

Nos. 18-2338 (Lead), -2339, -2395, -2396

IN THE 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.

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

**PRINCIPAL BRIEF FOR HEWLETT-PACKARD COMPANY
AND HEWLETT PACKARD ENTERPRISE COMPANY**

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INDEPENDENT CLAIM 6 OF U.S. PATENT NO. 6,218,930 B1

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.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

**NETWORK-1 TECHNOLOGIES, INC. V. HEWLETT-PACKARD COMPANY AND HEWLETT
PACKARD ENTERPRISE COMPANY**

Appeal Nos. 18-2338, -2339, 2395, -2396

CERTIFICATE OF INTEREST

Counsel for the Appellees/Cross-Appellants hereby certifies the following:

1. The full name of every party or amicus represented by me is:

HP Inc. f/k/a Hewlett-Packard Company and Hewlett Packard Enterprise Company.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

None.

During the course of this litigation, Hewlett-Packard Company underwent a corporate reorganization in which Hewlett Packard Enterprise Company was spun off as a separate company and the remaining company was renamed Hewlett Packard Inc.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

None.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court (and who have not or will not enter an appearance in this case) are:

Bartlit Beck Herman Palenchar & Scott LLP: Mark E. Ferguson, Mark S. Ouweleen, and Faye E. Paul.

Haltom & Doan: Jennifer Haltom Doan, Joshua R. Thane, Catherine Maness (no longer with Firm), and Kyle R. Akin

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5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal:

Counsel is unaware of any pending case that will directly affect or be directly affected by this Court's decision in the pending appeal and cross-appeal.

Dated: March 29, 2019

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TABLE OF ABBREVIATIONS

Term	Definition
'930 patent	U.S. Patent No. 6,218,930 B1
AIA	Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011)
Akhteruzzaman	U.S. Patent No. 5,754,644
BB	Opening Brief of Network-1 Technologies, Inc.
Chang '885	U.S. Patent No. 5,991,885
Chang Patents	Chang '885 and International Publication No. WO 98/57248
De Nicolo	U.S. Patent No. 6,115,468
Fisher '998	U.S. Patent No. 5,994,998
Fisher Patents	Fisher '998, U.S. Patent No. 6,710,704, and International Application Publication No. WO 98/54843
Fisher Patents Ground	Invalidity ground based on the Fisher Patents, the Chang Patents, and Woodmas
Fisher System Ground	Invalidity ground based on the system developed by David Fisher, the Chang Patents, and Woodmas
IEEE	Institute of Electrical and Electronics Engineers
IPR	Inter partes review
HP	Hewlett-Packard Company and Hewlett Packard Enterprise Company
Lamb	U.S. Patent No. 6,449,348
Lehr '608	U.S. Patent No. 6,473,608
Lehr Patents	Lehr '608, and U.S. Patent Nos. 6,643,566 and 7,466,819
Matsuno	Japanese Unexamined Patent Application Publication No. H10-13576
Network-1	Network-1 Technologies, Inc. (formerly Network-1 Security Solutions, Inc.)
POP	Precedential Opinion Panel
POSITA	Person of ordinary skill in the art
PTAB	Patent Trial and Appeal Board
Smith	U.S. Patent No. 5,982,456
Whittaker	Ron Whittaker, <i>Television Production</i> (1993)
Woodmas	U.S. Patent No. 5,345,592

STATEMENT OF RELATED CASES

Pursuant to Fed. Cir. R. 47.5(a), counsel for Hewlett-Packard Company and Hewlett Packard Enterprise Company state that no other appeal in or from the same case in the district court was previously before this or any other appellate court.

Pursuant to Fed. Cir. R. 47.5(b), counsel are not aware of any other cases pending in this or any other court or agency that will directly affect or be directly affected by this Court's decision in the pending appeal.

The judgment should be affirmed as to non-infringement, but reversed as to invalidity.¹

INTRODUCTION

The accused HP devices do not infringe the asserted claims, as the jury found. Although Network-1 challenges the construction of two claim terms, the trial record compels a finding of non-infringement irrespective of those constructions—which are, in any event, correct in light of the intrinsic and extrinsic evidence. Accordingly, the judgment of non-infringement should be affirmed.

The asserted claims are invalid as obvious over a prior-art combination, as the jury also found. The district court set aside that verdict, concluding that HP was estopped from asserting this ground of invalidity by a separate administrative proceeding. That conclusion was erroneous because HP neither raised nor reasonably could have raised in that proceeding the combination on which the jury relied. Accordingly, the judgment of no invalidity should be reversed.

¹ In November 2015, Hewlett-Packard Company and Hewlett Packard Enterprise Company became separate companies (Appx4131(87:11-15)); but “as far as this lawsuit’s concerned,” they are “all one Defendant.” Appx4132(88:1-5). We will refer to them collectively as “HP.” In addition, during this litigation, the patentee changed its name from “Network-1 Security Solutions, Inc.” to “Network-1 Technologies, Inc.” Appx231(Dkt. Nos. 422, 423). We will refer to this entity as “Network-1.”

STATEMENT OF JURISDICTION

The district court, which had jurisdiction under 28 U.S.C. § 1338(a), entered final judgment on August 29, 2018. Appx140. After Network-1 filed a timely notice of appeal on August 30, 2018, HP filed a timely notice of cross-appeal on September 13, 2018. Appx5380-5383. This Court has jurisdiction under 28 U.S.C. § 1295(a)(1).

STATEMENT OF THE ISSUES

I. Network-1's Appeal

A. Independent Basis for Verdict: Does the evidence compel a finding of non-infringement irrespective of the challenged constructions?

B. Claim Construction:

1. Did the district court properly construe “low level current” to mean “a non-data-signal current that is sufficient to begin the start up of the access device but that is not sufficient to sustain the start up”?

2. Did the district court properly construe “main power source” to mean “a DC power source”?

II. HP's Cross-Appeal

A. IPR Estoppel: Did the district court err in concluding that HP is estopped from presenting its obviousness challenge to all the asserted claims?

B. Claim Broadening: Are the asserted claims invalid as a result of Network-1's improper claim broadening during reexamination?

COUNTER-STATEMENT OF THE CASE

The jury found that the accused HP switches do not infringe the asserted claims of the '930 patent and further found that the asserted claims are invalid as obvious over the prior art. Appx70-71. On post-trial motions, the district court sustained the jury's verdict of non-infringement, but entered judgment of no invalidity on the basis of estoppel. Appx74-139.

I. Factual Background.

Electronic devices are often powered using wall outlets or other components located close to the device. But for some network access devices, *e.g.*, wireless access points or some types of phones, power is remotely delivered through the Ethernet cables that the network devices use to communicate data. *See* Appx330(1:13-15). Not all access devices can accept remote power via the Ethernet cable, and so modern network systems must be able to determine whether a particular access device is capable of doing so (using what are called "detection methods"). Detection methods existed years before the '930 patent's filing date. Appx2199-2200(16:3-17:7).

A. The '930 Patent.

The '930 patent discloses one particular detection method. In Figure 1 (below), the '930 specification shows “a simplified schematic diagram of the remote power automatic detection system of the present invention.” Appx330(2:20-21). This includes remote access equipment 10, which “includes an internal dc-dc switching supply which, in the absence of the present invention, would be supplied by an ac transformer adapter plugged in to the local 110 volt supply.” Appx330(2:40-44).

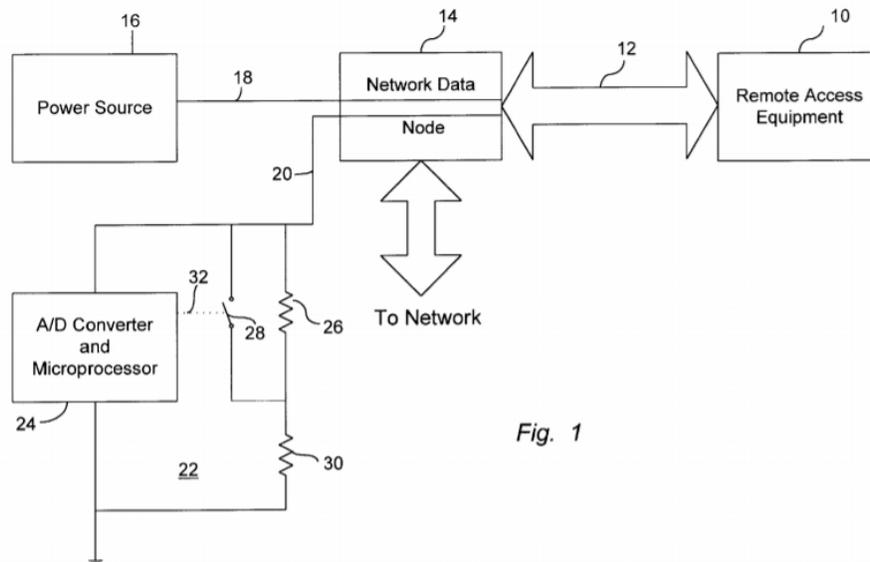


Fig. 1

Appx327. The '930 patent's remaining figures, Figures 2 and 3, show aspects of the same “present invention” that is shown in Figure 1. Appx331(3:28-31, 3:59-60).

In accordance with “the present invention” of the '930 patent, a power source 16 “suppl[ies] a power level sensing potential to the remote access equipment 10 over one of the cable conductors.” Appx330(2:52-57). “Automatic detection of remote equipment being connected to the network,” the '930 specification continues,

is “accomplished by delivering a low level current (approx. 20 ma) to the network interface and measuring a voltage drop in the return path.” Appx330-331(2:66-3:2). That voltage drop can be measured as one of “three states”: “no voltage drop, a fixed level voltage drop or a varying level voltage drop.” Appx331(3:2-4). If either of the first two states is detected, remote access equipment 10 is determined not to be able to accept remote power. Appx331(3:4-11). But:

If a varying voltage level is detected, this identifies the presence of dc-dc switching supply in the remote equipment. The 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. This cycle continues to be repeated creating a “sawtooth” voltage level in the return path.

Appx331(3:12-17). The ’930 specification does not state or otherwise indicate that any other detection method could be used. This is the sole detection method the ’930 patent describes in its three-column specification.

The ’930 patent issued on April 17, 2001 with claims 1-9, of which claims 1 and 6 are independent. Appx331-332(4:10-6:5). In the first reexamination (of two) of the ’930 patent, Network-1 added claims 10-23, of which claims 20-23 are independent. Appx334-335. At trial, Network-1 asserted independent claims 6, 20, and 22, and dependent claims 13, 14, and 17 (collectively, the “asserted claims”). Appx70.

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 Network-1 improperly broadened claim 6 based on the term “secondary power source.” Independent claim 6 includes all of these terms and is reproduced in full below:

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.

Appx331(4:50-67).

B. The IEEE Adopts the “Resistor Method” in the 802.3af Standard.

In commercial “Power-over-Ethernet” (“PoE”) systems, an access device is powered through the Ethernet cables that the device uses to communicate data. The Institute of Electrical and Electronics Engineers (“IEEE”) developed the 802.3af industry standard, which specifies protocols for PoE. Appx2131(103:9-22). At trial,

the jury heard from David Dwelley, a third-party witness (Appx2120-2121(92:16-93:10)) who was a member of the IEEE's working group (Appx2129(101:9-14)) and who helped design the PoE chips that go into the accused devices (Appx2125-2126(97:7-98:19), Appx2136(108:7-14)). Mr. Dwelley explained that the "resistor method" was selected as the 802.3af standard's detection method. Appx2132(104:12-18). As a result, all industry standard PoE devices, including all of the accused products in this case, use that method.

In the resistor method, specific "detection currents" are delivered to the access device, and resulting voltages are measured to determine if the access device contains a "signature resistor" (*i.e.*, one having about 25 kilo-ohm of resistance). Appx2141-2142(113:24-114:3). In an access device using the resistor method, the device is "passive" during the detection process. Appx2143(115:14-25).

Although the IEEE 802.3af working group was aware of the '930 patent (*see, e.g.*, Appx2165(137:3-17)), the '930 patent's "active" detection method was not incorporated into the standard. Network-1 cites an email describing a conversation with an individual "from PowerDsine," who expressed a concern from certain unnamed customers regarding the '930 patent. BB at 11-12. But Network-1 leaves out that while PowerDsine's proposed detection method "was considered [] a lot like the '930 patent," the IEEE working group never even put the PowerDsine proposal to a vote. Appx2178-2180(150:14-152:18). That detection method was, as Mr.

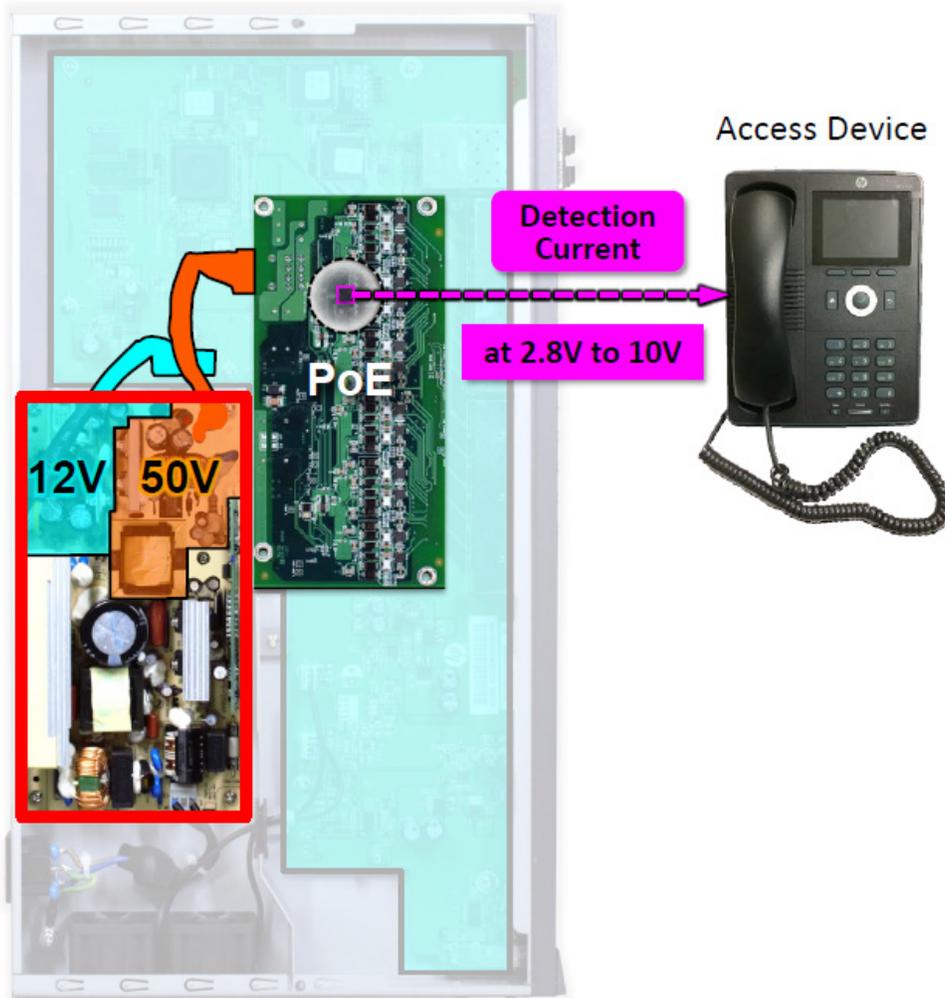
Dwelley further testified, deemed “insufficiently selective,” *i.e.*, it was not able to correctly detect whether an access device can accept PoE. Appx2179-2180(151:13-152:14).

C. The Accused PoE+ Switches.

As explained at trial by David Tremblay, an HP system architect with detailed knowledge of HP’s networking products, HP has made “traditional” non-PoE Ethernet switches for over two decades. Appx2058(30:11-15). These traditional switches contain a “power supply board” that delivers 12-volt power to the switch’s “Ethernet switchboard.” Appx2056(28:7-21). The Ethernet switchboard “contains all the Ethernet switching, brains and components in order to allow the Ethernet switch to operate as it’s intended to” (Appx2056(28:13-15)).

More recently, HP has developed “PoE+” switches, illustrated in the trial demonstrative reproduced below. These PoE+ switches added Power over Ethernet functionality to the existing basic configuration of traditional Ethernet switches. Like their non-PoE predecessors, the PoE+ switches include an Ethernet switchboard and 12-volt power source as found in traditional switches (both highlighted in teal). Network-1 asserts that this Ethernet switchboard meets the “data node” limitation of the claims. Appx2057-2058(29:24-30:10); Appx2059(31:2-7). But the accused PoE+ switches also include a PoE board and a separate higher voltage power source (the latter highlighted in orange) that is electrically isolated from the 12-volt

power source. Appx2059(31:8-13). The PoE board includes PoE chips that deliver detection currents to the access device. See Appx2060(32:4-16); Appx2233(50:3-13).



The PoE chips used in these devices are themselves designed to be standard compliant, and are supplied by a number of semiconductor manufacturers, including Linear Technology Corp. As explained by Mr. Dwelley—who worked at Linear Technology for over 28 years (Appx2122(94:2-4)) and helped develop the first two

generations of these chips (Appx2136-2137(108:21-109:9))—these PoE chips control “detection, classification, turn-on and turn-off of power, and the maintenance of power.” Appx2139(111:9-14). The accused PoE+ switches all are compatible with the IEEE 802.3af standard (Appx2040(12:10-12)) and, as such, implement the “resistor method” for determining whether the access device can accept PoE. *See* Appx2141-2142(113:24-114:3).

II. Procedural History.

A. Previous Assertions of the '930 Patent.

D-Link. Network-1 sued D-Link in August 2005. *See Network-1 Security Solutions, Inc. v. D-Link Corp.*, No. 6:05-cv-00291-LED (E.D. Tex. Aug. 10, 2005). The district court construed “low level current” to have an upper bound and a lower bound: “a current sufficient to cause the access device to start up, but not sufficient to sustain the start up” (Appx5475-5476) and held that “the secondary power source is physically separate from the main power source” (Appx5473-5474). The court did not construe “main power source.” The *D-Link* case settled in August 2007. Appx5465-5466.

Cisco. In February 2008, Network-1 sued Cisco and others. *See Network-1 Security Solutions, Inc. v. Cisco Systems, Inc.*, No. 6:08-cv-00030 (E.D. Tex. Feb. 7, 2008). The district court again construed “low level current” as “a current sufficient to cause the access device to start up, but not sufficient to sustain the start up.”

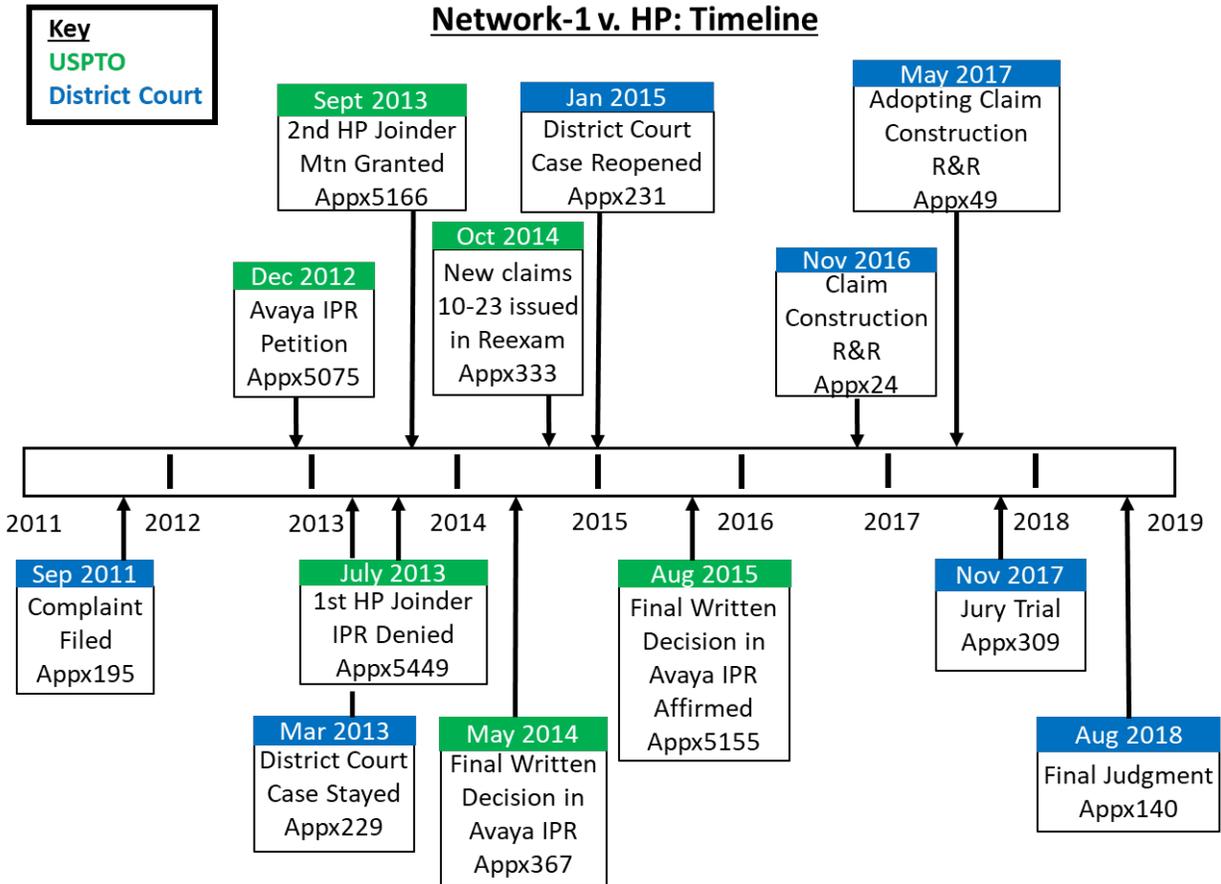
Appx354. In reaching that conclusion, the district court reasoned that “Network-1 agrees” that “low level current” is a “relative term of degree, so some objective guidance must be provided by the specification.” Appx354. The district court further reasoned that the “only objective benchmark to guide one skilled in the art is a varying voltage level produced in the return path when the access device is beginning to start up, but is unable to sustain start up.” Appx354.

The *Cisco* court construed the term “main power source” as “a DC power source.” Appx348. The court rejected Network-1’s “attempts to construe the term broadly to include an AC electrical outlet as a ‘main power source,’” reasoning instead that “a construction of such a breadth is inconsistent with the specification.” Appx347. The court also construed “secondary power source” as “a source of power connected to provide power between the data node and the access device using the data signaling pair. The secondary power source is physically separate from the main power source.” Appx352. Finally, the court invalidated independent claim 1 (and, by implication, invalidated dependent claims 2-5) for indefiniteness (Appx360-361), a ruling Network-1 did not appeal.

B. The Current Assertion of the '930 Patent Against HP.

“This case,” the district court observed, “has a long, tortured history.” Appx75. The timeline below summarizes the relevant events between Network-1

filing its complaint against HP and numerous other defendants in September 2011 and entry of final judgment in August 2018.



1. Claim Construction.

Construction of “Low Level Current.” The magistrate judge rejected Network-1’s argument that there should be no lower bound in the construction of the term “low level current,” reasoning instead that a lower boundary was “appropriate to give meaning to the constituent term ‘low.’” Appx34. The magistrate judge did modify the *Cisco* construction such that “current must be sufficient to ‘begin start up’ rather than ‘cause start up,’ thus eliminating any implication that the current

must be sufficient to result in a completed start-up.” Appx34. Accordingly, the magistrate judge 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.” Appx35.

The district court overruled Network-1’s objection that this construction improperly limits the term to a preferred embodiment because “[a]s the Report notes, the *D-Link* and *Cisco* courts ruled that the patentee used the phrase ‘low level’ to have a particular meaning in the context of the patent-in-suit and the relevant art.” Appx54. The district court also rejected Network-1’s reliance on IPR proceedings because Network-1 did not “account for the broader claim construction standard” applied there. Appx54-55.

Construction of “Main Power Source.” The magistrate judge reasoned that construction of “main power source” as “a DC power source” was “reinforced by the specification” and the “explanation of Defendants’ expert” Dr. Dean P. Neikirk. Appx30. In particular, the magistrate judge credited Dr. Neikirk’s testimony that “if the ‘main power source’ was providing AC current, the ‘system would be inconsistent with the teachings of the ’930 patent.” Appx31 (quoting Appx1050(¶37)). The magistrate judge further rejected Network-1’s “reliance on [IPR] proceedings” because Network-1 did not “account for the broader claim construction standard applied in IPR.” Appx31. The magistrate judge also rejected Network-1’s citations to

“a prior art patent or a dictionary definition” because “the ’930 Patent uses the term ‘main power source’ in a specific context and should be construed within that context.” Appx31.

The district court overruled Network-1’s objection that a “construction excluding AC power sources is unsupported by the claim language, specification, or prosecution history,” reasoning instead that the magistrate judge’s construction was supported by Dr. Neikirk’s opinion that “if the ‘main power source’ provided AC current, it would be unable to detect the second state, a fixed voltage drop.” Appx50. The district court further rejected Network-1’s argument that its proposal would encompass both AC and DC power sources because that “argument fails to address the crux of the Magistrate Judge’s finding that such a construction would be inconsistent with the specification.” Appx51. The district court emphasized that Network-1 had not “presented evidence to counter Defendants’ evidence, cited in the Report, that it is not feasible to detect a fixed voltage drop in the presence of an AC current.” Appx51.

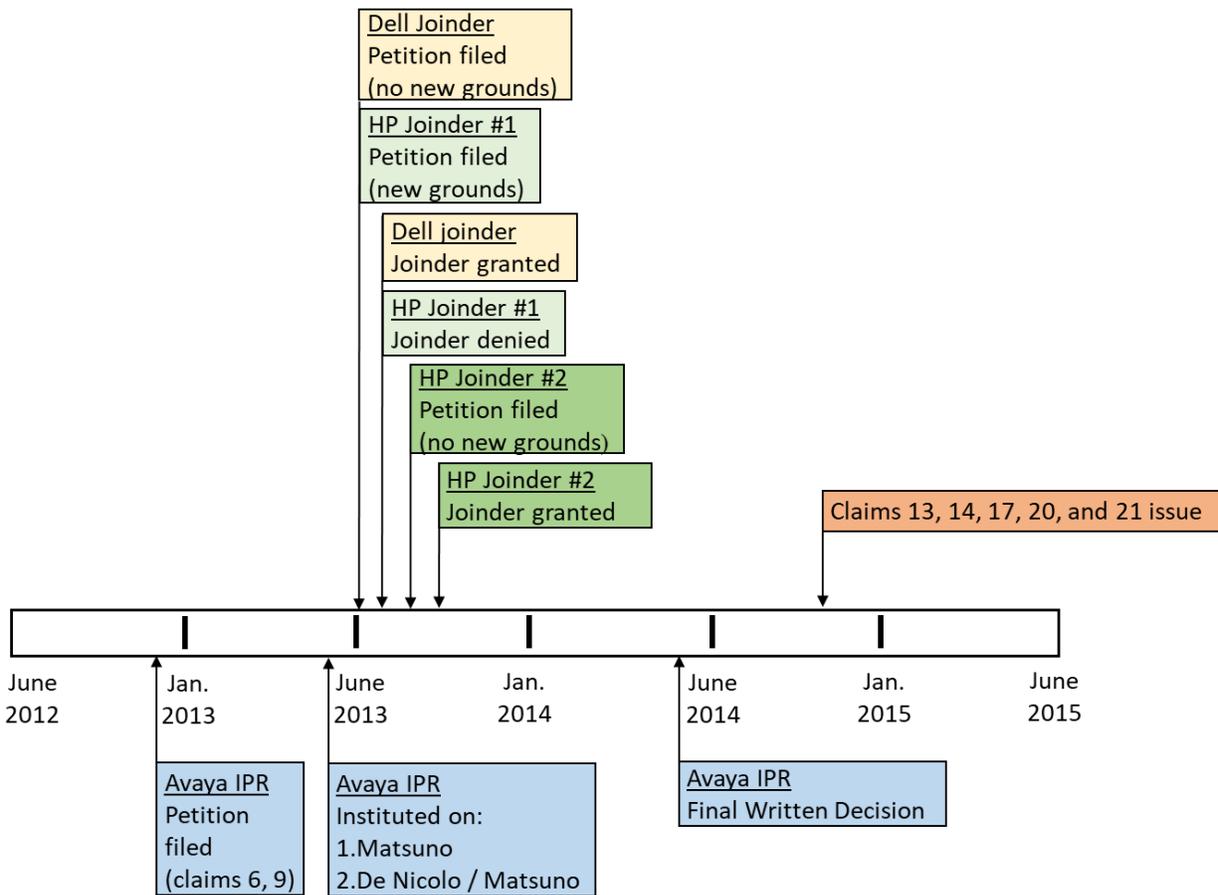
Construction of “Secondary Power Source.” The district court construed “secondary power source,” as recited in claim 6, as “a source of power connected to provide power between the data node and the access device using the data signaling pair; the driving points of the secondary power source must be *physically separate* from the driving points of the main power source.” Appx52 (emphasis added); *see*

also Appx32-33. In reaching this construction, the district court rejected Network-1’s argument that the main power source and the secondary power source can be one and the same. Appx53. The district court’s construction is consistent with how the *D-Link* and *Cisco* courts construed this term. Appx5474; Appx352. Network-1 has not challenged that construction on appeal.

2. Post-Grant Challenges to the '930 Patent.

Of relevance to HP’s cross-appeal are several inter partes review (“IPR”) proceedings, which are summarized below.

'930 Patent Post-Grant Challenges: Timeline



In December 2012, when IPR proceedings were in their infancy, Avaya filed an IPR petition challenging claims 6 and 9 of the '930 patent based on Japanese Unexamined Patent Application Publication No. H10-13576 (“Matsuno”), U.S. Patent No. 5,754,644 (“Akhteruzzaman”), U.S. Patent No. 5,991,885 (“Chang '885”), and U.S. Patent No. 6,115,468 (“De Nicolo”). Appx5089-5090. The Patent Trial and Appeal Board (“PTAB”) instituted review on some but not all grounds in Avaya’s IPR Petition. *See* Appx5090 (listing petitioned grounds); Appx373 (listing instituted grounds). Sony and others also filed an IPR petition, challenging claims 6, 8, and 9 of the '930 patent, but the PTAB denied institution on Sony’s IPR petition. Appx5411.

<i>Avaya Petition – Summary of Grounds</i>				
No.	Statutory Basis	Reference(s)	Claims	Instituted?
1	§ 102(b)	Matsuno	6 & 9	Yes
2	§ 103(a)	De Nicolo & Matsuno	6 & 9	Yes
3	§ 102(a)	Akhteruzzaman	6 & 9	No
4	§ 103(a)	De Nicolo & Akhteruzzaman	6 & 9	No
5	§ 103(a)	Chang '885 & De Nicolo	6 & 9	No

After the one-year bar set forth in 35 U.S.C. § 315(b) had expired, Dell filed an IPR petition and motion for joinder presenting the same grounds as those instituted upon in the Avaya IPR. Appx5433-5446 (decision granting joinder). The PTAB permitted Dell’s joinder. Appx5442; *see also* Appx5431. HP and others also filed an IPR petition and motion for joinder, presenting grounds different from those instituted in the Avaya IPR: U.S. Patent No. 5,345,592 (“Woodmas”), U.S. Patent

No. 5,982,456 (“Smith”), Ron Whittaker, *Television Production* (1993) (“Whittaker”), U.S. Patent No. 6,473,608 (“Lehr”), and U.S. Patent No. 6,449,348 (“Lamb”). Appx5450-5451.

<i>First HP Joinder IPR Petition – Summary of Grounds</i>				
No.	Statutory Basis	References	Claims	Instituted?
1	§ 103(a)	Woodmas, Smith, & Whittaker	6, 8, & 9	No
2	§ 103(a)	Lehr & Woodmas	6, 8, & 9	No
3	§ 102(b)	Matsuno	6, 8, & 9	No
4	§ 102(b)	Lamb & Matsuno	6, 8, & 9	No

The PTAB denied this joinder motion. Appx5463; *see also* Appx5452. HP and others then filed another IPR petition and corresponding joinder motion presenting the same grounds as those instituted in the Avaya IPR. Appx5167-5168. This time, the PTAB permitted joinder with the Avaya IPR. Appx5180.

In its final written decision, the Board held that challenged claims 6 and 9 were not shown to be unpatentable over the references on which review had been instituted. Appx398. This Court summarily affirmed. *Avaya Inc. v. Network-1 Techs., Inc.*, 612 F. App’x 613, 614 (Fed. Cir. 2015) (non-precedential).

3. Reexamination.

The ’930 patent was reexamined twice before the USPTO. The first reexamination was assigned Control No. 90/012,401 (“the ’401 Reexamination”) and concluded with a reexamination certificate being issued on October 14, 2014—after the final written decision in the Avaya IPR and after the claim construction orders were

issued in *D-Link* and *Cisco*. Appx333; Appx363; Appx5483. The reexamination certificate indicated that the patentability of claims 6, 8, and 9 had been confirmed and claims 10-23 had been added. Appx334. Of particular relevance here are new claims 15 and 16, which depend from original claim 6. Both do away with the “physically separate” requirement required by the *D-Link* court, the *Cisco* court, and the district court here—claim 15 recites “wherein said secondary power source is the same source of power as said main power source” (Appx334(1:39-41)), while claim 16 recites “wherein said secondary power source is the same physical device as the main power source” (Appx334(1:42-44)).

The second reexamination was assigned Control No. 90/013,444 and concluded with a reexamination certificate being issued on November 9, 2015. Appx336. This reexamination certificate indicated that the patentability of claims 6 and 8-23 had been confirmed. Appx337.

4. Summary Judgment Motion On Claim Broadening.

HP moved for summary judgment that claims 6, 21, 23, and others are invalid under 35 U.S.C. § 305 as having been impermissibly broadened on reexamination. *See* Appx40-46. The district court invalidated claims 21 and 23. Appx1165-1171; Appx46; Appx56; Appx5521-5523. But the magistrate judge recommended denying HP’s motion as to claim 6 (Appx40-42), and the district court overruled HP’s objections to the recommendation (Appx57-59).

5. Summary Judgment Motion On Estoppel.

Network-1 moved for summary judgment that HP should be estopped from raising the following obviousness combinations at trial: (1) the Lehr Patents (Lehr '608 and U.S. Patent Nos. 6,643,566 and 7,466,819) in view of Woodmas and the Chang Patents; and (2) U.S. Patent No. 6,246,748 in view of Woodmas. Appx5622. The district court granted Network-1's partial summary judgment motion with respect to these two combinations. Appx5622.

6. Trial.

At trial, HP adduced evidence that the accused PoE+ switches do not infringe the asserted claims of the '930 patent at least because the accused devices do not deliver the alleged "low level current" (*i.e.*, the detection current) "from said main power source" to the "access device" (*see* Appx2233(50:8-13); Appx2195(12:21-23)), and because the detection current is not a "low level current" in any event (*see* Appx2195(12:18-20)).

HP also presented evidence that the asserted claims would have been obvious based on (1) the combination of the system developed by David Fisher, the "Chang Patents" (Chang '885 and International Publication No. WO 98/57248), and Woodmas (collectively, the "Fisher System Ground") and (2) the combination of the

“Fisher Patents” (Fisher ’998, U.S. Patent No. 6,710,704, and International Application Publication No. WO 98/54843), the Chang Patents, and Woodmas (collectively, the “Fisher Patents Ground”). Appx2356(34:2-6); Appx2349(27:16-21).

After being instructed (Appx5184-5219), the jury was given a general verdict form that asked whether the accused HP devices infringed the asserted claims and whether those claims were invalid. Appx70-71. The jury found the asserted claims both not infringed and invalid. Appx70-71.

7. Post-Trial Motions.

Following the jury’s verdict of non-infringement and invalidity, Network-1 moved for a new trial on infringement and judgment as a matter of law (“JMOL”) on invalidity. Appx74. The district court rejected Network-1’s new-trial arguments and upheld the jury’s non-infringement verdict. Appx95; Appx97.

But the district court granted Network-1’s JMOL motion for judgment as a matter of law on validity. The court first concluded that the Fisher System did not constitute prior art. Appx87. The district court further held that HP was estopped from presenting the Fisher Patents Ground, even though the prior art comprising that ground was not before the PTAB in the IPR that HP joined. Appx91. The court reasoned 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.” Appx91.

SUMMARY OF ARGUMENT

I. Network-1's Appeal

A. The verdict of non-infringement is supported by conclusive evidence irrespective of the correctness of the constructions challenged by Network-1. At trial, HP established that every accused PoE+ switch delivers detection currents (the only alleged “low level current”) from a PoE chip—which is not a main power source—and thus proved that no accused PoE+ switch meets the claim requirement of “delivering low level current from said main power source.”

The record contains no evidence from which the jury reasonably could have concluded otherwise, and this non-infringement argument stands independent of the claim constructions challenged on appeal. In its opening brief, Network-1 ignores this point entirely, and therefore has forfeited its ability to contest the verdict of non-infringement.

B. The challenged claim constructions are in any event correct.

1. Recognizing that the '930 specification—not plain meaning—controls, the district court properly construed “low level current” to require both the “upper” and “lower” bounds set forth in the '930 specification: “a non-data-signal current that is sufficient to begin the start up of the access device but that is not sufficient to sustain the start up.” Appx53-56. Network-1 takes issue with only the lower bound, but the upper and lower bounds are equally important to the purported invention of the '930

patent. Indeed, the '930 specification requires that the "low level current" be subject to the lower bound recited in the district court's construction. And the evidence at trial compels a finding of non-infringement under that construction.

2. The district court construed "main power source" as "a DC power source." The district court's construction is rooted in the '930 specification and the declaration testimony of HP's expert Dr. Neikirk, who explained that a "main power source" outputting AC power would be inconsistent with the '930 specification. Network-1 did not offer opposing testimony and does not dispute Dr. Neikirk's testimony on appeal. In any event, the construction of "main power source" is irrelevant to the jury's verdict of non-infringement.

II. HP's Cross-Appeal

A. Although the jury correctly found that the patent would have been obvious in light of the prior art presented at trial, the district court held that HP was estopped from relying on this prior art by joining an IPR that challenged the validity of the '930 patent on different grounds.

1. The district court erroneously concluded that HP "reasonably could have raised" the invalidity ground before the PTAB. After instituting review on a limited number of grounds, the PTAB exercised its discretion not to institute on any other grounds. Indeed, the PTAB rejected HP's efforts to raise additional grounds without reaching the substance of those grounds.

2. The district court further erred by holding that HP could be estopped as to claims that were not challenged in the IPR (and, indeed, that issued after the PTAB’s final written decision). The statute explicitly states that estoppel applies to a “claim” challenged in IPR, and thus any estoppel must be limited to claim 6.

3. Network-1 waived any argument challenging the sufficiency of the evidence supporting the jury’s finding that the prior art renders the asserted claims obvious. In any event, HP presented substantial evidence supporting the jury’s obviousness finding. HP’s expert Dr. Neikirk explained in detail that the combination of prior art meets every limitation of the asserted claims and that a person of ordinary skill in the art would have had ample motivation to combine the references.

B. During reexamination of the ’930 patent, Network-1 added new dependent claims that broadened original independent claim 6, as construed. Under 35 U.S.C. § 305, this impermissible claim broadening renders the asserted claims invalid.

STANDARDS OF REVIEW

“The Federal Circuit reviews decisions on motions for JMOL, motions for a new trial, and evidentiary rulings under the law of the regional circuit.” *SSL Servs., LLC v. Citrix Sys., Inc.*, 769 F.3d 1073, 1082 (Fed. Cir. 2014).

With respect to Network-1’s appeal, in the Fifth Circuit a motion for new trial “invokes the sound discretion of the trial court, and appellate review of its ruling is

quite limited.” *Sibley v. Lemaire*, 184 F.3d 481, 487 (5th Cir. 1999); *see also SSL*, 769 F.3d at 1082 (“The Fifth Circuit reviews the denial of a new trial for an abuse of discretion”). “Claim construction is ultimately a question of law” that this Court reviews de novo, and any “subsidiary factual findings based on extrinsic evidence ‘must be reviewed for clear error on appeal.’” *Cont’l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 795 (Fed. Cir. 2019) (quoting *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015)).

With respect to HP’s cross-appeal, 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., Inc.*, 230 F.3d 828, 830 (5th Cir. 2000)). In the Fifth Circuit, the “jury may only be reversed if there is no substantial evidence supporting the verdict.” *Versata Software, Inc. v. SAP Am., Inc.*, 717 F.3d 1255, 1261 (Fed. Cir. 2013). “Substantial evidence ... means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.” *Consol. Edison Co. of N.Y. v. N.L.R.B.*, 305 U.S. 197, 229 (1938). “Whether amendments made during reexamination enlarge the scope of a claim is a matter of claim construction, which this court reviews de novo.” *Creo Prods., Inc. v. Presstek, Inc.*, 305 F.3d 1337, 1344 (Fed. Cir. 2002).

ARGUMENT

I. The Accused Devices Do Not Infringe (Response to Network-1's Appeal).

Network-1 argues that this Court should overturn the jury's non-infringement verdict if "the district court's construction of either 'low level current' or 'main power source' is erroneous." BB at 22. But the record evidence compels a non-infringement finding independently of both constructions, so the Court should affirm without reaching those constructions—which are, in any event, correct.

A. The Verdict Of Non-Infringement Has An Independent Basis.

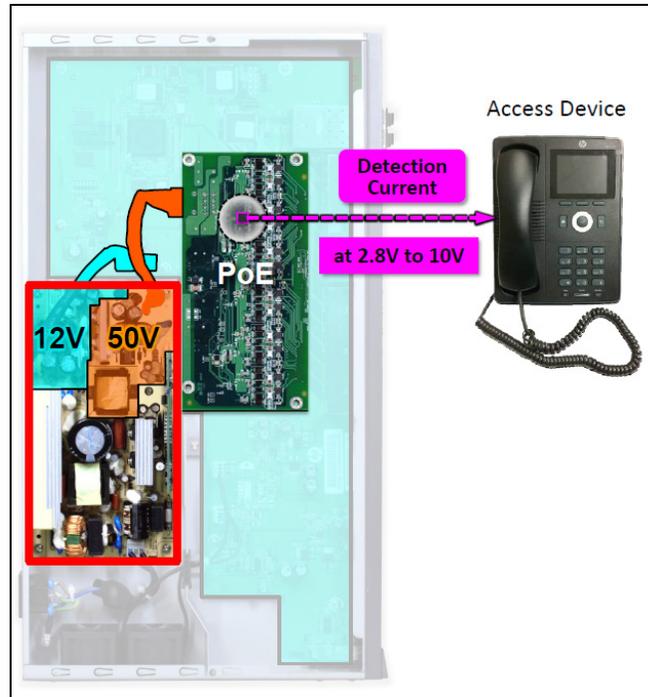
As the party seeking to disturb the non-infringement judgment, Network-1 "must establish that [the challenged jury] instructions were legally erroneous, and that the errors had prejudicial effect." *SSL*, 769 F.3d at 1085 (quoting *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1373 (Fed. Cir. 2002)). To warrant a new trial, the challenged "jury instruction [must have been] in fact prejudicial. When the [alleged] error in a jury instruction could not have changed the result, the [allegedly] erroneous instruction is harmless." *CytoLogix Corp. v. Ventana Med. Sys., Inc.*, 424 F.3d 1168, 1174 (Fed. Cir. 2005).

Here, the challenged instructions (the constructions of "low-level current" and "main power source") would not have changed the result and Network-1 cannot meet its burden to show prejudicial error. At trial, HP presented conclusive evidence that no accused product meets the claim language "*delivering a low level current from*

said main power source,” a requirement of every asserted claim. Appx331(4:60-62) (claim 6) (emphases added); *see also* Appx334(1:66-67) (claim 20); Appx334(2:38-43) (claim 22). This evidence warrants affirmance of the non-infringement judgment irrespective of the claim constructions challenged by Network-1 on appeal.

1. At trial, HP established that its products never practice the claim requirement “*delivering* a low level current *from* said main power source.” In brief, HP’s products never deliver detection current (the alleged “low level current”) from a “main power source,” but instead deliver detection current from a PoE chip. Network-1 does not dispute that a PoE chip is not a “main power source.” *See, e.g.*, Appx1966(43:4-11) (Network-1’s counsel asking whether “the current comes from the [PoE] chip or from the main power supply”).

David Tremblay, HP’s resident expert on PoE, testified that detection currents (the pink arrow in the figure below) are delivered “*from* the Power-over-Ethernet chips” (labeled “PoE” below), not from the 12V power supply (green box) or the 50V power supply (orange box). Appx2059-2060(31:25-32:16); *see also* Appx2091(63:1-7) (same); Appx2115(87:14-17) (testifying that the PoE chips are “where the detection voltages originate from”).



David Dwelley spent almost 29 years designing PoE chips that go into HP’s switches. Appx2122(94:2-7, 94:13-19); Appx2126(98:2-4). He testified that detection currents are “generated inside” the PoE chip. Appx2139-2140(111:20-112:13); Appx2156(128:13-20). And HP’s non-infringement expert, Dr. Nathaniel Davis, testified that the PoE chips are what “deliver[] the detection current[.]” Appx2233(50:8-13); *see also* Appx2233(50:16-20). Dr. Davis further explained that neither the 50V power supply (orange box in the figure above) nor the 12V power supply (green box) delivers the detection current. Appx2241-2242(58:18-59:9). Thus, three separate witnesses testified that the PoE chip—not a “main power source”—generates and delivers detection current in HP’s products. Each witness’s

testimony independently supports a finding that no HP product meets the claim requirement “delivering a low level current from said main power source,” and thus no HP product infringes.

Although Network-1 bore the burden of proving infringement, it failed to present any evidence at trial from which the jury could find that any HP device “*deliver[s] a low level current from said main power source.*” See Appx2629(120:16-24) (in closing argument, challenging Network-1 to present any evidence on this claim requirement). Even after HP put this issue front and center in post-trial briefing (Appx5224), Network-1 still could not identify any evidence showing that any HP device delivers detection current from the “main power source” (Appx5033-5036). And Network-1’s appeal brief likewise fails to identify any such evidence, nor does it even acknowledge this dispute.

Given three chances, Network-1 has consistently failed to identify any evidence from which the jury could find that HP’s switches “deliver” detection current “from the main power source.” The jurors only had HP’s evidence establishing that HP’s switches never “deliver” detection current “from the main power source.” This evidence compels a finding of non-infringement.

This non-infringement finding is independent of the claim constructions of “low level current” and “main power source.” Should the Court modify the con-

struction of “low level current,” the evidence still compels a conclusion of non-infringement. The only alleged “low level current” is HP’s detection current. *See* BB at 4, 67-68; Appx1732(121:17-19) (Network-1’s expert alleging “the detection current” is the “low level current”). And the record shows HP’s detection current is delivered from a PoE chip (Appx2059-2060(31:25-32:16); Appx2139-2140(111:20-112:13); Appx2233(50:8-13)), which is not a “main power source” (Appx1966(43:4-11)). Similarly, should the Court hold that the “main power source” can be *any* power source, even an AC power source (as Network-1 urges), non-infringement is still the necessary result. As noted, HP’s detection current is delivered from a PoE chip, which is not an AC power source, DC power source, or any other power source that might qualify as the “main power source” of the claims.

Therefore, the Court should affirm the district court’s non-infringement judgment without reaching Network-1’s claim construction arguments because the claim constructions Network-1 urges “could not have changed the result.” *CytoLogix*, 424 F.3d at 1174.

2. Network-1 represents to this Court that “[t]he only two elements that HP contested at trial were ‘low level current’ and ‘main power source.’” BB at 67. As demonstrated above, that is simply false. None of the materials Network-1 string-cites (BB at 67) shows that HP challenged only two claim elements. In fact, one of Network-1’s citations (Appx2195) shows the opposite. There, Dr. Davis testified

that HP’s “detection currents are not *delivered from* the main power source that also supplies power to the data node.” Appx2195(12:21-23). This and a substantial body of additional evidence allowed the jury to determine that the accused devices do not infringe regardless of how “low level current” and “main power source” are defined. Network-1 on appeal tries to re-characterize the dispute, and in so doing ignores the “delivering ... from” limitation in its entirety.

In asserting prejudice, Network-1 also argues it could have shown that “an AC power source *supplies power* for the two recited functions of powering the data node and the low level detection current.” BB at 69 (emphasis added). But supplying power for the detection current, whatever Network-1 intends that to mean, is not the same as “*delivering* a low level current *from* said main power source”—which is what the claims require. As explained above, HP’s switches do not meet this claim limitation, which Network-1 simply ignores in its principal brief.

Finally, Network-1’s reliance (BB at 66-70) on this Court’s decisions in *SSL*, 769 F.3d at 1085, *Avid Technology, Inc. v. Harmonic, Inc.*, 812 F.3d 1040 (Fed. Cir. 2016), and *Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc.*, 381 F.3d 1371, 1383 (Fed. Cir. 2004), is misplaced. Each decision warrants affirmance, not reversal, of the district court’s non-infringement judgment.

In *SSL*, the court *affirmed* the district court’s denial of a new infringement trial, concluding that “even if the district court erred in its construction of the other

challenged limitations, the result the jury reached—the finding of non-infringement—would not change.” 769 F.3d at 1084. In affirming, the *SSL* Court reasoned that “there is no evidence in the record from which a good faith argument can be made that the [accused products’] identifiers are ‘network addresses’ as that term was construed by the district court.” *Id.* Similarly, here, even if the Court were to modify the constructions of “low level current” and “main power source,” the verdict of non-infringement would stand because Network-1 failed to controvert, at trial or on appeal, HP’s showing that the detection current in the accused devices is not delivered “from” a main power source.

In *Avid*, the court ordered a new trial because the defendant did not “argue[] that the evidence compels a finding of non-infringement independently of the construction error.” 812 F.3d at 1042. Network-1 simply ignores this point, which was central to the *Avid* court’s holding. Unlike the *Avid* defendant, HP has demonstrated that the evidence compels a finding of non-infringement independent of the constructions of “main power source” and “low level current.” Thus, “a reasonable jury would have been required by the evidence to find non-infringement” regardless of the alleged errors in claim construction. *Id.* at 1047.

In *Cardiac Pacemakers*, the court ordered a new trial after modifying the one claim construction that supported defendant’s sole non-infringement argument. 381 F.3d at 1383-84. Here, by contrast, HP established non-infringement based on claim

language, “delivering ... from,” that is unaffected by the claim construction issues on appeal.

3. In its principal brief, Network-1 does not argue that the jury could reasonably have found that HP’s switches meet the “delivering ... from” limitation of the claims. Network-1 has therefore forfeited the issue. *SSL*, 769 F.3d at 1085; *SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1319 (Fed. Cir. 2006) (“Our law is well established that arguments not raised in the opening brief are waived”). Because the “delivering ... from” limitation is recited in each asserted claim, Network-1’s forfeiture means it cannot establish on appeal that any claim construction it challenges “could have changed the verdict.” *SSL*, 769 F.3d at 1085. This provides an independent basis for affirming the district court’s judgment of non-infringement.

Network-1 should not be permitted to address the “delivering ... from” limitation for the first time in its reply brief in this Court. But in case Network-1 attempts to do so, HP responds here to the three arguments Network-1 made in post-trial briefing below. *See* Appx5033-5036.

First, Network-1 argued that HP “narrow[ed]” the court’s construction of “from said main power source,” claiming HP required that the “main power source” supply the “low level current.” Appx5033-5034. The district court held “from said

main power source” is to have its plain meaning (Appx40)—that the current be *delivered from* the main power source. And Network-1’s own expert, Dr. Knox, testified that the “delivering” limitation means that the “low level current” must “originate” or be “generate[d]” at the “main power source.” Appx1722(111:1-8). The evidence accords with that plain meaning. For example, Dr. Davis testified that the PoE chips, not the main power source, are what “*deliver[]* the detection current[.]” Appx2233(50:8-13). Consistent with Dr. Knox, Mr. Dwelley confirmed that the detection currents “are actually *generated*” in the PoE chips. Appx2140(112:3-5) (emphasis added).

Second, Network-1’s expert did not testify that any accused HP product delivers detection current *from* the main power source. Even when Network-1’s counsel asked him directly whether “the [detection] current comes from the chip or from the main power supply,” Dr. Knox would not answer. Appx1965-1966(42:23-43:12). Instead, he drew an analogy that PoE chips restrict current as a faucet restricts water, apparently to suggest (without actually stating) that the PoE chips do not themselves generate the detection current. Appx1966(43:8-12). But this analogy simply ignores how the accused products work. Mr. Dwelley, an experienced PoE chip designer, explained that, unlike a faucet that restricts water generated somewhere upstream, the PoE chips themselves actually “generate” detection current.

Appx2140(112:3-22). Lacking any basis to contradict Mr. Dwelley, Dr. Knox's conclusory water faucet analogy cannot support a finding that the HP products meet the "delivering" limitation. *MobileMedia Ideas LLC v. Apple Inc.*, 780 F.3d 1159, 1172 (Fed. Cir. 2015) ("Conclusory statements by an expert, however, are insufficient to sustain a jury's verdict"); *Guile v. United States*, 422 F.3d 221, 227 (5th Cir. 2005).

Third, Network-1 relied on the deposition testimony of HP's invalidity expert, Dr. Neikirk, in which Neikirk opined on a hypothetical divorced from both the claim language and the operation of the accused products. Appx5035. Neikirk's deposition testimony was not before the jury, nor does it address how the accused products work. It therefore cannot be used on appeal to disturb the jury's verdict.

Finally, the Court should reject any argument by Network-1 that the "delivering ... from" limitation is not a basis to affirm because the district court did not reach this issue in its opinion on the post-trial motions. This Court "reviews a denial of a motion for a new trial after a jury trial for abuse of discretion, affirming on any basis that supports the verdict." *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1306 (Fed. Cir. 2006); *see also United States v. Roussel*, 705 F.3d 184, 195 (5th Cir. 2013).

B. The Challenged Constructions Are Correct.

Network-1 contends that the district court's constructions of "low level current" and "main power source" are erroneous and compel a new trial. But both con-

structions follow directly from the specification and should be affirmed. The evidence presented at trial further compels a finding of non-infringement under the correct construction of “low level current.” The construction of “main power source” is, on the other hand, irrelevant to the jury’s non-infringement finding, and thus even if this Court disagrees with the construction, it is not a basis for a new trial.

1. “Low Level Current.”

The asserted independent claims require delivering a “low level current” from the main power source to the access device. The district court construed “low level current” as requiring both an upper bound and a lower bound: “a non-data-signal current that is sufficient to begin the start up of the access device but that is not sufficient to sustain the start up.” Appx53-56. Network-1 argues this construction is erroneous because it requires a lower bound. *E.g.*, BB at 25-26.

a. Although Network-1 devotes more than twenty pages to this issue, the parties’ dispute over the construction of “low level current” is narrow. Critically, the parties agree that the ’930 specification informs the meaning of “low level current.” *See, e.g.*, BB at 27. This agreement is unsurprising given that the ’930 specification refers to its sole embodiment as the “present invention.” Appx330(2:21-25); *see, e.g., Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007). It is also undisputed that “low level current” has no established plain meaning. *Indacon, Inc. v. Facebook, Inc.*, 824 F.3d 1352, 1357 (Fed. Cir. 2016). To the

contrary, the subjective term “low” requires an objective standard derived from the ’930 specification. *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014).

What’s more, the parties agree on the passage of the ’930 specification that defines “low level current”:

The 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.*

Appx331(3:14-15). The parties agree that the blue clause limits “low level current,” imposing the agreed-upon *upper* bound. The only dispute is whether the *lower* bound (red) is also limiting, as the district court concluded.

The ’930 specification establishes that the upper and lower bounds are equally important to the only detection method disclosed in the patent. The specification states that a “low level current” is delivered to the access device, and the voltage drop on the return path is measured. Appx330-331(2:66-3:2). If the voltage drop exhibits a “varying voltage level,” the access device is determined to be able to accept remote power. Appx331(3:12-13). The only way that the ’930 specification describes causing that “varying voltage level” is by requiring that the “low level current” be between the upper and lower bounds—high enough to begin start-up, but not so high as to sustain it. Appx331(3:14-16). As HP’s expert Dr. Neikirk explained, the lower bound is critical to generating the “varying voltage level”—a “low

level current” that falls below this bound would produce a “fixed voltage drop.” Appx1068-1069(¶¶79-80). In the ’930 patent’s sole detection method, the “fixed voltage drop” (as opposed to a “varying voltage level”) would indicate that the access device cannot accept remote power even if, in fact, it can. *See* Appx331(3:7-11).

Network-1’s appellate challenges to the district court’s construction of “low level current” should be rejected.

First, while the parties agree the “reference point” for determining whether a current is “sufficiently” low is below the level needed to sustain start-up (*i.e.*, the upper bound of the district court’s construction) (BB at 26-29), Network-1 is incorrect that the term “low level current” requires only one “reference point”—that is, only an upper bound. Network-1 acknowledges that the purpose of the purported invention is to detect whether a device attached to a network can accept remote power. BB at 28. As described above, the only way the ’930 specification describes of accomplishing that purpose is for the “low level current” to have the lower bound recited in the district court’s construction—the current being sufficient to “begin start up.” Appx331(3:14-16). Indeed, while Network-1 has offered charts suggesting that the plain meaning of “low level current” even includes *zero* (BB at 25 & 32), it elsewhere admits that in the context of this invention the term must have

“some non-zero reference point” (BB at 34). So the only question is what that lower bound is, and the patent itself provides the answer that the district court adopted.

Second, Network-1 argues that its proposed construction is supported by the PTAB’s construction, which required only an upper bound. BB at 29-30. That argument should be rejected because the construction invoked by Network-1 was made under the “broadest reasonable interpretation” standard. *See* Appx374; Appx376. As the district court reasoned, Network-1’s reliance on the PTAB’s construction “does not account for the broader claim construction standard applied in IPR” (Appx31; Appx54-55), before the PTAB’s recent adoption of the *Phillips* standard, *see* 37 C.F.R. § 42.100(b).

Third, from the questionable premise that “[w]hat is true of investments and snacks is true of electric current,” Network-1 argues that the plain meaning of “low” precludes a lower bound. BB at 30-35. But again, the engineering context here—in particular, the ’930 specification—is what informs the meaning of “low level current.” Even if the plain meaning of “low” might not require a lower bound, the ’930 specification includes such a requirement. As such, the district court’s construction does not “rewrite” the asserted claims as Network-1 contends. *See* BB at 34. Rather, the district court’s construction acknowledges that the specification “is the single best guide to the meaning of a disputed term.” *Phillips v. AWH Corp.*, 415 F.3d

1303, 1315 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

Nor does the plain meaning of “low” preclude a lower bound. The sources that Network-1 cites at most state that gradable antonyms like “low” point in one direction, not that they preclude a boundary in that direction. *See* BB at 30-35. In other words, even if “low” points only in one direction, it does not *preclude* a lower boundary.

Fourth, Network-1 argues that courts “uniformly” construe terms with “low” without reference to a lower bound, asserting that it is unaware of any court “other than the district court here” that imposed a lower bound for claim terms that included the word “low.” BB at 35-39. But the *D-Link* and *Cisco* courts construed the very claim element at issue here consistently with the court below. Appx354; Appx5475-5476.

Other courts have also, based on the context of the cases before them, required a lower bound on claim terms including the word “low.” For example, in *Ansar Group, Inc. v. Medeia, Inc.*, No. 4:12-cv-0386, 2013 WL 4677954 (S.D. Tex. Aug. 30, 2013), the court construed “low frequency area” as “the energy in the heart rate power spectrum in a selected frequency range between .04 hertz [*i.e.*, the lower bound] and 0.15 hertz [*i.e.*, the upper bound].” *Id.* at *23; *see also Pure Techs. Ltd. v. Pressure Pipe Inspection Co.*, No. 3:05-CV-0336N, 2007 WL 5747073, at *5

(N.D. Tex. Dec. 4, 2007) (construing “low frequency ac” as “an electrical signal with voltage that rises and falls periodically between a maximum positive voltage and a maximum negative voltage of equal magnitude at a frequency between 20 and 2000 Hertz”).

Of the cases Network-1 cites, only three relate to technology remotely similar to that at issue here. But in all three cases, the constructions turned on facts specific to the intrinsic records—not on whether the word “low” precludes a lower bound.

- In *NexMed Holdings, Inc. v. Beta Technologies, Inc.*, the parties agreed that a passage of the specification of the patent at issue in that case, which imposed only an upper bound, not a lower bound, was “key” to construing “low DC voltage.” 2:06-CV-1014 TC, 2008 WL 2783522, at *4 (D. Utah July 16, 2008).
- Similarly, in *Freeny v. Apple Inc.*, the court construed “low power communication signals” by reasoning that “[t]he specification on several occasions refers to low power signals as those that do not communicate farther than a few hundred feet.” No. 2:13-CV-00361-WCB, 2014 WL 4294505, at *5 (E.D. Tex. Aug. 28, 2014).
- And in *T-Netix, Inc. v. Global Tel*Link Corp.*, the upper bound was not a result of claim construction—the claim *explicitly* recited the only boundary included in the court’s construction, *i.e.*, pass “frequencies below about 500 Hz.” No. 2:01-CV-189, 2003 WL 25782759, at *18 (E.D. Tex. Aug. 15, 2003).

The remaining cases that Network-1 relies on relate to completely different technology and, in any event, do not hold that the plain meaning of “low” precludes a lower bound. *See IXYS Corp. v. Advanced Power Tech., Inc.*, 301 F. Supp. 2d 1065, 1069 (N.D. Cal. 2004) (manufacturing processes for the “production of transistors and other semiconductor devices”); *ITP Interpipe, Inc. v. Technip Offshore*,

Inc., No. CA 05-0581-C, 2007 WL 327688, at *1 (S.D. Ala. Feb. 1, 2007) (“insulating technique for pipe-in-pipe assemblies”); *ERBE Elektromedizin GmbH v. Canady*, 512 F. Supp. 2d 297, 300 (W.D. Pa. 2007) (“flexible endoscopic probes for argon plasma coagulation”) (footnote omitted); *Input/Output, Inc. v. Sercel, Inc.*, No. 5:06CV236, 2007 WL 6196070, at *7 (E.D. Tex. Dec. 19, 2007) (electrical and mechanical springs); *Agere Sys. Inc. v. Atmel Corp.*, No. CIV.A. 02-864, 2003 WL 21652264, at *1 (E.D. Pa. May 27, 2003) (“processes for fabricating a semiconductor integrated circuit” and “a particular metal frame structure for packaging semiconductor integrated circuits”); *Agere Sys., Inc. v. Broadcom Corp.*, No. CIV.A.03-3138, 2004 WL 1658530, at *17 (E.D. Pa. July 20, 2004) (wireless communications); *ArcelorMittal Fr. v. AK Steel Corp.*, 700 F.3d 1314, 1317 (Fed. Cir. 2012) (“boron steel sheet with an aluminum-based coating applied after rolling the sheet to its final thickness”) (“*ArcelorMittal I*”); *Am. Seating Co. v. USSC Grp., Inc.*, 91 F. App’x 669, 670 (Fed. Cir. 2004) (non-precedential) (wheelchair restraint system and a vandal-resistant bus seat).

Fifth, Network-1 asserts that the lower bound is incompatible with the purported invention of the ’930 patent. BB at 42-44. Network-1 argues that the purpose of “keeping the current level ‘low’” is to avoid starting up “all components” of the access device, and imposing a lower bound would run contrary to this purpose. *Id.* But the district court’s construction already addresses this concern—the district

court required that the “low level current” be sufficient to “begin” start-up—not that it be sufficient to “start up all components,” as Network-1 suggests. *See* Appx34-35.

Although Network-1 does not explicitly propose an alternative construction with a lower bound, it suggests the lower bound should be phrased “begin the start up of one *component*,” rather than “begin the start up of the access device.” BB at 43. The “one component” language is incorrect. In the ’930 specification, the “low level current” does not begin start-up of just *any* component. In describing the “present invention,” the ’930 specification states that the low level current causes one particular component, “the remote power supply[, to] begin[] to start up but the low current level is unable to sustain the start up.” Appx331(3:14-16). When the low level current begins to start up the remote power supply, the supply creates a distinct waveform, a “‘sawtooth’ voltage level,” which is what identifies the equipment as “capable of accepting remote power.” Appx331(3:16-17, 3:24-27). In other words, it is the remote power supply—not simply any “one component”—that generates the “‘sawtooth’ voltage level” used to determine that an access device can accept remote power. Appx331(3:12-17).

Although the district court’s construction calls for beginning to start up the “access device,” rather than the device’s “remote power supply,” it is still correct. In the ’930 specification, when the remote equipment’s power supply begins to start

up, so too does the remote equipment itself. Appx1067(¶76). If this Court is inclined to modify the construction, the proper alternative language for the lower bound is “begin start up of the remote power supply.” The Court should affirm even under this modified construction. HP presented compelling evidence showing that the detection current does not begin start-up of a remote power supply in any access equipment. Appx2201-2202(18:14-19:20), Appx2208(25:10-15), Appx2225-2226(42:17-43:8), Appx2227(44:13-44:24) (testimony of HP’s expert Dr. Davis); Appx2143(115:2-15), Appx2144(116:5-12), Appx2156(128:13-20) (testimony of Mr. Dwelley); Appx2048(20:5-7) (testimony of Mr. Tremblay).

b. Overwhelming evidence at trial established that HP’s detection current (the alleged “low level current”) cannot begin start-up of the access device and, therefore, is not a “low level current” under the district court’s (correct) construction.

HP’s non-infringement expert, Dr. Davis, testified that the voltage of the detection currents is, at most, 10 volts, Appx2221(38:10-16), whereas at least 30 volts are needed before the access device will allow power to be sent to the “operational circuitry,” and thereby begin start-up of the access device, Appx2227(44:19-24). As a result, the PoE+ switches do not deliver a “low level current.” Appx2227-2228(44:25-45:1).

Network-1 contends that it presented evidence establishing that the detection currents begin start-up of the access device. *See* BB at 70. However, its unexplained string citation does not support its argument.

Network-1 first cites about fourteen pages of testimony of its expert Dr. Knox (Appx1795-1808(55:15-68:12)), but in that testimony Dr. Knox based his opinion on his assertion that “[s]ome components” will “consume power” when exposed to the detection currents. *See, e.g.*, Appx1798(58:5-8). “Consuming power” is not a basis for determining whether or not an access device is “begin[ning] start up”—nearly any component will “consume power” when a current runs through it. Indeed, on cross-examination, Dr. Knox admitted that even a “copper wire” would consume some power when a current runs through it. Appx1985(62:4-20). Dr. Knox’s theory amounts to a repackaging of Network-1’s failed claim construction argument—under his theory, any current at all would be sufficient to “begin start up,” rendering the district court’s lower bound, as well as the disclosure in the specification on which it was based, a dead letter.

Network-1’s citations to Mr. Tremblay’s testimony are entirely consistent with the verdict of non-infringement. Appx2072(44:21-23) (“The detection [current] can never begin to start up or sustain that start up of an access device”); Appx2098-2099(70:20-71:4) (confirming that “during the detection phase” the “operational circuitry” does not “get used”). One citation (Appx2740) is to the first

page of a Texas Instruments datasheet, but Network-1 does not explain how, if at all, this datasheet establishes that the PoE+ switches meet the “low level current” limitation under the district court’s construction.

Finally, Network-1 cites the testimony of Messrs. Tremblay and Dwelley in what appears to be an attempt to show that the *amperage* of the detection current is larger than what would be needed to begin start-up. Appx2265(82:16-20); Appx2266 (83:12-18); Appx2140-2141(112:23-113:12). But what Network-1 leaves out is that immediately following the cited testimony, and consistent with Dr. Davis’s testimony, Mr. Tremblay conclusively states that the detection current cannot begin start-up of the access device “regardless of the current” because the *voltage* is insufficient: “the detection currents are associated with voltage ranges between 2.8 and 10, and that is not sufficient to begin the start up of the access device, regardless of the current.” Appx2266-2267(83:19-84:1).

In sum, the district court properly construed “low level current,” and the evidence presented at trial required the jury to find that the accused PoE+ switches do not meet this limitation as construed.

2. “Main Power Source.”

Asserted independent claims 6, 20, and 22 all recite a “main power source,” which the district court construed as “a DC power source.” Appx50-51. Network-

1 argues that the district court's construction is erroneous because it excludes "AC power sources." BB at 45.

a. In its only reference to the type of power received by the access device, the '930 specification refers to a "dc-dc switching supply." Appx331(3:12-13). As HP's expert Dr. Neikirk explained in his claim construction declaration, the reference to DC power is no accident. Dr. Neikirk opined that "in order for the 'main power source' to provide operational power to the data node, a POSITA would understand that the power must be DC, rather than AC." Appx1049(¶35). The disclosure of the '930 patent "certainly" did not, according to Dr. Neikirk, contemplate "a network device to operate using AC power directly from, e.g., an AC wall socket." Appx1049(¶36). If the access device were to receive AC power "the device would likely either fail to function" or "would be damaged because its circuitry was not designed to handle AC power." Appx1049(¶36). A POSITA would also understand that, if the main power source was providing AC current, the system would not be able to detect the "varying voltage," which is critical to the '930 patent's sole detection method. Appx1049-1050(¶37). A POSITA would therefore understand that the "main power source" providing AC current would be "inconsistent with the teachings of the specification." Appx1050(¶37).

b. Network-1's appellate challenges to the district court's construction of "main power source" should be rejected.

Network-1 cites various sources as evidence of the supposed plain meaning of “main power source.” BB at 45-50, 54-55. But none of these sources establishes what “main power source” means in the context of the ’930 specification. These arguments are therefore not responsive to the district court’s reasoning that “the ’930 Patent uses the term ‘main power source’ in a specific context and should be construed within that context.” Appx31. Similarly, in the IPR testimony that Network-1 quotes (BB at 55), HP’s expert did not testify as to how a POSITA would understand “main power source” in view of the ’930 specification—he testified as to what functions “main power source” performs in the claims (Appx514(113:6-20)) and what is the “ordinary meaning” of “main power source” (Appx515(114:2-8)).

Yet Network-1 also asserts that the ’930 specification confirms that “main power source” should not be limited to DC power sources. BB at 51-56. That argument is refuted by the ’930 specification’s teaching that the “low level current” is delivered from the main power source to the dc-dc switching supply (Appx330(2:52-57) and its description of a “dc-dc switching supply” (Appx331(3:12-13)). As Dr. Neikirk explained, the ’930 specification confirms that the “main power source” is a DC power source (Appx1049-1050(¶37)) because, unsurprisingly, a “dc-dc switching supply” must receive DC current (*see* Appx1056(¶51)). Thus, the presence of the dc-dc switching supply further confirms that the main power source must

output DC current. The assertion in Network-1's appellate brief that the '930 specification does not "prove anything about the main power source" (BB at 52) is wishful thinking.

Indeed, Network-1 elsewhere seemingly acknowledges that the detection method described in the '930 specification requires a DC power source, but argues that this description is merely a "preferred embodiment," and that other embodiments could operate with AC power. BB at 53-54, 60-65. But the embodiment described in the '930 specification is not merely a "preferred embodiment"; the '930 specification describes this embodiment as the "present invention." Appx330(2:21-23). Nor does the '930 specification include any phrases that would indicate that the purported inventor had possession of anything other than what is described in the '930 specification. *Cf. Cont'l Circuits*, 915 F.3d at 797.

Network-1 complains that the district court erred in invoking the "maxim" that constructions that render a claim inoperable should be disfavored. BB at 56-60. But Dr. Neikirk's declaration amply explained the inoperability problem. In any event, the court also relied on the reasoning set forth in the *Cisco* court's claim construction order and Dr. Neikirk's other opinions—both of which establish that construing "main power source" to encompass AC power sources would be *inconsistent* with the specification. *See* Appx30-31. Accordingly, the court's reference to the

inoperability canon is at most harmless error that cannot, and does not, justify granting a new trial. *ArcelorMittal I*, 700 F.3d at 1320 (reasoning that where “the specification is not consistent” with a disputed term’s plain meaning, the district court erred by holding that the plain meaning controls).

Network-1 further points to claim 17, contending that claim differentiation between it and claim 6 shows that “main power source” must encompass AC power sources. BB at 50-51. But while claim 6 is an original claim (Appx331(4:49-67)), claim 17 is a new claim added in the ’401 Reexamination (Appx334(1:45-46)). Network-1’s argument therefore should be rejected because “this Court has refused to use later-issued claims to determine the scope of earlier-issued claims.” *Advanced Media Networks, LLC v. AT&T Mobility LLC*, 748 F. App’x 308, 315 (Fed. Cir. 2018) (non-precedential) (citing *ArcelorMittal Fr. v. AK Steel Corp.*, 786 F.3d 885, 889 (Fed. Cir. 2015) (“*ArcelorMittal II*”). The doctrine of claim differentiation is simply inapplicable here.

c. The construction of “main power source” is entirely irrelevant to the jury’s non-infringement finding. In an attempt to establish the requisite prejudice, Network-1 argues that limiting “main power source” to DC power sources precluded Network-1 from identifying an “AC input,” “AC power source,” and an “AC wall plug outlet” as meeting this claim element. BB at 68-69. But these “AC” terms are merely generic labels—Network-1 has not identified any *specific AC component* in

the PoE+ switches that it would have pointed to as meeting the “main power source” limitation.

Moreover, through its reference to an “AC wall plug outlet” (BB at 68) Network-1 suggests that it would have identified elements *separate from* of the PoE+ switches and not supplied by HP. Indeed, in the photograph (below) that Network-1 provides as allegedly illustrating a configuration in which an AC power source serves a “main power source,” the AC power source is separate from the switch. BB at 65. But Network-1 has not set forth an infringement theory that would hold HP liable for elements separate from the accused PoE+ switches.

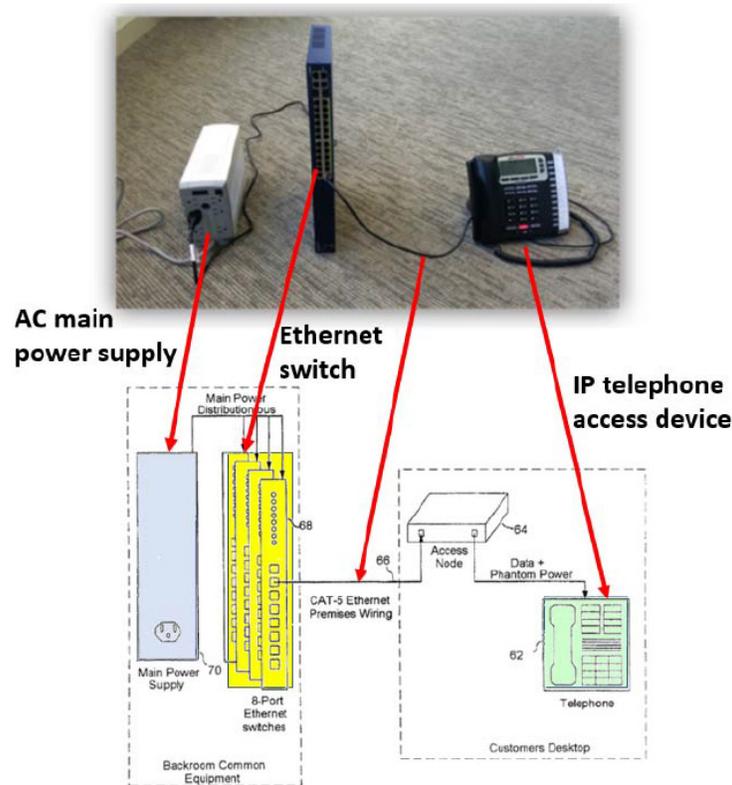


Fig. 3

At the end of the day, Network-1 cannot establish either prejudice from or clear error in the evidence-based construction of “main power source.” Weighing the expert testimony presented by the parties, the magistrate judge credited Dr. Neirkirk’s explanation that a POSITA would understand the “main power source” to be a DC power source; and based on Dr. Neirkirk’s testimony, the district court correctly rejected Network-1’s arguments that “main power source” could encompass an AC power source. Appx30-31; Appx50-51. Network-1 does not even mention, let alone challenge, Dr. Neirkirk’s testimony on appeal. It therefore has not carried its burden of showing clear error. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 835 (2015).

* * *

The judgment of non-infringement should be affirmed, either because it is supported by compelling evidence irrespective of the constructions challenged by Network-1 or because those constructions are correct.

II. The Asserted Claims Are Invalid (HP’s Cross-Appeal).

The district court erred in overriding the jury’s verdict of obviousness and entering a judgment that the ’930 patent is not invalid. The district court separately erred in refusing to invalidate the asserted claims on the basis of the amendments during reexamination, which constituted impermissible broadening.

A. The District Court Erred In Setting Aside The Obviousness Verdict.

Although the jury correctly found the asserted claims obvious in light of a prior art combination, the district court incorrectly set aside that verdict on the ground that HP was estopped from asserting that combination under 35 U.S.C. § 315(e)(2).

1. The AIA’s IPR Estoppel Provision.

The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”) draws from doctrines that courts have long applied to minimize duplicative adjudication—thereby minimizing the expense and vexation for the parties, conserving judicial and administrative resources, and reducing the likelihood of inconsistent decisions—while preserving litigants’ rights to have their claims and defenses heard and resolved on the merits. Two of these doctrines are joinder and estoppel.

In federal court “joinder of claims, parties and remedies is strongly encouraged.” *United Mine Workers of Am. v. Gibbs*, 383 U.S. 715, 724 (1966). The Federal Rules of Civil Procedure explicitly provide for joinder of claims (Rule 18) and parties (Rules 19 and 20), and both originally named parties and those joined to a case have the right to assert nearly any claim in a pending action. *See, e.g.*, 6A Charles Alan Wright *et al.*, *Federal Practice & Procedure* § 1585 (3d ed. 2015).

The AIA’s framework for managing the “[r]elation to other proceedings or actions” for IPRs, set forth in 35 U.S.C. § 315, is somewhat different. Section 315 provides, for example, that an IPR cannot be instituted based on an IPR petition “filed more than 1 year after the date on which the petitioner ... is served with a complaint alleging infringement of the patent.” 35 U.S.C. § 315(b). But there is one important exception to that time-bar: it does not apply to “a request for joinder under subsection (c).” *Id.* As a result, after the one-year bar has expired, requests to join a pending IPR are often the only mechanism available to a party to challenge a patent in IPR. But in contrast to cases governed by the Federal Rules, which give parties broad rights to join both claims and parties, Section 315 provides that the ultimate decision on joinder is left to the Director’s discretion.

The common-law doctrine of collateral estoppel “bars ‘successive litigation of an issue of fact or law actually litigated and resolved in a valid court determination essential to the prior judgment,’ even if the issue recurs in the context of a different claim.” *Taylor v. Sturgell*, 553 U.S. 880, 892 (2008) (quoting *New Hampshire v. Maine*, 532 U.S. 742, 748 (2001)). Yet, the application of collateral estoppel is “subject to due process limitations” (*id.* at 891), and “[d]ue process requires that there be an opportunity to present every available defense.” *Lindsey v. Normet*, 405 U.S. 56, 66 (1972) (quoting *Am. Sur. Co. v. Baldwin*, 287 U.S. 156, 168 (1932)). Common law collateral estoppel therefore only bars parties as to “matters that they have had

a full and fair opportunity to litigate.” *Montana v. United States*, 440 U.S. 147, 153 (1979). And although collateral estoppel can bar a party from litigating an issue in Article III district court based on a prior adjudication before an administrative agency, the “ordinary elements” of collateral estoppel still must be met. *B & B Hardware, Inc. v. Hargis Indus., Inc.*, 135 S. Ct. 1293, 1310 (2015).

The AIA includes its own “Estoppel” provision, which provides that a petitioner in an IPR is estopped from later asserting invalidity on any ground that it “raised or reasonably could have raised during that inter partes review”:

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), or the real party in interest or privy of the petitioner, may not assert either in a civil action arising in whole or in part under section 1338 of title 28 or in a proceeding before the International Trade Commission under section 337 of the Tariff Act of 1930 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) (emphasis added). This provision does not speak specifically to parties who join IPR proceedings (rather than those who file the petition based on which review was originally instituted).

In *Shaw Industries Group, Inc. v. Automated Creel Systems, Inc.*, 817 F.3d 1293 (Fed. Cir. 2016), this Court held that estoppel does not apply to grounds included in the original IPR petition but on which the PTAB does not institute review. Applying *Shaw*, this Court has also held that statutory IPR estoppel does not attach

to petitioned, non-instituted grounds because those grounds “could not be raised in the IPR.” *HP Inc. v. MPHJ Tech. Inv., LLC*, 817 F.3d 1339, 1347 (Fed. Cir. 2016). As the court below noted, district courts are divided on how to apply *Shaw* in various scenarios. Appx90 (citing cases); *see also, e.g., SiOnyx, LLC v. Hamamatsu Photonics K.K.*, 330 F. Supp. 3d 574, 602 (D. Mass. 2018) (suggesting that, in light of *SAS Institute v. Iancu*, 138 S. Ct. 1348 (2018), the question of petitioned but non-instituted grounds will no longer arise with respect to the original petitioner).

This appeal presents a recurring problem that is not resolved by *Shaw* (and does not even implicate the district-court conflict identified by the court below): When is a litigant that joins a previously instituted IPR after the one-year period has passed estopped from presenting in district court litigation grounds that were not presented by the original petitioner or instituted by the PTAB?

2. HP Is Not Estopped By The Avaya IPR.

The court below misapplied the AIA’s administrative estoppel provision in two ways. First, while Section 315(e)(2) limits estoppel to grounds that were “raised or reasonably could have been raised during [the IPR],” the ground presented at trial was neither raised nor reasonably could have been raised in HP’s petition seeking joinder with the ongoing Avaya IPR. Second, Section 315(e)(2) estoppel attaches only to claims on which an IPR was instituted, yet the district court ruled that HP

was estopped from challenging claims that were not part of (and did not even exist during) the Avaya IPR.

a. Ground Not Raised.

No estoppel attaches to the prior art presented to the jury at trial unless HP “raised or reasonably could have raised” the Fisher Patents Ground during the Avaya IPR that HP joined. 35 U.S.C. § 315(e)(2). HP did not raise the Fisher Patents Ground during the Avaya IPR. The Fisher Patents Ground consists of the Fisher Patents, the Chang Patents, and Woodmas. The Avaya IPR did not include any of these prior-art references. The PTAB instituted the Avaya IPR solely on two materially different references: Matsuno and De Nicolo. Therefore, the “raised” clause of Section 315(e)(2) did not estop HP from asserting the Fisher Patents Ground at trial. *See Shaw*, 817 F.3d at 1300.

That leaves the question whether HP “reasonably could have raised” the Fisher Patents Ground during the Avaya IPR. The answer is “no,” both because joining parties are rarely permitted to add new grounds in general and because HP was denied from doing so in connection with the Avaya IPR in particular. HP could not have reasonably raised the Fisher Patents Ground during the Avaya IPR, so no estoppel should attach to that ground.

Because HP filed its petition after the one-year bar date, HP filed the petition pursuant to the joinder exception in 35 U.S.C. § 315(c). As noted above, that provision gives the Director discretion over whether to join a party to an ongoing IPR. *See* 35 U.S.C. § 315(c). The PTAB recently resolved a split among the PTAB judges as to whether Section 315(c) permits issue joinder (e.g., adding grounds to a pending IPR). *See Proppant Express Invs., LLC v. Oren Techs., LLC*, IPR2018-00914, Paper 38 (PTAB Mar. 13, 2019) (“*Proppant*”). In *Proppant*, the PTAB’s Precedential Opinion Panel (“POP”), which includes the Director, held that although Section 315(c) permits issue joinder, particularly for otherwise time-barred parties, that the PTAB will “exercise this discretion *only in limited circumstances*—namely, where fairness requires it and to avoid undue prejudice to a party,” e.g., “the late addition of newly asserted claims” in a co-pending litigation. *Id.* at *19.

As expressed in *Proppant*, the PTAB’s reluctance to add new grounds or issues to instituted IPRs is consistent with how the PTAB has viewed issue joinder in the past. *See, e.g., Harmonix Music Sys., Inc. v. Princeton Digital Image Corp.*, IPR2015-00271, Paper 15 at *10 (PTAB June 2, 2015).

Beyond the fact that the PTAB rarely grants joinder of new issues, the specific facts of this case show that HP could not have reasonably raised the Fisher Patents Ground during the Avaya IPR. In its joinder petition, HP *tried* to add new grounds, but the PTAB rejected them. A series of PTAB decisions makes it clear that the

PTAB did not allow HP, as a joining party, to present *any* ground of invalidity not previously instituted in the Avaya IPR proceeding.

The PTAB instituted the Avaya IPR on two grounds: (1) claims 6 and 9 being anticipated by Matsuno and (2) claims 6 and 9 being obvious over De Nicolo and Matsuno. Appx373. After the Avaya IPR was instituted, two separate petitions were filed, each with a motion seeking joinder with the Avaya IPR. The first petition, filed by HP and others, included not only the instituted grounds in the Avaya IPR, but also additional grounds. Appx5448-5451. The second petition, filed by Dell, was limited to the grounds on which the PTAB instituted the Avaya IPR. Appx5415.

The PTAB granted Dell's request for joinder and institution on its IPR petition. Appx5431; Appx5442. In granting Dell's joinder request, the PTAB panel reasoned that "Dell's Petition *raises no new issues* beyond what is already before the [PTAB] in the [Avaya IPR], which weighs in favor of granting the motion." Appx5439 (emphasis added).

On the same day that the PTAB granted Dell's joinder request, the same PTAB panel denied HP's joinder request. Appx5463. In denying the HP's joinder request, the PTAB panel emphasized that HP's petition "*raises numerous substantive issues* that are not before the [PTAB] in [the Avaya IPR]." Appx5460 (emphasis added). At the same time, the PTAB refused to analyze the substance of these new grounds. Appx5451-5452; Appx5459-5463.

Only after HP limited its joinder request to the grounds previously instituted in the Avaya IPR did the PTAB permit HP to participate in the Avaya IPR. And in granting HP's second joinder request, the PTAB reasoned that the accompanying petition "*raises no new issues* beyond those already before the Board in the [Avaya IPR], which weighs in favor of joinder." Appx5175 (emphasis added).

Thus, the PTAB made it clear that it would not permit HP to add new grounds to the ongoing Avaya IPR. And the PTAB refused to consider the substance of the proposed new grounds. As a result, HP could only participate in the Avaya IPR by limiting its grounds to those already instituted in the Avaya IPR—grounds that Avaya chose. Under these circumstances, HP could not have reasonably raised different grounds, including the Fisher Patents Ground, in the Avaya IPR. The only grounds HP raised and could have raised during the Avaya IPR are those grounds on which the Avaya IPR was instituted. Because the Fisher Patents Ground was not one of the instituted grounds, Section 315(e)(2) did not estop HP from raising that ground at trial.

This result is required by the Due Process Clause. If Section 315(e)(2) were construed to estop HP in these circumstances from asserting the Fisher Patents Ground, that application of estoppel would be unconstitutional because HP has never been given "a full and fair opportunity to litigate" obviousness regarding the asserted claims. *See Montana*, 440 U.S. at 153.

In reaching the opposite conclusion, the district court cited *Parallel Networks Licensing, LLC v. IBM Corp.*, No. 1:13-cv-2072, 2017 WL 1045912, at *12 (D. Del. Feb. 22, 2017). Appx91. But unlike HP, the petitioner in *Parallel Networks* made no effort to raise new grounds together with its joinder motion. 2017 WL 1045912, at *12. As established above, the PTAB rebuffed HP's attempt to raise new grounds and limited HP to only those grounds that were previously instituted in the Avaya IPR. In the context of *this* case, it is clear that HP could *not* have reasonably raised grounds different from those already instituted in the Avaya IPR.

Finally, the district court reasoned that allowing HP to assert the Fisher Patents Ground in this case would frustrate the “litigation efficiencies the AIA was designed to produce and would call into question this Court’s decision to stay this case pending IPR.” Appx88. But the district court’s decision to stay the case pending the IPR was the result of an unopposed motion—the district court did not condition the stay on future applications of estoppel. Appx5043. Indeed, the district court entered the stay before HP filed any IPR petition. And the litigation efficiencies that may be gained through the application of the IPR estoppel statute must yield to the due process requirement that HP be afforded “an opportunity to present every available defense” (*Lindsey*, 405 U.S. at 66), which under the Patent Act includes obviousness. 35 U.S.C. § 282(b). Estopping the original petitioner as to all grounds that it reasonably could have included in its petition may promote litigation efficiency

while still affording the original petitioner due process because, under the AIA, “it’s the petitioner ... who gets to define the contours of the proceeding.” *SAS*, 138 S. Ct. at 1355. But that does not apply to HP because it had no practical say as to the grounds the PTAB considered in the Avaya IPR.

b. Claims Not At Issue.

Section 315(e)(2) estops a “petitioner in an inter partes review of *a claim*” from asserting that “*the claim* is invalid” (emphases added). This Court has therefore held that “[t]here is no IPR estoppel with respect to a claim as to which no final written decision results.” *Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1052 (Fed. Cir. 2017). That principle applies here.

The Avaya IPR that HP joined challenged *only* claims 6 and 9 of the ’930 patent. Appx372 (Final Written Decision). Claims 13, 14, 17, 20, and 22 were not part of the Avaya IPR, nor could they have been because they did not exist during the Avaya IPR. Claims 13, 14, 17, 20, and 22 were added to the ’930 patent *after* the PTAB issued its Final Written Decision in the Avaya IPR. *See* Appx334 (Reexamination Certificate listing claims 13, 14, 17, 20, and 22); Appx372 (Final Written Decision). Thus, no estoppel can apply to claims 13, 14, 17, 20 and 22.

This result is also required by the Due Process Clause. If Section 315(e)(2) estopped HP from presenting invalidity defenses in district court against claims that

did not even exist at the time of the IPR, that application of estoppel would be unconstitutional because HP would not be given “a full and fair opportunity to litigate” obviousness regarding those claims. *See Montana*, 440 U.S. at 153.

Therefore, independent of the district court’s erroneous application of estoppel to the Fisher Patents Ground, the district court erred in attaching estopping to claims 13, 14, 17, 20, and 22.

3. Substantial Evidence Supports The Invalidity Verdict.

At trial, HP presented two alternative theories of invalidity through the testimony of its expert Dr. Neikirk: the “Fisher Patents Ground” and the “Fisher System Ground.” *See, e.g.*, Appx2349(27:16-21). The jury found that HP had demonstrated that all of the asserted claims were invalid as obvious and indicated its finding on a general verdict form. Appx71. Under the general verdict rule, the jury’s verdict should be upheld if there is sufficient evidence to support either theory. *Cordance Corp. v. Amazon.com, Inc.*, 658 F.3d 1330, 1339 (Fed. Cir. 2011).²

Network-1 waived any challenge to the sufficiency of the evidence presented to the jury on obviousness as it failed to raise any such challenge in its pre-verdict motion under Rule 50(a) of the Federal Rules of Civil Procedure. *Flowers v. S. Reg’l*

² The district court ruled on JMOL that HP did not establish by clear and convincing evidence that the Fisher System was in public use and did not adequately corroborate Dr. Fisher’s testimony. Appx83; Appx87. HP is not challenging these rulings on appeal.

Physician Servs. Inc., 247 F.3d 229, 238 (5th Cir. 2001) (“If a party fails to move for judgment as a matter of law under Federal Rule of Civil Procedure 50(a) on an issue at the conclusion of all of the evidence, that party waives both its right to file a renewed post-verdict Rule 50(b) motion and also its right to challenge the sufficiency of the evidence on that issue on appeal”); *i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 845 (Fed. Cir. 2010), *aff’d*, 564 U.S. 91 (2011). In its Rule 50(a) motion, Network-1 raised four specific arguments: (1) evidence of public use of the Fisher System, (2) corroboration of Dr. Fisher’s testimony, (3) IPR estoppel, and (4) HP’s “entire validity case” should be rejected because its expert allegedly admitted nonobviousness. Appx2501-2502(179:21-181:3). Network-1 never provided any indication that it was challenging whether the references of the Fisher Patents Ground taught any elements of the asserted claims or whether a POSITA would have been motivated to combine those references.

In any event, the jury’s verdict of invalidity is supported by substantial evidence. The jury heard testimony from Dr. Neikirk establishing that the combination of references in the Fisher Patents Ground meets all of the limitations of the asserted claims and that a POSITA would have had a motivation to combine these references. Moreover, Dr. Neikirk’s testimony considered all four factors articulated by the Supreme Court for evaluating obviousness under Section 103. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

The Fisher Patents Ground includes three sets of prior art references: the Fisher Patents (including Fisher '998), the Chang Patents (including Chang '885), and Woodmas. At trial, Dr. Neikirk explained each of these sets of references and how they relate to the requirements of the asserted claims.

Fisher '998 (Appx5366-5379). As Dr. Neikirk testified, the system described in Fisher '998 was a “foundational [PoE] system.” Appx2356(34:7-9). Fisher '998 describes a system in which an “[e]lectrical supply current, sufficient to power a wireless access point, is transmitted concurrently with a network data signal across a transmission line.” Appx5367(Abstract). As illustrated in Figure 2 of Fisher (below), the system includes, among other things, “a power cable 120, a hub 240, a data cable 130, a power and data coupler 110, a network cable 160, a wireless access point 200, and a number of remote nodes.” Appx5374(4:27-29).

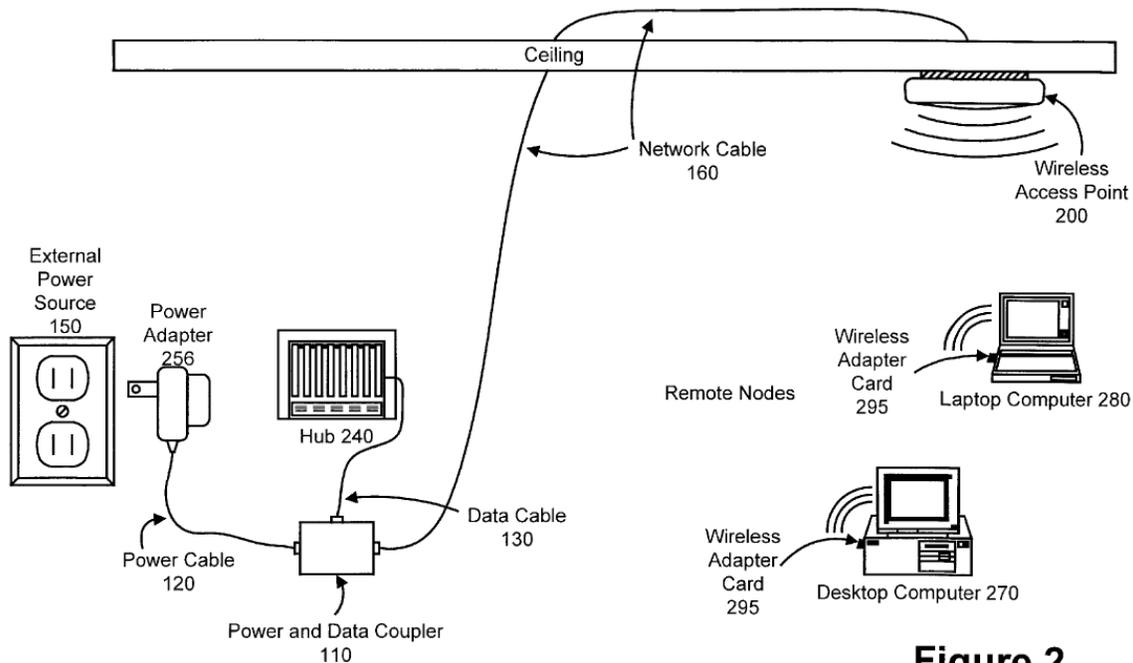


Figure 2

Dr. Neikirk further testified that hub 240 teaches “a data node adapted for data switching” (see Appx2348(26:7-12)), wireless access point 200 teaches an “access device adapted for data transmission” (see Appx2348(26:15-20)), network cable 160 teaches a “data signaling pair connected between the data node and the access device and arranged to transmit data therebetween” (see Appx2348(26:3-6)), and power and data coupler 110 teaches a “main power source connected to supply power to the data node” (see Appx2348-2349(26:17-27:5)).

Chang '885 (Appx5345-5364). *Chang '885* teaches networking systems that include “network hubs and network interface adapters for automatically and continuously detecting the presence of a remote adapter coupled to a network twisted-pair cable, providing electrical power from a network hub to the remote adapter via the

network twisted-pair cable.” Appx5357(1:8-12). Figure 2 of Chang ’885 (below) shows a network hub 202 that “provide[s] the electrical power to the detected device when the presence of the detected device is confirmed.” Appx5358(4:50-53). Chang further teaches that the network hub can include “device presence detectors” 414, which in turn include an electrical power supply 640. Appx5360(8:6-13); Appx5362(11:43-46). Electrical power supply 640 supplies power to a remote adapter when the presence of the remote adapter is detected based on sensed voltages. Appx5362(11:37-46). In particular, Dr. Neikirik testified that the “presence detector” controls the power supplied to the remote adapter based on whether it determines that the device can accept remote power. Appx2351-2352(29:20-30:4).

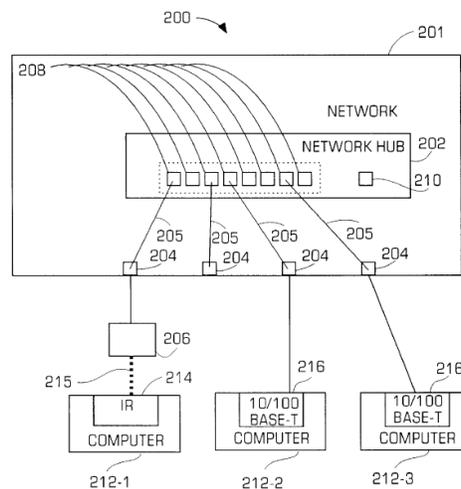


FIGURE 2

Thus, Chang ’885 teaches a “secondary power source” (electrical power supply 640) that is “arranged to supply power from the data node via said data signaling pair to the access device,” and also teaches the steps of “sensing a voltage level on

the data signaling pair,” and “controlling power supplied by said secondary power source to said access device in response to a preselected condition of said voltage level,” as required by claim 6.

Woodmas (Appx5245-5258). Dr. Neikirk testified that Woodmas teaches a system in which a “control station” communicates with a “camera.” Appx2353(31:7-10). To perform “presence detection,” Woodmas teaches that the control station applies a “low-power output” to the cable between the control station and the camera. Appx2353(31:14-17). Inside the camera is a “voltage controlled oscillator” that, if present, “sends back a signal” to the control unit. Appx2353(31:18-23). If the control station receives that signal, it “applies full operating power.” Appx2353(31:21-23). As Dr. Neikirk further testified, the “limited power” applied by the control unit is only sufficient to begin start-up of the camera (via the voltage controlled oscillator) it is not sufficient to sustain start-up, and thus teaches a “low level current.” Appx2354-2355(32:18-33:7).

Dr. Neikirk testified that a POSITA would have had a bachelor’s degree in electrical engineering or an equivalent field. Appx2338(16:19-12); Appx2339(17:1-3). He further testified that, based on the testimony of Network-1’s CEO Corey Horowitz and Dr. Fisher, detection methods were “well-known in the late 1990s.” Appx2339(17:12-16). Indeed, even Network-1’s expert Dr. Knox admitted that the ’930 patent did not invent PoE detection methods. Appx1863(123:2-6). Dr. Neikirk

applied this understanding in explaining why a POSITA would have been motivated to combine Fisher '998, Chang '885, and Woodmas in a manner that meets the claims. For example, Dr. Neikirk testified that a POSITA would have been motivated to simplify the system described in the Fisher Patents to consolidate functionality in a hub. Appx2356(34:10-19). Chang '885, Dr. Neikirk continued, teaches how to accomplish that—it teaches “put[ting] everything in a hub,” making the system “simpler and more combined.” Appx2357(35:3-6). A POSITA would have also recognized, however, that “there’s still an issue” because the system described in Fisher '998 does not provide enough “pairs of wires” to implement the detection method described in Chang '885. Appx2357(35:7-14). A POSITA would therefore “look for something that can do it all over one pair which is Woodmas.” Appx2357(35:15-18). In incorporating Woodmas’s detection method, a POSITA would “take the power reception unit and put it out in the wireless access point.” Appx2357(35:19-22). Combining the Fisher Patents, the Chang Patents, and Woodmas in this manner would, according to Dr. Neikirk, yield a system that meets the asserted claims. Appx2358(36:3-5).

In brief, the jury was presented with more than sufficient evidence to support its obviousness finding. Accordingly, the Court should reverse the district court’s entry of judgment of no invalidity as to all claims to which estoppel does not apply.

B. Network-1 Impermissibly Broadened the Asserted Claims.

“A patentee is not permitted to enlarge the scope of a patent claim during reexamination.” *Creo Prods.*, 305 F.3d at 1344 (citing 35 U.S.C. § 305). The district court correctly invalidated claims 21 and 23 for improper claim broadening, and Network-1 does not challenge that ruling on appeal. Appx1165-1171; Appx46; Appx56; Appx5521-5523. But the district court erred in holding that Network-1 did not impermissibly broaden claim 6 and the other asserted claims. Appx57-59. On *de novo* review, this Court should hold that the asserted claims are invalid under Section 305.

As background, each independent claim recites a “secondary power source” (Appx331(4:57-59)), a term both the *D-Link* and *Cisco* courts construed before the ’930 patent’s *ex parte* reexamination began (*see* Appx348-352), and which the court below re-construed after the reexamination ended (Appx33). On appeal, Network-1 does not challenge the construction of “secondary power source.” In all three courts below, Network-1 argued that the “main power source” and “secondary power source” may be *one and the same power source*. Appx32; Appx349; Appx5473-5474. All three courts rejected Network-1’s argument, holding the “secondary power source must be *physically separate* from the main power source.” Appx33 (emphasis added); *see also* Appx352 and Appx5473-5474. That is, the “main power source” and “secondary power source” cannot be one and the same power source.

During reexamination, Network-1 effectively eliminated the “physically separate” requirement from the claims as thus construed, broadening them to cover a “main power source” and “secondary power source” that are *one and the same*. With the district court’s construction in force—including its “physically separate” requirement—Network-1 added in reexamination claims 15 and 16, both depending directly from claim 6. Claim 15 recites “the secondary power source is *the same source of power* as said main power source,” and claim 16 recites “said secondary power source is *the same physical device* as the main power source.” Appx334(1:39-44) (emphases added). By adding claims 15 and 16, Network-1 impermissibly broadened claim 6 because claims 15 and 16 have “the practical effect of expanding the scope of claim [6] to cover claim scope expressly rejected by a previous claim construction ruling.” *ArcelorMittal II*, 786 F.3d at 890.

The Court addressed nearly identical facts in *ArcelorMittal II*. There, after the district court construed independent claim 1 to require “steel with a tensile strength *greater than 1500 MPa*,” the patentee added new claim 23, which depended from claim 1 but recited “mechanical resistance ... in *excess of 1000 MPa*.” 786 F.3d at 887 (emphases added). This Court reasoned that new claim 23 had “the practical effect of expanding the scope of claim 1 to cover claim scope expressly rejected by a previous claim construction ruling.” *Id.* at 890. Not only was independent claim 1 broadened and invalidated, but so too were all claims depending

from claim 1 (claims 2-23) that did not include further limitations eliminating the broadening. *Id.*

Here, independent claim 6 and dependent claims 13, 14, and 17 (which depend from claim 6) are invalid for the same reason. After the district court ruled that the “secondary power source” “must be *physically separate* from the main power source,” Network-1 added dependent claims permitting the two power sources to be the “*same source of power*” (Appx334(1:39-41), emphasis added) or “the *same physical device*” (Appx334(1:42-44), emphasis added). As in *ArcelorMittal II*, new claims 15 and 16 have the “practical effect” of broadening—and therefore invalidating—independent claim 6 and dependent claims 13, 14, and 17. *See* 786 F.3d at 890.

Independent claims 20 and 22 are also invalid under Section 305. The parties agreed that “secondary power source” has the same meaning in each claim. But for Network-1’s broadening of claim 6, that construction would require the “main” and “secondary” power sources to be “physically separate” in claims 20 and 22, as discussed above. Yet, because Network-1 has broadened claim 6, the post-reexamination construction that applies to each of claims 6, 20, and 22 makes “physical separateness” optional. This result is driven by basic claim construction principles. *See In re Rambus, Inc.* 694 F.3d 42, 48 (Fed. Cir. 2012) (“unless otherwise compelled

... the same claim term in the same patent or related patents carries the same construed meaning.”) (omission in original). Accordingly, each asserted claim has been improperly broadened by the addition of dependent claims 15 and 16.

Network-1’s own conduct confirms that it impermissibly broadened these claims. Shortly after learning that HP would move the district court to invalidate claim 6 for improper broadening, Network-1 took the extraordinary step of filing a statutory disclaimer with the USPTO, disclaiming claims 15 and 16 from the ’930 patent. Appx5075. After disclaiming these claims, Network-1 argued they no longer exist, so they cannot broaden claim 6, in order to avoid invalidity under Section 305. Appx5061-5062. But that “effectively provides an end-run around” Section 305 and “is irreconcilable with the statute’s purpose.” *Rembrandt Wireless Tech., LP v. Samsung Elecs. Co.*, 853 F.3d 1370, 1381 (Fed. Cir. 2017). Network-1’s disclaimer cannot retroactively excuse Network-1’s violation of Section 305. As intrinsic evidence, claims 15 and 16 put the public on notice that the claims are not limited to physically separate power sources. Indeed, Network-1 cited claims 15 and 16 as intrinsic evidence in support of its broadened construction of “secondary power source.” Appx5542; Appx5581. The statutory disclaimer does not remove this intrinsic evidence from the public. *See Rembrandt*, 853 F.3d at 1384 (“our precedent and that of others courts have not readily extended the effects of disclaimers to situations where others besides the patentee have an interest that relates to the

relinquished claims”). All the disclaimer shows is that Network-1 tried to game the system: it added claims 15 and 16 solely to broaden claim 6, but then disclaimed those claims after learning its broadening tactic could invalidate the claims and undermine its licensing program. Appx5002(3:3-7, 3:16-21); Appx5003(4:1-10, 4:13-21).

The Court should not reward Network-1’s gamesmanship. Approving Network-1’s playbook would give patentees an avenue to avoid adverse claim constructions through reexamination rather than appellate challenge, by adding a dependent claim to undo a district court’s claim construction, and responding to a motion for improper claim broadening by statutorily disclaiming the dependent claim to eliminate any risk of invalidation under Section 305. This would not only render Section 305 effectively meaningless, but would also allow the patentee to expand its monopoly over products that would not have infringed when the patent originally issued. *ArcelorMittal II* provides the requisite disincentive to prevent that result and should be applied in the same manner here. Accordingly, each asserted claim is separately invalid for impermissible broadening.

* * *

The verdict of obviousness should be reinstated in its entirety, or at minimum with respect to all asserted claims other than independent claim 6—which (along with the other asserted claims) is also invalid for impermissible broadening.

CONCLUSION

For the foregoing reasons, the judgment of non-infringement should be affirmed and the judgment of no invalidity should be reversed.

Dated: March 29, 2019

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Mark A. Perry, hereby certify that I caused the foregoing to be filed via the Court's CM/ECF system and served on counsel of record who have registered for such service on March 29, 2019.

Dated: March 29, 2019

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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 28.1(e). This brief contains 16,073 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii) and Federal Circuit Rule 32(b).

2. This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Word 2013 in Times New Roman, 14-point.

Dated: March 29, 2019

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