

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

NETWORK-1 TECHNOLOGIES, INC.,
Plaintiff-Appellant

v.

**HEWLETT-PACKARD COMPANY, HEWLETT
PACKARD ENTERPRISE COMPANY,**
Defendants-Cross-Appellants

2018-2338, 2018-2339, 2018-2395, 2018-2396

Appeals from the United States District Court for the Eastern District of Texas in Nos. 6:11-cv-00492-RWS, 6:13-cv-00072-RWS, Judge Robert Schroeder, III.

OPINION ISSUED: September 24, 2020
OPINION MODIFIED: November 20, 2020*

GREGORY S. DOVEL, Dovel & Luner, LLP, Santa Monica, CA, argued for plaintiff-appellant. Also represented by SEAN LUNER, RICHARD ELGAR LYON, III; JEFFREY A. LAMKEN, MoloLamken LLP, Washington, DC.

MARK ANDREW PERRY, Gibson, Dunn & Crutcher LLP,

* This opinion has been modified and reissued following a petition for panel rehearing filed by Appellant.

Washington, DC, argued for defendants-cross-appellants. Also represented by OMAR FAROOQ AMIN; HERSH H. MEHTA, Morgan, Lewis & Bockius LLP, Chicago, IL; NATALIE A. BENNETT, Washington, DC.

ANDREW M. MASON, Klarquist Sparkman, LLP, Portland, OR, for amicus curiae T-Mobile USA, Inc. Also represented by SARAH ELISABETH JELSEMA, JOHN D. VANDENBERG; SARAH J. KALEMERIS, Winston & Strawn LLP, Chicago, IL.

Before PROST, *Chief Judge*, NEWMAN and BRYSON,
Circuit Judges.

PROST, *Chief Judge*.

Network-1 Technologies, Inc. (“Network-1”) appeals a final judgment of the United States District Court for the Eastern District of Texas. Network-1 sued Hewlett-Packard (“HP”), alleging infringement of U.S. Patent No. 6,218,930 (“the ’930 patent”). HP argued in response that the ’930 patent is invalid, and that HP did not infringe. The jury found the patent not infringed and invalid. Following post-trial motions, the district court denied Network-1’s request for a new trial on infringement but granted Network-1’s motion for judgment as a matter of law (“JMOL”) on validity.

Network-1 appeals the district court’s final judgment that HP does not infringe the ’930 patent, arguing the district court erred in its claim construction. HP cross-appeals the district court’s determination that HP was estopped from raising certain validity challenges under 35 U.S.C. § 315(e)(2) based on HP’s joinder to an inter partes review (“IPR”) before the Patent Trial and Appeal Board (“Board”). On cross-appeal, HP also argues that Network-1 improperly broadened claim 6 of the ’930 patent during reexamination.

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For the reasons explained below, we affirm-in-part, reverse-in-part, vacate, and remand. Specifically, as to Network-1's appeal, we affirm-in-part and reverse-in-part the district court's claim construction and remand to the district court. As to HP's cross-appeal, we vacate the district court's JMOL on validity and remand. And finally, we affirm the district court's decision with respect to improper claim broadening.

FACTUAL BACKGROUND

I. The '930 Patent

The '930 patent is titled "Apparatus and Method for Remotely Powering Access Equipment over a 10/100 Switched Ethernet Network." It discloses an apparatus and methods for allowing electronic devices to automatically determine if remote equipment is capable of accepting remote power over Ethernet. *See* '930 patent col. 1 ll. 13–17. According to the patented method, a "low level current" is delivered over a data signaling pair to an access device (also called remote equipment or remote access equipment). *Id.* at col. 2 ll. 8–10. After the low level current is sent, a network switch senses the resulting "voltage level" on the data signaling pair. *Id.* at col. 1 l. 65–col. 2 l. 14. If the device can accept remote power, the sensed voltage level will match a "preselected condition" of the voltage, such as a particular "varying voltage" level. *Id.* at col. 2 ll. 10–14, col. 3 ll. 2–17. Upon detecting the preselected condition, the network switch will increase the current from the low level to a higher level sufficient to allow the "remote equipment [to] become[] active." *Id.* at col. 3 ll. 17–22. If the preselected condition of the voltage is not detected, the network switch will determine that the device cannot accept remote power and will not transmit a higher current. *Id.* at col. 3 ll. 3–11.

The '930 patent issued in April 2001 with 9 claims, including two independent claims: claims 1 and 6. Claim 6 is representative of the issues on appeal. Claim 6 recites:

6. Method for remotely powering access equipment in a data network, comprising,

providing a data node adapted for data switching, an access device adapted for data transmission, at least one data signaling pair connected between the data node and the access device and arranged to transmit data therebetween, a *main power source* connected to supply power to the data node, and a secondary power source arranged to supply power from the data node via said data signaling pair to the access device,

delivering a *low level current* from said main power source to the access device over said data signaling pair,

sensing a voltage level on the data signaling pair in response to the low level current, and

controlling power supplied by said *secondary power source* to said access device in response to a preselected condition of said voltage level.

'930 patent claim 6 (emphases added to terms challenged on appeal).

On appeal, Network-1 contends that the district court erroneously construed the claim terms “main power source” and “low level current.” On cross-appeal, HP contends that Network-1 improperly broadened the term “secondary power source” during reexamination.

II. The Reexamination Proceedings

After it issued, and concurrent with the underlying district court action, the '930 patent was reexamined twice before the U.S. Patent and Trademark Office. The first reexamination, No. 90/012,401 (“the '401 reexamination”), concluded in October 2014. *See* J.A. 333–35. It confirmed the patentability of claims 6, 8, and 9, and resulted in the issuance of claims 10–23. Relevant to HP’s cross-appeal,

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claims 15 and 16 were added depending from original claim 6.

Claim 15 recites: “Method according to claim 6, wherein said **secondary power source** is the same source of power as said main power source.” ’930 patent, Ex Parte Reexamination Certificate, col. 1 ll. 39–41 (emphasis added).

Claim 16 recites: “Method according to claim 6, wherein said **secondary power source** is the same physical device as the main power source.” *Id.* at col. 1 ll. 42–44 (emphasis added).

The second reexamination, No. 90/013,444, concluded in November 2015. It confirmed the patentability of claims 6 and 8–23. *See* J.A. 336–37.

PROCEDURAL BACKGROUND

This case has a long and complicated history, which began in 2011 when Network-1 sued a number of defendants, including HP, for infringement of the ’930 patent in the U.S. District Court for the Eastern District of Texas. After several stays, the district court finally reached the underlying final judgment in 2018. We discuss the relevant background here.

I. The Avaya IPR

After Network-1 filed its complaint in the district court, another defendant, Avaya Inc. (“Avaya”), petitioned for IPR of the ’930 patent. The district court stayed its proceedings pending IPR. The Board partially instituted Avaya’s petition. *See Avaya Inc. v. Network-1 Sec. Sols., Inc.*, No. IPR2013-00071, Paper 18, 2013 WL 8595554 (P.T.A.B. May 24, 2013) (“the Avaya IPR”). Specifically, the Board instituted review of claims 6 and 9 of the ’930 patent based on two grounds: (1) anticipation under

35 U.S.C. § 102(b) by Matsuno¹; and (2) obviousness under 35 U.S.C. § 103(a) by De Nicolo² and Matsuno. *Id.* at *16.

Following institution, HP, together with other petitioners, filed an IPR petition and motion to join the Avaya IPR. HP's petition included grounds different from those that had already been instituted. The Board denied HP's request. HP, with others, thereafter filed a second IPR petition and motion to join the Avaya IPR, this time including only the grounds already instituted. The Board granted HP's request, and HP was joined as a party to the Avaya IPR. At the time that HP filed its second IPR petition, more than one year had passed since the district court complaint had been served, and therefore, HP was time-barred under 35 U.S.C. § 315(b) from having its own petition instituted. But because § 315(b) creates an exception from the time bar for joinder under 35 U.S.C. § 315(c), HP was nonetheless able to join.

In its final written decision, the Board held that neither claim 6 nor claim 9 was unpatentable over the instituted grounds. We affirmed. *See Avaya Inc. v. Network-1 Techs., Inc.*, 612 F. App'x 613 (Fed. Cir. 2015).

II. The District Court Action

After more stays, Network-1 continued its suit in the district court. In 2017, the district court issued its construction of disputed claim terms, including “low level current” and “main power source.” *See Network-1 Techs., Inc. v. Alcatel-Lucent USA, Inc., ET*, No. 6:11-cv-492, Report and Recommendation of the Magistrate Judge, D.I. 693, at 12 (E.D. Tex. Nov. 4, 2016) (J.A. 24–48); *see also Network-1 Techs., Inc. v. Alcatel-Lucent USA, Inc., ET*, No.

¹ Japanese Unexamined Patent Application Publication No. H10-13576, published Jan. 16, 1998 (“Matsuno”).

² U.S. Patent No. 6,115,468, filed Mar. 26, 1998, issued Sept. 5, 2000 (“De Nicolo”).

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6:11-cv-492, Order Adopting Report and Recommendation of U.S. Magistrate Judge, D.I. 860, at 1, 5–7 (E.D. Tex. May 2, 2017) (J.A. 49–68). Together with its claim construction, in relevant part, the district court denied HP’s summary judgment motion that argued claim 6 was impermissibly broadened through the ’401 reexamination. J.A. 40–42, 57–59.

This case finally proceeded to trial in November 2017. At trial, Network-1 argued that HP infringed claims 6, 13, 14, 17, 20, and 22 of the ’930 patent (“the asserted claims”) by selling particular Power over Ethernet (“PoE”) switches. HP argued that each of the asserted claims was rendered obvious by both public use of “the Fisher system,” which was a PoE system developed by David Fisher, and by the patents and printed publications referred to as “the Fisher patents,”³ Woodmas,⁴ and Chang.⁵ See J.A. 78.

Using a general verdict form, the jury found that HP did not infringe any asserted claim of the ’930 patent. J.A. 70. The jury also found that HP had shown that all asserted claims of the ’930 patent are invalid. J.A. 71.

Following the jury’s verdict, Network-1 filed, in relevant part, a motion for a new trial related to infringement, and a motion for JMOL and motion for a new trial related

³ U.S. Patent No. 5,994,998, filed May 29, 1997, issued Nov. 20, 1999; U.S. Patent No. 6,710,704, filed Oct. 28, 2002, issued Mar. 23, 2004; International Publication No. WO 98/54843, published Dec. 3, 1998 (collectively, “the Fisher patents”).

⁴ U.S. Patent No. 5,345,592, filed Apr. 8, 1992, issued Sept. 6, 1994 (“Woodmas”).

⁵ U.S. Patent No. 5,991,885, filed June 11, 1997, issued Nov. 23, 1999; International Publication No. WO 98/57248, published Dec. 17, 1998 (collectively, “Chang”).

to validity. The district court denied the motion for a new trial on infringement. Applying its construction of the claim terms “low level current” and “main power source,” the district court concluded that the jury’s verdict was not against the great weight of the evidence that HP’s accused devices did not meet either limitation. *See* J.A. 92–97.

As to the ’930 patent’s validity, however, the district court granted Network-1’s motion for JMOL. The district court concluded that because of HP’s joinder to the Avaya IPR, HP should have been estopped under 35 U.S.C. § 315(e) from raising the remaining obviousness challenges, which it determined “reasonably could have been raised” in the Avaya IPR. J.A. 91.⁶ The district court did not conditionally rule on HP’s motion for a new trial with respect to validity.

Network-1 appealed. HP cross-appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

On appeal, Network-1 challenges the district court’s denial of a new trial on infringement based on its argument that the district court erred in its claim construction.

On cross-appeal, HP challenges the district court’s JMOL on validity, arguing that the district court erred in concluding that HP is estopped from raising its obviousness challenges because it joined the Avaya IPR. HP further challenges the district court’s denial of summary

⁶ With respect to the Fisher system, the district court concluded that HP failed to show that the Fisher system constitutes prior art. *See* J.A. 79–87. On cross-appeal, HP does not challenge the district court’s conclusion that the Fisher system does not constitute prior art. Appellee’s Br. 62 n.2.

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judgment, arguing that the asserted claims of the '930 patent were improperly broadened during reexamination.

We address these issues in turn.

I. Claim Construction

Network-1 argues that the district court incorrectly construed the claim terms “low level current” and “main power source,” and that this error entitles it to a new trial on infringement. HP argues in response that the district court’s claim construction should be affirmed, but that even if it is not, Network-1 was not prejudiced by the erroneous claim construction.

For the below-described reasons, we conclude that the district court correctly construed “low level current” but erred in its construction of “main power source,” and as a result of that error, Network-1 is entitled to a new trial on infringement. We therefore vacate the district court’s judgment of non-infringement and remand for a new trial to determine whether HP infringes the asserted claims based on the correct construction of “main power source.”

A

We review the district court’s ultimate construction of the claim language de novo. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015). “[W]hen the district court reviews only evidence intrinsic to the patent (the patent claims and specifications, along with the patent’s prosecution history), the judge’s determination will amount solely to a determination of law, and [we] will review that construction de novo.” *Id.* To the extent that subsidiary factfinding is required for claim construction analysis, we review such factfinding for clear error. *Id.* at 332.

Claim terms “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips v. AWH Corp.*,

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415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc) (internal quotation marks and citations omitted). “[T]he claims themselves provide substantial guidance as to the meaning of particular claim terms” and “the specification is the single best guide to the meaning of a disputed term.” *Id.* at 1314–15 (internal quotation marks and citations omitted).

As the party seeking to disturb the non-infringement judgment, Network-1 “must establish that [the challenged jury] instructions were legally erroneous, and that the errors had prejudicial effect.” *SSL Servs., LLC v. Citrix Sys.*, 769 F.3d 1073, 1085 (Fed. Cir. 2014) (quoting *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1373 (Fed. Cir. 2002)).

“It is well established that when an incorrect jury instruction—such as an incorrect claim construction—removes from the jury a basis on which the jury could reasonably have reached a different verdict, the verdict should not stand.” *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371, 1383 (Fed. Cir. 2004); *see also Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1042 (Fed. Cir. 2016). An erroneous claim construction on one element is harmless “only if a reasonable jury would have been required by the evidence to find non-infringement even without the error.” *Avid*, 812 F.3d at 1047.

B

The district court construed “low level current” as “a non-data-signal current that is sufficient to begin start up of the access device but that is not sufficient to sustain the start up.” J.A. 35; *see also* J.A. 53–55. The district court explained that it was construing the disputed phrase to give meaning to the constituent term “low.” *See* J.A. 34. It stated that while the current must be sufficient to “begin start up,” the current need not “cause start up,” and thus it construed the term to eliminate “any implication that the current must be sufficient to result in a completed start-up.” J.A. 34 (citing ’930 patent col. 3 ll. 12–17).

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On appeal, Network-1 argues that the district court erred by construing the phrase “low level current” to have a lower bound. Network-1 agrees that, in the context of the ’930 patent, the phrase “low level current” describes current that cannot “sustain start up” but argues that it was error for the district court to additionally require that the current be sufficient to *begin* start up. See Appellant’s Br. 27. Relying on extrinsic evidence related to the word “low,” including dictionary definitions, grammar references, and claim constructions adopted for unrelated patents, Network-1 argues that the term points in one direction and should be construed to have a single reference point. Network-1 asserts that the correct reference point with respect to the ’930 patent is the upper boundary requiring that the current not exceed the level needed to operate the device. We disagree.

We conclude that the district court correctly construed “low level current.” As an initial matter, there is no dispute that the word “low” in the claim phrase “low level current” operates to limit the upper boundary of the current level. See Appellant’s Br. 26–29; Appellee’s Br. 36–37. Indeed, the ’930 patent explicitly describes a low level current with an upper boundary that is “unable to sustain start up.” See ’930 patent col. 3 ll. 14–16; *see also id.* at col. 3 ll. 2–13. But the claim phrase is not limited to the word “low,” and the claim construction analysis should not end just because one reference point has been identified. To be sure, the claim phrase “low level current” does not preclude a lower bound by use of the word “low.” Rather, in the same way the phrase should be construed to give meaning to the term “low,” the phrase must also be construed to give meaning to the term “current.”

The intrinsic record of the ’930 patent confirms that the district court correctly construed the phrase to require a lower boundary of current. See *Phillips*, 415 F.3d at 1315. Claim 6 recites “*delivering* a low level current” to an access device to detect whether the device can accept remote

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power. '930 patent col. 4 ll. 49–67 (emphasis added); *see also id.* at col. 2 ll. 8–14. The express language of the claim thus requires that at least some level of current be delivered. Even Network-1 admits that the term “current” necessarily requires some flow of electric charge because “[i]f there is no flow, there is no ‘current.’” *See* Appellant’s Br. 33–34.

The specification of the '930 patent discloses the lower boundary of current. It explains that an access device capable of accepting remote power will signal a varying voltage level and teaches “[t]he varying level is created by the remote power supply *beginning to start up* but the low current level is unable to sustain the start up.” '930 patent col. 3 ll. 14–16 (emphasis added); *see also id.* at col. 3 ll. 2–13. Thus, consistent with the district court’s construction, the '930 patent teaches that the delivered “low level current” is current that is sufficient to begin start-up.

Accordingly, we conclude that the district court did not err in its construction of “low level current.”

C

The district court construed “main power source” as “a DC power source,” and thereby excluded AC power sources from its construction. J.A. 50–51.⁷ In reaching its decision, the court relied on HP’s expert testimony that a network device would either fail to function or would be damaged if it received AC power. J.A. 50–51. The court therefore concluded that embodiments using AC power are inoperable and construed “main power source” to exclude such embodiments. J.A. 50–51 (“A construction that renders the claimed invention inoperable should be viewed with extreme skepticism.” (quoting *Talbert Fuel Sys. Pats. Co. v.*

⁷ “DC” refers to direct current and “AC” refers to alternating current.

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Unocal Corp., 275 F.3d 1371, 1376 (Fed. Cir. 2002)); *see also* J.A. 30–31.

On appeal, Network-1 argues that the claim phrase “main power source” should be construed consistent with the ordinary meaning of “power source” to include both AC and DC power sources. *See* Appellant’s Br. 46. Network-1 acknowledges that certain embodiments with AC power sources require power from the main power source to be converted to DC power before being received by the network device, but Network-1 argues that nothing in the ’930 patent precludes such embodiments. To the contrary, Network-1 asserts that the intrinsic record supports a construction that includes both types of power sources. We agree and reverse the district court’s construction of main power source.

We conclude that the correct construction of “main power source” includes both AC and DC power sources. There is no dispute that the ordinary meaning of “power source” includes both AC and DC power sources. Appellant’s Br. 45–49; *see* Appellee’s Br. 47. And neither the claims nor the specification of the ’930 patent require a departure from this ordinary meaning. *Starhome GmbH v. AT & T Mobility LLC*, 743 F.3d 849, 857 (Fed. Cir. 2014) (“In the absence of an express intent to impart a novel meaning to claim terms, an inventor’s claim terms take on their ordinary meaning.”).

Claim 6 recites a “main power source” that is “connected to supply power to the data node” and that “deliver[s] a low level current . . . to the access device.” ’930 patent col. 4 ll. 56–57, ll. 60–61; *see also id.* at col. 1 ll. 64–65, col. 2 ll. 8–9. Nowhere do the claims suggest that the “main power source” should be limited to DC power sources.

The specification likewise never expresses a preference for DC power sources, much less a suggestion that DC power is an “essential” feature of the main power source.

See GE Lighting Sols., LLC v. AgiLight, Inc., 750 F.3d 1304, 1309–10 (Fed. Cir. 2014). Indeed, far from limiting the plain language of the claims to a DC power source, the specification states that the power source may be a “conventional main power supply,” which according to the ordinary meaning would include both AC and DC power sources. ’930 patent col. 2 ll. 52–53. This reading of the specification is further confirmed by the ’930 patent’s disclosure of a preferred embodiment, which is shown in Figures 1 and 3. *See MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007) (“A claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.” (internal citation omitted)). In Figure 1, power source 16 is identified as a “conventional” power supply, and in Figure 3, main power supply 70 is specifically depicted as a traditional AC power outlet. ’930 patent col. 2 ll. 52–53, Fig. 3.

Despite the express disclosures of the ’930 patent, the district court construed “main power source” to exclude AC power sources on the basis of expert testimony that receipt of AC power by a network device would render it inoperable. J.A. 30–31, 50–51. This is error for two reasons. First, even though the network device cannot receive AC power, the record establishes that “data nodes” or network switches were commonly used to convert AC power to DC power as needed to power the network device. Indeed, we need not look beyond the specification of the ’930 patent. In the preferred embodiment, as shown in Figure 1, a data node exists between main power source 16 and the remote equipment. And in Figure 3, an 8-port switch is shown connected to the AC power outlet such that the AC power is converted to DC power before reaching the network device. ’930 patent col. 2 l. 29, col. 3 ll. 59–60, Figs. 1 & 3. Even HP’s expert Dr. Neikirk explained that Figure 3 illustrates “the main power supply 70’ receiving power from a typical AC wall socket, and in turn suppl[y]ing operational power via the ‘Main Power Distribution Bus’ to the data

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switches.” J.A. 1049 ¶ 35. Nothing in the claims of the ’930 patent precludes the conversion of AC power to DC power, and it was error for the district court to add such a limitation.

Second, the district court erred by adding a limitation to the claims to carve out certain inoperable embodiments. To be sure, we have stated that we skeptically view a construction that renders all embodiments inoperable, but we have instructed that it is nonetheless improper to add limitations to constructions to exclude only certain inoperable embodiments. *Cordis Corp. v. Medtronic AVE, Inc.*, 511 F.3d 1157, 1174 (Fed. Cir. 2008). In this case, the district court’s construction not only excluded inoperable embodiments that do not convert AC to DC power, but also excluded operable embodiments, like the preferred embodiment. *See MBO Labs.*, 474 F.3d at 1333.

Accordingly, we conclude that the district court erred in its construction of “main power source.”

D

We now consider the effect of the district court’s erroneous construction of “main power source” on the jury’s verdict of non-infringement. Network-1 argues that if the district court erred in its construction of either claim term, that error was prejudicial, and it is entitled to a new trial on infringement. HP argues in response that to the extent either term was misconstrued, such error was harmless and the judgment of non-infringement should not be disturbed. We conclude that Network-1 established that it was prejudiced by the district court’s erroneous claim construction of “main power source” and is entitled to a new trial on infringement.

At trial, HP contested infringement based on the elements “low level current” and “main power source.” With respect to “main power source,” the record shows that the jury was instructed to apply the erroneous construction,

that Network-1 elicited testimony showing that the main power source for certain HP products originates at an AC input, J.A. 2291, 2056, and that HP relied on evidence of non-infringement, at least in part, based on the fact that these products are not within the scope of the '930 patent because they use an AC input, J.A. 2056–57, 2065–66. The jury found that HP did not infringe the asserted claims of the '930 patent. Because the general verdict form does not indicate the basis for the jury's decision, where the evidence shows that HP relied on the district court's erroneous construction for its argument that it does not infringe the asserted claims, we conclude that Network-1 has established that it was prejudiced by the claim construction. J.A. 69–70.

HP argues that the erroneous claim construction was harmless because HP presented conclusive evidence that no accused product meets the claim limitation “*delivering* a low level current *from* said main power source.” Appellee's Br. 25–26 (emphases in original). More particularly, HP argues that the record shows that its products deliver detection current from a PoE chip, not an AC or DC power source. But HP's argument relies on an element that is not in the claims—namely, that current be delivered *directly* from the main power source to the access device. Indeed, the district court expressly rejected HP's attempt to import such a limitation during claim construction. *See* J.A. 39–40. And in any case, Network-1 presented evidence at trial showing that HP's products practice this claim limitation. *See, e.g.*, J.A. 1790–95, 2480–81, 2724. We therefore reject HP's argument that the non-infringement verdict may be affirmed on appeal.

Accordingly, we affirm the district court's construction of “low level current,” reverse the district court's construction of “main power source,” and remand to the district court for proceedings consistent with this opinion.

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II. Statutory Estoppel

We now turn to HP's cross-appeal. HP argues that the district court erroneously granted JMOL with respect to the '930 patent's validity based on its determination that HP was estopped under 35 U.S.C. § 315(e) from presenting obviousness challenges as a consequence of its joinder to the Avaya IPR. We agree that HP is not estopped. We therefore vacate the district court's judgment and remand to the district court for proceedings consistent with this opinion.

A

We review "decisions on motions for JMOL, motions for a new trial, and evidentiary rulings under the law of the regional circuit." *SSL Servs.*, 769 F.3d at 1082. The Fifth Circuit reviews decisions on motions for JMOL "de novo, reapplying the JMOL standard." *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1293 (Fed. Cir. 2015) (citing *Ford v. Cimarron Ins. Co.*, 230 F.3d 828, 830 (5th Cir. 2000)). In the Fifth Circuit, a jury verdict may only be reversed by JMOL if substantial evidence does not support the verdict. *Versata Software, Inc. v. SAP Am., Inc.*, 717 F.3d 1255, 1261 (Fed. Cir. 2013). "Thus, a JMOL may only be granted when, 'viewing the evidence in the light most favorable to the verdict, the evidence points so strongly and overwhelmingly in favor of one party that the court believes that reasonable jurors could not arrive at any contrary conclusion.'" *Id.* (quoting *Dresser-Rand Co. v. Virtual Automation, Inc.*, 361 F.3d 831, 838 (5th Cir. 2004)).

B

Following trial, the district court granted Network-1's motion for JMOL on validity of the '930 patent. The district court concluded that as a result of HP's joinder to the Avaya IPR, HP was estopped under 35 U.S.C. § 315(e) from raising obviousness challenges not based on the Fisher

system. J.A. 91. According to the district court, in contrast to the Fisher system, which was not a patent or printed publication that HP “reasonably could have raised” in the IPR, HP could have reasonably raised its remaining invalidity arguments during the IPR—i.e., the Fisher patents, Woodmas, and Chang. J.A. 88–89, 91 (quoting 35 U.S.C. § 315(e)(2)). In reaching this conclusion, the district court specifically rejected HP’s argument that it could not have raised new grounds in the Avaya IPR because it was a joined party. The district court stated that “the fact that HP sought joinder with Avaya’s IPR does not mean that HP could not have reasonably raised different grounds from those raised by Avaya.” J.A. 91. The district court further stated that allowing HP to raise arguments “that it elected not to raise during the IPR would give it a second bite at the apple and allow it to reap the benefits of the IPR without the downside of meaningful estoppel.” J.A. 91 (internal quotations omitted). The district court therefore granted JMOL on validity without considering the merits of HP’s invalidity arguments. J.A. 91 & n.6.

HP argues that, in granting Network-1’s motion for JMOL on invalidity, the district court misapplied the estoppel provision under 35 U.S.C. § 315(e)(2). Specifically, HP argues that no validity ground that it raised at trial “reasonably could have [been] raised” through its joinder to the Avaya IPR. *See* J.A. 88–91. We agree with HP. HP’s joinder to the Avaya IPR and the estoppel consequences of that joinder are governed by the America Invents Act (“AIA”), which established IPR proceedings. According to the AIA, under 35 U.S.C. § 315(c), HP was permitted to join the Avaya IPR “as a party” even though HP was time-barred under § 315(b) from bringing its own petition. But, as we held in *Facebook, Inc. v. Windy City Innovations, LLC*, the joinder provision does not permit a joining party to bring into the proceeding new grounds that were not already instituted. *Facebook, Inc. v. Windy City Innovations, LLC*, __ F.3d __, No. 18-1400, 2020 WL 5267975, at *9–10

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(Fed. Cir. Sept. 4, 2020). Rather, it may only join the already-instituted proceeding as a party. *Id.*

Following a final written decision in an IPR, the AIA provides for statutory estoppel under 35 U.S.C. § 315(e) to limit the invalidity challenges that an IPR petitioner may bring in a separate action involving the same patent claims. With respect to district court actions, § 315(e)(2) states:

CIVIL ACTIONS AND OTHER PROCEEDINGS.—The petitioner in an inter partes review of a claim in a patent under this chapter *that results in a final written decision* under section 318(a) . . . may not assert in . . . a civil action arising in whole or in part under section 1338 of title 28 . . . that the claim is invalid on any ground that the petitioner raised or *reasonably could have raised* during that inter partes review.

35 U.S.C. § 315(e)(2) (emphases added). Thus, according to the statute, a party is only estopped from challenging claims in the final written decision based on grounds that it “raised or reasonably could have raised” during the IPR. Because a joining party cannot bring with it grounds other than those already instituted, that party is not statutorily estopped from raising other invalidity grounds.

In this case, the Board instituted two grounds in the Avaya IPR, which challenged claims 6 and 9 of the ’930 patent based on Matsuno and De Nicolo. HP did not timely petition for IPR but relied on the joinder exception to the time bar under § 315(b). HP first filed a motion to join the Avaya IPR with a petition requesting review based on grounds not already instituted. The Board correctly denied HP’s request. The Board, however, granted HP’s second joinder request, which petitioned for only the two grounds already instituted. When the Board reached a final written decision in the Avaya IPR, because HP was a petitioner in that proceeding, HP was statutorily estopped from raising

invalidity grounds based on Matsuno and De Nicolo against claims 6 and 9 in a district court action. HP, however, was not estopped from raising other invalidity challenges against those claims because, as a joining party, HP could not have raised with its joinder any additional invalidity challenges. Thus, contrary to the district court's suggestion, permitting HP to challenge the asserted claims of the '930 patent as obvious over the Fisher patents, Woodmas, and Chang does not give HP a "second bite at the apple" to challenge the '930 patent, J.A. 91, because HP could not have raised such a challenge in the Avaya IPR.

Accordingly, we conclude that HP was not statutorily estopped under § 315(e) from challenging the asserted claims of the '930 patent based on the Fisher patents, Woodmas, and Chang, which were not raised in the Avaya IPR and which could not have reasonably been raised by HP. We therefore vacate the district court's JMOL decision on validity with respect to estoppel.

C

Because we conclude that the district court erred in granting JMOL of validity for Network-1 on the basis that HP was statutorily estopped from raising certain invalidity challenges, we vacate that decision.

HP argues that if we vacate the district court's JMOL on validity, substantial evidence supports the jury's verdict of invalidity, and thus the jury's verdict should be reinstated. In response, Network-1 argues that even if we reverse on estoppel, we might affirm the JMOL on alternative grounds relating to substantive validity arguments in Network-1's JMOL motion that the district court did not reach. Network-1 also argues that there is an outstanding new-trial motion that must be ruled upon. Indeed, the district court failed to conditionally rule on Network-1's motion for a new trial on validity even though

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it was required to do so by Federal Rule of Civil Procedure 50(c). *See* J.A. 78–91, 9260–65. We will not consider either Network-1’s alternative grounds for JMOL or its new-trial motion in the first instance. We therefore remand to the district court for further proceedings consistent with this opinion, which include ruling in the first instance on Network-1’s entitlement to JMOL (notwithstanding this court’s holding on estoppel) and its new-trial motion.

III. Claim Broadening

On cross-appeal, HP also argues that claim 6 and the other asserted claims are invalid under 35 U.S.C. § 305 because Network-1 improperly broadened claim 6 through the addition of claim 15 and 16 in the ’401 reexamination. We disagree and affirm the district court’s judgment that the asserted claims were not improperly broadened.

A

A patentee is not permitted to enlarge the scope of a patent claim during reexamination. 35 U.S.C. § 305. The broadening inquiry under § 305 involves two steps: (1) “analyz[ing] the scope of the claim prior to reexamination” and (2) “compar[ing] it with the scope of the claim subsequent to reexamination.” *Creo Prods., Inc. v. Presstek, Inc.*, 305 F.3d 1337, 1344 (Fed. Cir. 2002). A claim “is broader in scope than the original claims if it contains within its scope any conceivable apparatus or process which would not have infringed the original patent.” *See Predicate Logic, Inc. v. Distributive Software, Inc.*, 544 F.3d 1298, 1303 (Fed. Cir. 2008).

“Whether amendments made during reexamination enlarge the scope of a claim is a matter of claim construction,” *Creo Prods.*, 305 F.3d at 1344, which we review de novo, while giving deference to subsidiary factual determinations, *Teva Pharms.*, 574 U.S. at 331.

B

HP argues that dependent claims 15 and 16 added during the '401 reexamination resulted in improper claim broadening of claim 6 and asserted dependent claims. In relevant part, prior to reexamination, claim 6 of the '930 patent was construed in two separate district court actions to require the “secondary power source” to be physically separate from the “main power source.” *See* J.A. 59–62; *see also* J.A. 40–42. Subsequently, during the '401 reexamination, Network-1 added claims 15 and 16, which depended from claim 6 and respectively added the limitations that the secondary power source “is the same source of power” and “is the same physical device” as the main power source. '930 patent, Ex Parte Reexamination Certificate, col. 1 ll. 39–44.

After claims 15 and 16 issued at the conclusion of the '401 reexamination, HP moved in the underlying district court action for summary judgment of invalidity under 35 U.S.C. § 305 for improper claim broadening. Network-1 subsequently filed a statutory disclaimer under 35 U.S.C. § 253 of claims 15 and 16. *See* J.A. 5075. Ultimately, the district court denied HP's motion, finding that claim 6 had not been improperly broadened. J.A. 59–62; *see also* J.A. 40–42. In the same order, the district court also construed the claim term “secondary power source” consistent with the earlier district court actions to require that the “secondary power source be physically separate from the driving points of the main power source.” J.A. 52–53; *see also* J.A. 32–33.

We do not agree that claim 6 is invalid for improper broadening based on the addition of claims 15 and 16. Our broadening inquiry begins and ends with claim 6. Claim 6 was not itself amended during the '401 reexamination. And as HP admits, “[t]he district court's construction [after reexamination] is consistent with how the [earlier district] courts construed this term [pre-reexamination].”

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Appellee's Br. 15. Neither party appeals that construction. There can be no dispute, therefore, that the scope of claim 6 was not changed as a result of the '401 reexamination. Where the scope of claim 6 has not changed, there has not been improper claim broadening, and HP's argument fails. *See Creo Prods.*, 305 F.3d at 1344.

Furthermore, our precedent is clear that "dependent claims cannot broaden an independent claim from which they depend." *Enzo Biochem Inc. v. Applera Corp.*, 780 F.3d 1149, 1156–57 (Fed. Cir. 2017). Thus, even were dependent claims 15 and 16 broader than unamended, independent claim 6, the remedy would not be to find claim 6 invalid as broadened, but to invalidate added claims 15 and 16. *See MBO Labs., Inc. v. Becton, Dickinson & Co.*, 602 F.3d 1306, 1319 (Fed. Cir. 2010). We need not determine whether claims 15 and 16 are invalid because they are not asserted and because those claims have already been canceled through Network-1's statutory disclaimer.

Despite the clarity of our caselaw, HP principally relies on *ArcelorMittal France v. AK Steel Corp.*, 786 F.3d 885 (Fed. Cir. 2015), to argue that claim 6 was improperly broadened and should be invalidated. In that case, we concluded that the patentee had improperly broadened independent claim 1 through reissue by adding a number of dependent claims. *See ArcelorMittal*, 786 F.3d at 890. HP quotes our explanation that one of the new dependent claims had "the practical effect of expanding the scope of claim 1 to cover claim scope expressly rejected by a previous claim construction ruling." Appellee's Br. 70 (quoting *ArcelorMittal*, 786 F.3d at 890). HP also emphasizes that in *ArcelorMittal*, we held invalid for improper broadening under 35 U.S.C. § 251 not only the newly added claims but also claim 1 itself. Appellee's Br. 70. HP argues that the facts in *ArcelorMittal* are "nearly identical" to this case, and that claim 6 is invalid because claims 15 and 16 have "the practical effect of expanding" the scope of claim 6. *Id.* HP is wrong.

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ArcelorMittal is inapposite. In that case, the patentee had stipulated that all reissued claims, including claim 1, were broader than the original claims. *ArcelorMittal*, 786 F.3d at 890. Thus, in *ArcelorMittal*, there was no dispute that the claims had been broadened. Furthermore, we did not hold, as HP suggests, *see* Appellee’s Br. 70–71, that a dependent claim added during reissue (or reexamination) may broaden and therefore invalidate an unamended, independent claim. To the contrary, we rejected “the argument that a defective reissue application invalidates . . . [the] original claims carried over from the original application.” *ArcelorMittal*, 786 F.3d at 891 (quoting *Hewlett–Packard Co. v. Bausch & Lomb, Inc.*, 882 F.2d 1556, 1566 (Fed. Cir. 1989)).

Accordingly, we affirm the district court’s conclusion that claim 6 and the other asserted claims are not invalid due to improper claim broadening.

CONCLUSION

We have considered the parties’ remaining arguments and find them unpersuasive. For the reasons described above, we affirm-in-part, reverse-in-part, vacate, and remand.

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

COSTS

The parties shall bear their own costs.