings on the other claim limitations—the "forced handover request message," "handover query," and "rejection message"—which are each recited in claims 18, 30, and 34. J.A. 9–13. We then discuss the Board's rejections of claims 5–17 based on the "informing the mobile station" limitation, and the Board's rejections of claims 23 and 25 based on the limitation reciting different generations of radio communication standards, before addressing the motivation to combine McDonald, Anderson, GSM, and PACS to arrive at the claimed inventions.

A.

We first address IPCom's procedural argument that the Board could not rely on GSM and PACS as prior art references because HTC did not explain why those references could not have been presented earlier in the proceeding. **[JA5]** After the Board's decision in the first round of review finding the challenged claims of the '830 patent unpatentable, IPCom reopened prosecution under 37 C.F.R. § 41.77(b) and amended its claims in the second round of review. Under 37 C.F.R. § 41.77(c), HTC filed comments on IPCom's response and claim amendments, raising the GSM and PACS references along with the previously relied upon Anderson and McDonald references. J.A. 2–5. IPCom argued to the Board that HTC did not explain why the additional prior art could not

have been raised previously in the proceeding, but the Board explained that § 41.77(c) does not require HTC to "explain why the additional prior art could not have been presented earlier," when HTC's comments were filed in response to IPCom's request to reopen prosecution. J.A. 6.

We apply "the standards set forth in the Administrative Procedure Act, 5 U.S.C. § 706" in reviewing the Board's interpretation of PTO regulations. *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1306 (Fed. Cir. 2015). "[W]e set aside actions of the Board that are arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Id.* "We accept the Board's interpretation of [PTO] regulations unless that interpretation is 'plainly erroneous or inconsistent with the regulation.'" *Id.* (quoting *In re Sullivan*, 362 F.3d 1324, 1326 (Fed. Cir. 2004)).

We agree with the Board, which properly applied its regulations to consider GSM and PACS because they were cited in response to IPCom's election to reopen prosecution and amend the challenged claims. J.A. 12564–74. The Board correctly explained that § 41.77(c) does not require HTC to "explain why the additional prior art could not have been presented earlier." J.A. 6. Section 41.77(c) requires only that HTC's comments be limited to the Board's decision and issues raised by IPCom's request to reopen prosecution.[9] 37 C.F.R. § 41.77(c). When it

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[9] Similarly, contrary to IPCOM's position, § 1.948(a) uses the disjunctive "or," which makes it unnecessary for HTC to explain why the additional prior art could not have been raised previously. 37 C.F.R. § 1.948(a)(2). Section 1.948(a) provides that a third party requester may only cite additional prior art:

reopened prosecution, IPCom amended claims 5, 12, 16, 18, 23, 25, 30, and 34 (and their dependent claims) to include the "forced handover request message," the "handover query," the "rejection message," the "informing the mobile station" limitation, and different generations of radio communications standards.[10] J.A. 12564–74. We affirm the Board's finding that it could properly consider

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> (1) which is necessary to rebut a finding of fact by the examiner;
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> (2) *which is necessary to rebut a response of the patent owner; or*
>
> (3) which for the first time became known or available to the third party requester after the filing of the request for inter partes reexamination proceeding. Prior art submitted under paragraph (a)(3) of this section must be accompanied by a statement as to when the prior art first became known or available to the third party requester and must include a discussion of the pertinency of each reference to the patentability of at least one claim.

37 C.F.R. § 1.948 (emphasis added). Thus, § 1.948(a) allows HTC to cite additional prior art if that prior art "is necessary to rebut a response of the patent owner." *Id.*

[10] Although the "arrangement for reactivating the link" limitation was not an amendment to the challenged claims, IPCom sought a new construction of this limitation based on "new evidence in th[e] reexamination; it was not available when [IPCom] filed its [earlier] responses." J.A. 12473–75, 12582. HTC properly responded to IPCom's new argument on the "arrangement for reactivating the link" limitation. On remand, the Board should identify the correct algorithm for this limitation and determine whether the prior art discloses that algorithm.

GSM and PACS against IPCom's request to reopen prosecution and amend the claims.[11]

B.

We now turn to whether the prior art discloses the claim limitations in dispute other than the "arrangement for reactivating the link" limitation. The Board agreed with HTC that PACS discloses a "forced handover request message" by describing a PERFORM_ALT message that is transmitted from the network to a mobile station. J.A. 11. It also agreed that PACS discloses a "handover query" by describing an ALT_REQ message and a "rejection message" by describing an ALT_DENY message. J.A. 13.

We agree with the Board. We note that IPCom concedes that PACS discloses that the PERFORM_ALT message is forced, i.e., mandatory, but IPCom argues that PACS never teaches the possibility of reactivating the link if the handover is unsuccessful, which, in IPCom's view, is part of the "forced handover request message" limitation. Appellant Br. 54; Reply Br. 24. IPCom is incorrect; the Board correctly explained that reactivating the link and the forced handover request message are separate claim limitations. J.A. 11. It also noted that IPCom did not challenge HTC's argument that PACS discloses the "handover query" and "rejection message,"

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[11] IPCom argues that it had no opportunity to submit rebuttal evidence with respect to GSM and PACS. Reply Br. 21–23. The Board explained to IPCom in its second round decision, however, that the rejections based on GSM and PACS were new grounds of rejection that would allow IPCom to reopen prosecution. J.A. 20–21. IPCom had the opportunity to reopen prosecution just as IPCom did after the first round before the Board in which the Board adopted new grounds of rejection, but IPCom chose not to do so.

id. at 13, and IPCom does not challenge these findings on appeal. Appellant Br. 42–44; Reply Br. 13–16, 24. Thus, we affirm the Board's findings that PACS discloses the "forced handover request message," the "handover query," and the "rejection message" limitations.

C.

Next, we turn to claims 5–17 and find no error in the Board's analysis of the "informing the mobile station" limitation. The Board explained that claim 5, as amended, recites "informing the mobile station whether the network is capable of transferring the link data from the first base station to the second base station." J.A. 6. IPCom argued independent claims 5, 12, and 16 and their dependent claims to the Board as a group, and the Board treated claim 5 as representative. *Id.* The Board found that McDonald's "busy OSW" signal informs the mobile station that the network cannot transfer the link data from the first base station to the second base station. J.A. 7. It also found that Anderson disclosed a successful handover, which informs the requesting mobile station that the network could perform the transfer. *Id.* The Board found that combining Anderson and McDonald would have disclosed informing the mobile station whether a network was capable of handover because it would achieve both alternatives: successful and unsuccessful handover messages. J.A. 7–8.

We agree that substantial evidence supports the Board's finding that the combination of Anderson and McDonald teaches the recited "informing the mobile station" limitation because Anderson teaches a successful handover, and McDonald describes cases in which handover is unsuccessful by using a busy OSW signal. Under the broadest reasonable construction, a combined system that can indicate either a successful handover using the features of Anderson or that no handover is possible using the features of McDonald is sufficient to meet the re-

quirements of the claims, which only recite that the network informs the mobile base station whether a handover is possible. We affirm the Board's findings that combining Anderson and McDonald discloses the informing the mobile station limitation.

D.

We next address the claim limitations calling for the use of different generations of radio communications standards recited in claims 23 and 25.[12] These claims recite that "the first base station and the second base station operate in respective parts of the network using different generations of radiocommunications standards for radio communication with the mobile station." J.A. 12571–72. The Board rejected claims 23 and 25 in view of Anderson, McDonald, and GSM. J.A. 18–20. The Board credited HTC's argument that GSM disclosed "a mobile station that is capable of communicating with upgraded GPRS or 2.5G base stations, as well as pre-existing GSM or 2G-only base stations." J.A. 19–20. It found that the base stations need not be incapable of communicating among themselves to facilitate handover, even if the specification discloses such an example, because the example from the specification should not be imported into the claims. J.A. 19–20.

IPCom argues on appeal that because the specification shows an example of different base stations that cannot communicate directly with each other when the base stations use different generations of radio communication standards, '830 patent col. 6 ll. 57–64, a person of ordinary skill in the art would understand claims 23 and 25 to require that those base stations be unable to communicate directly. Appellant Br. 52, 54–56. IPCom also

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[12] Claim 23 depends on claim 1 and claim 25 depends indirectly on claim 5. J.A. 12565–72.

argues that claim 5 (from which claim 25 indirectly depends) requires the same result because claim 5 recites that the mobile station transmits link data to a second base station "if the network cannot transfer the link data." Appellant Br. 54; J.A. 12567. IPCom contends that this limitation is missing from GSM because the base stations with and without GPRS in GSM can communicate directly with each other. Appellant Br. 55.

We disagree. We find that substantial evidence supports the Board's findings that GSM teaches the recited limitation of using different generations of radio communications standards because, as the Board found, GSM discloses using a mobile station that can communicate with both GSM/2G and GPRS/2.5G base stations, a finding that IPCom does not challenge. J.A. 19–20. Contrary to IPCom's position, claims 23 and 25 do not require that the base stations be incapable of communicating with each other; the claims simply require that the first and second base stations operate "using different generations of radiocommunications standards for radio communication with the mobile station." J.A. 12571–72. We agree that the specification's example of base stations incapable of communicating among themselves to facilitate handover should not be imported into claims 23 and 25.[13]

We also address IPCom's argument relating to claim 5, from which claim 25 indirectly depends through claim 11. Claim 5 does not require that the base stations be unable to transfer link data directly because it covers both networks that are capable of transferring link data and ones that are not capable of transferring link data. J.A. 12567. Claim 5 recites "causing the mobile station to

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[13] Because claim 23 depends from claim 1, which recites the "arrangement for reactivating the link" limitation, the Board must resolve this limitation from claim 1 before it can determine claim 23's patentability.

transmit the link data to the second base station, if the network cannot transfer the link data." *Id.* Claim 11 depends on claim 5, and claim 11 recites "causing the first base station to transfer the link data to the second base station if the network can transfer link data." J.A. 12567–68. Thus, claim 5 does not require that the network be unable to transfer link data, but it encompasses both types of networks—ones that can transfer the link data and ones that cannot transfer the link data—because claim 5 must include the scope of claim 11. We reject IPCom's argument that the base stations "using different generations of radiocommunications standards for radio communication with the mobile station" must be incapable of communicating directly with each, and we affirm the Board's finding that GSM discloses this limitation.

E.

We turn last to the motivation to combine McDonald, Anderson, GSM, and PACS. The Board rejected IPCom's arguments that it would not have been obvious to a person of ordinary skill in the art to combine either GSM or PACS with Anderson and McDonald based on the length of the references or because the combination would be inoperable. J.A. 13. The Board found that (1) Anderson and McDonald disclose methods of handover in a mobile telephone system; (2) GSM discloses a technical specification for handover procedures for mobile stations; and (3) PACS discloses mobile applications that include communications and handover methods among network components (e.g., PERFORM_ALT). J.A. 14. It further found that combining the known systems of handover for mobile stations in Anderson or McDonald with systems for handover discussed in GSM and PACS would have been obvious because it would have yielded no more than a predictable result. *Id.* (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007)).

IPCom argues that the Board engaged in impermissible hindsight to combine the references in the precise manner claimed by the '830 patent. IPCom contends that combining these references would not have yielded predictable results because Anderson relates to a system where the mobile system controls the handover, McDonald relates to a system where the user enters input that guides the handover, and GSM relates to a handover in which the network is in control. IPCom does not argue which entity is in control in PACS.

Substantial evidence supports the Board's motivation to combine findings. Both Anderson and McDonald teach solutions for solving the problem of an unsuccessful handover in a cellular telephone network, and each teach a means for returning to a first base station after a failed handover attempt to a second base station. As discussed above, McDonald teaches a method for a mobile station to return to the first base station after a failed handover attempt. McDonald col. 3 ll. 14–21. Similarly, Anderson discloses a "break before make" embodiment to prevent interrupted service, in which a mobile station that suddenly loses its connection with a first base station can quickly reacquire the first base station or acquire a different base station after a failed handover attempt. Anderson col. 18 ll. 16–24. A person of ordinary skill in the art would have been motivated to combine these teachings to solve the common problem of unsuccessful handovers. J.A. 13–14. Combining McDonald with Anderson's "make before break" embodiment also teaches the "informing the mobile station" limitation, as we discuss above. J.A. 6–8.

Anderson further discloses that its communication system can be combined with a GSM network. Anderson col. 4 ll. 40–44. McDonald contains a similar disclosure in its reference to "TDM time slots" because HTC's expert explained that at the time of the invention, "GSM was a common cellular protocol using TDM time slots." J.A. 12791–92; McDonald col. 1 ll. 24–26. Adding GSM to

Anderson and McDonald teaches the limitation of using different generations of radio communication standards in a cellular telephone network because GSM discloses using a mobile station that can communicate with both GSM/2G and GPRS/2.5G base stations. J.A. 19–20.

A person of ordinary skill would also have been motivated to combine Anderson or McDonald with PACS. Anderson describes a mobile-centric system designed to connect with different networks. Anderson col. 1 ll. 18–21, col. 4 ll. 40–51. The crossover between McDonald and PACS was also readily apparent for the same reasons. As discussed above, PACS discloses a "forced handover request message" by describing a PERFORM_ALT message transmitted from the network to a mobile station, a "handover query" by describing an ALT_REQ message, and a "rejection message" by describing an ALT_DENY message. J.A. 11, 13–14. PACS itself further discloses interfacing with GSM. J.A. 13885.

The Board correctly explained that both McDonald and Anderson disclose methods of handover for mobile telephone systems (including the "informing the mobile station" limitation), GSM discloses using a mobile station that can communicate with both GSM/2G and GPRS/2.5G base stations (which are different generations of radio communication standards), and PACS discloses using communication messages between base stations and mobile stations (including a forced handover request message, a handover query, and a rejection message). J.A. 14. In light of their interrelated teachings, combining these four known systems for handover and handoff for cellular telephone systems would have resulted in no more than the predictable result for a system for handing over mobile stations between base stations, consistent with the GSM and PACS industry standards. *Id.*

For these reasons, we affirm the Board's factual findings that the prior art discloses all the limitations of the

challenged claims on appeal, except for the "arrangement for reactivating the link" means-plus-function limitation. We also affirm the Board's finding of a motivation to combine McDonald, Anderson, GSM, and PACS to arrive at the combinations recited in the challenged claims except for the "arrangement for reactivating the link" limitation. We vacate and remand the Board's findings on the "arrangement for reactivating the link" limitation.

IV. The Board's Rejection of Claims 31–37

We briefly address IPCom's arguments that the Board lacked jurisdiction to consider the patentability of claims 31–37 during its second round of review. In its first decision in the reexamination proceeding, the Board did not address whether claims 31–37 should be regarded as obvious, J.A. 12475–76, as HTC had not expressly challenged those claims for obviousness in its first Notice of Appeal to the Board.[14] J.A. 8670–71. After the Board's first decision, IPCom reopened prosecution of claims 1, 5–26 and 28–37 and amended these claims, and HTC responded that the amended claims were unpatentable. J.A. 3, 5.

After IPCom filed its request to reopen prosecution in view of the Board's initial decision, the Board issued its Order Remanding Inter Partes Reexamination under 37 CFR 41.77(d) to the Examiner, granting IPCom's request to enter "claim amendments to claims 5, 12, 16, 18, 23, 25, 30, and 34" and ordering that "[t]his matter will be remanded to the Examiner for consideration of claims 1 and 5–37 in view of the newly submitted claim amendments,

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[14] HTC's first Notice of Appeal did challenge the Examiner's refusal to maintain rejections of claims 30–37 under 35 U.S.C. § 305 as enlarging the scope of the claims, J.A. 8671, but HTC did not maintain this argument in its appeal brief to the Board. J.A. 8814–25.

the declaration of [IPCom's expert], and Requester's response pertaining to the new grounds of rejection as enumerated in our prior Decision." J.A. 14422. The Board expressly explained that "[a]s Patent Owner observes (Request, p. 14), the new ground of rejection applies to claims 1 and 5–37." J.A. 14422 n.1. The Examiner then reviewed claims 1 and 5–37 in light of the new amendments, J.A. 14541, 14754, and found, as relevant here, claims 31–37 patentable based on IPCom's amendments.[15] J.A. 14547–48, 14757–61.

IPCom argues that when the reexamination returned to the Board for the second time, the Board lacked jurisdiction to consider the obviousness of claims 31–37 because, even though IPCom amended those claims when it reopened prosecution, claims 31–37 had not been part of the first Board appeal. There certainly was some confusion below about the impact of the Board's first decision on claims 31–37. For example, IPCom itself stated on the record below, after receiving the Board's first decision, that it "presume[d] that the Board intended to reject all claims that were subject to appeal, namely claims 1 and 5–37." J.A. 12577 n.1. IPCom's initial reaction to the Board's first decision is not surprising, since the Board's logic in rejecting claims 1, 5–26, and 28–30, appears to apply equally to claims 31–37. J.A. 12471–75.

More importantly, when IPCom reopened prosecution, it amended all of the pending claims, including claims 31–37. J.A. 12565–76. IPCom amended independent claims 30 and 34 to add the forced handover request, handover

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[15] When the reexamination returned to the Board, the Board reversed, initially addressing only claims 1 and 5–30, J.A. 15688, 15692, but it later issued a replacement decision, clarifying that IPCom had reopened prosecution of claims 1, 5–26, and 28–37, and it found those claims unpatentable. J.A. 2–5.

query, and rejection message limitations. J.A. 12572–74. IPCom also for the first time raised its claim construction argument on the "arrangement for reactivating the link" limitation in claims 1 and 18, a limitation that is also recited in both claims 30 and 34. J.A. 12565–74. IPCom explained that this construction was "new evidence in this examination; it was not available when the Patent Owner filed its [prior] responses." J.A. 12582. Although dependent claims 31–33 and 35–37 were not directly amended, they were indirectly amended because they depend on amended claim 30 or 34. J.A. 12572–74. By amending claims 31–37, IPCom altered the scope of these claims, and this opened the door to permit HTC to challenge the amended claims.

IPCom also argues that the Board lacked jurisdiction to consider claims 31–37 because HTC's notice of appeal in the first Board appeal did not challenge claims 31–37 as to obviousness. J.A. 8670–71. However, IPCom cites no authority (other than an inapposite Board decision that found that a proposed obviousness rejection was waived)[16] to support IPCom's argument that the Board's jurisdiction in the second round before the Board is limited by HTC's Notice of Appeal in the first round. Reply Br. 26–27. We find that in its second decision (which is the one on appeal), the Board properly considered HTC's challenge to claims 31–37 after IPCom had reopened prosecution and amended those claims.

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[16] *Google Inc. v. Netlist, Inc.*, No. 2014-007777, 2015 WL 799035, at *8 (P.T.A.B. Feb. 24, 2015) (finding that a requester's arguments opposing an examiner's nonadoption of a proposed rejection for obviousness were waived because the requester did not identify that issue in its Notice of Cross Appeal).

CONCLUSION

For the foregoing reasons, we affirm in part, vacate in part, and remand for consideration in light of this opinion. We vacate and remand the Board's finding of obviousness of independent claims 1, 18, 30, and 34, and their corresponding dependent claims based on the "arrangement for reactivating the link" means-plus-function limitation. We affirm the Board's findings that the prior art discloses all the other limitations of the challenged claims on appeal, and the motivation to combine McDonald, Anderson, GSM, and PACS to arrive at claims 5–17 and 25. We affirm the Board's finding of obviousness with respect to claims 5–17 and 25.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

No costs.